1792A
EA-03-12
Brush Mtn.

June 3, 2003

Concerned Citizen,

The Upper Willamette Resource Area of the Eugene District Bureau of Land Management has completed the Environmental Assessment (EA) and Finding of No Significant (FONSI) for the Brush Mountain Timber Sale, a density management project, located in Sections 1 and 11, T. 22 S., R. 3 W., Will. Mer.

You have expressed an interest in receiving copies of Environmental Assessments for district projects. Enclosed is a copy of the Environmental Assessment for your review and any comments. Public notice of this proposed action will be published in the Eugene Register Guard on June 4, 2003. The EA will also be available on the internet at http://www.edo.or.blm.gov/nepa. The public comment period will end on July 7, 2003. Please submit comments to me at the district office, by mail or by e-mail at OR090mb@or.blm.gov by close of business (4:15 p.m.) on or prior to July 7, 2003. If you have any questions concerning this proposal, please feel free to call Don Wilbur at 683-6994.

Comments, including names and street addresses of respondents, will be available for public review at the district office, 2890 Chad Drive, Eugene, Oregon during regular business hours (7:45 a.m. to 4:15 p.m.), Monday through Friday, except holidays, and may be published as part of the EA or other related documents. Individual respondents may request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses and from individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for public inspection in their entirety.

Sincerely,

Emily Rice, Field Manager
Upper Willamette Resource Area

Enclosure

# BRUSH MOUNTAIN
# Timber Sale

## Upper Willamette Resource Area
## BLM Eugene District

## ENVIRONMENTAL ASSESSMENT
### Environmental Assessment No. 090 EA 03-12

**May 27, 2003**

**CONTENTS**

# Brush Mountain Timber Sale
## Upper Willamette Resource Area
## BLM Eugene District

## ENVIRONMENTAL ASSESSMENT
**Environmental Assessment No. OR 090-EA-03-12**

## 1.0 PURPOSE OF AND NEED FOR ACTION

The Bureau of Land Management (BLM) proposes to implement a density management project in the Upper Coast Fork of the Willamette and Mosby Creek watersheds. The proposed action is within the Matrix and Riparian Reserves (RR) land use allocations. The area of analysis is approximately 800 acres of BLM lands located in T. 22 S., R.3 W., Sections 1 and 11.

The purpose of this action, in part, is to help implement objectives on Matrix Areas as described in the Eugene District ROD/RMP (USDI 1995, Appendix E, p. 200). It directs that timber be harvested from Matrix lands to provide a sustainable supply of timer.

Purpose is to also help implement objectives on Riparian Reserve lands and the Aquatic Conservation Strategy (ACS) objectives. These objectives, which are described in the Northwest Forest Plan, must strive to restore and maintain the ecological health of watersheds and aquatic ecosystems on public lands. The Eugene District ROD/RMP (USDI 1995, p.24) states that BLM should "apply silvicultural practices for Riparian Reserves to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy Objectives." 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, (April 1994) says, "Active silvicultural programs will be necessary to restore large conifers in Riparian Reserves. Appropriate practices may include . . . thinning densely-stocked young stands to encourage development of large conifers . . . " (B-31).

The underlying need is the result of a review of timber stand exams, which show the stands to be uniform in structural condition and overstocked, causing reduced tree growth rates and stand vigor as competition increases. Harvest treatments would increase vigor, growth rates, crown differentiation and complexity, wind firmness and root structure. Additional specific benefits in the Riparian Reserves would be recruitment of diverse large diameter conifers and an increase in the diversity of species composition.

Specifically for the Brush Mountain proposed timber sale project, *needs* include the following forest health objectives:

- Increase the proportion of merchantable volume in the stand.
- Maintain good crown ratios and stable, wind-firm trees
- Harvest anticipated mortality of small trees.
- Accelerate development of trees that can later provide large diameter snags and down logs
- Improve and/or decommission existing roads in the harvest area.
- Improve diversity of species composition and stand density within Riparian Reserves.

### 1.1 Conformance

This environmental assessment (EA) is tiered to the *Record of Decision (ROD) for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl, April 1994, and the Eugene District Record of Decision and Resource Management Plan (RMP), June 1995 as amended by the Record of Decision (ROD) for Amendments to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines, January 2001*. The above referenced documents are available for review at the Eugene District Office of the BLM, Eugene, Oregon or on the internet at http://www.or.blm.gov/nwfp.htm.

The Analysis File contains additional information used by the interdisciplinary team (IDT) to analyze impacts and alternatives and is hereby incorporated by reference. These documents are available for review at the Eugene District Office of the BLM, Eugene, Oregon.

### 1.2 Monitoring

Monitoring guidelines are established in the 1995 RMP/ROD, Appendix D, and the 1994 Northwest Forest Plan Standards and Guidelines, pp. E-1 to E-10.

### 1.3 Scoping

The scoping process identified both agency and public concerns relating to the proposed projects, and defined the issues and alternatives that would be examined in detail in the Environmental Assessment. The public was informed of the planned environmental assessment through letters to those on the Resource Area's mailing list, and to those receiving the Eugene District Planning Update, *"Eye to the Future"*.

### 1.4 Issues

The Interdisciplinary Team (ID Team) brought forward concerns related to resources that had the potential of being affected by the proposed actions. All resource concerns were mitigated through the implementation of "Design Features" in **Appendix A**, and the application of Best Management Practices listed in the Eugene District ROD/RMP (Appendix C), so that none of the concerns were elevated to issues. The Critical Elements of the Human Environment were considered and are summarized in the Environmental Consequences Section 4.0.

## 2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

This section describes alternatives identified by the interdisciplinary team, alternatives eliminated from detailed study, and comparison of alternatives. Design features associated with these alternatives can be found in the appendices: **Appendix A** for Project Design Features, **Appendix B** for Harvest Area Details and Road Construction and Closure Summary, and **Appendix C** for maps of proposed harvest areas.

The terms “decommission” and “full decommission” are used frequently within this document. These terms are defined as follows:

**Full Decommission** - Roads determined through an interdisciplinary process to have no maintenance need may be subsoiled (or tilled), seeded, mulched, and planted to reestablish vegetation. Cross drains, fills in stream channels, and potentially unstable fill areas will be removed to restore natural hydrologic flow. The road will be closed with a device similar to an earthen barrier or equivalent. The road will not require future maintenance. This category also includes roads that have been closed due to a natural vegetation process.

**Decommission (long term > 5 years)** - These will be based on resource protection needs identified in watershed analysis and the RMP directives. The road segment will be closed to vehicles on a long-term basis, but may be used again in the future. Prior to closure the road will be left in an "erosion-resistant" condition by establishing cross drains, eliminating diversion potential at stream channels and removing fills on unstable areas. Exposed soils will be treated to reduce sedimentation. The road will be closed with a device similar to an earthen barrier or equivalent.

## 2.1 Alternative I – No Action

### 2.1.1 Timber Harvest Activity in the Matrix

No thinning would occur within the analysis area at this time. These stands would continue to develop along current trajectories.

### 2.1.2 Density Management within Riparian Reserves

No density management activities would occur within the analysis area at this time. These stands would continue to develop along current trajectories in a somewhat stagnate state. There would be very little increase in growth in the understory and over story of the Riparian Reserves. Development of late seral characteristics would progress at a slower rate.

### 2.1.3 Roads

Under this alternative, no temporary road construction, improvements or decommissioning to existing road system would occur.

### 2.1.4 Snag and Down Log Creation

Under this alternative, no snags or log creation would occur.

## 2.2 Alternative II – Proposed Action

### 2.2.1 Timber Harvest Activity in the Matrix

This alternative would conduct density management on two harvest areas of a combined acreage of approximately **375 acres** of Douglas-fir dominated forest. The treatment would reduce the number of trees from approximately 175 to 60 trees per acre on **6 acres** in harvest area #1 and from approximately 225 to 100 trees per acre on **369 acres** in harvest area #2. Trees selected for harvest would be from the suppressed, intermediate, and co-dominant crown classes.

A different density management prescription would be utilized for the Matrix in harvest area #1 because access to this area utilizes a temporary stream crossing. This would also apply to the riparian reserves in harvest area 1 (described in 2.2.2). Reducing stand density to 60 trees per acre would set stand development on a trajectory such that a subsequent harvest entry in two

decades would not likely be prescribed, and the temporary stream crossing would not be needed at that time.

Harvest would be accomplished with a combination of both cable and ground-based yarding systems. Cable yarding would be used on approximately **205 acres** and ground-based yarding would be used on **170 acres.** (see **Appendix A** for Design Features that address various harvesting systems, and silviculture prescription) see **Appendix B** for Harvest Area Details, Road Construction, and Closure Summary.

### 2.2.2 Density Management within Riparian Reserves

For both watersheds (Upper Coast Fork Willamette River, and Mosby Creek) perennial and intermittent non-fish bearing streams retain the interim Riparian Reserve width of one site potential tree height (200 feet slope distance) on each side of the stream channels. Fish bearing streams retain two site potential trees (400 feet slope distance) on each side of the stream channels.

Density management in Riparian Reserves is shown on the maps in Appendix C. All designated density management areas would have a riparian buffer width (no cut buffer) of approximately 75 feet or 150 feet. Harvest area 1 would reduce the number of trees from approximately 175 to 60 trees per acre on **32 acres**, and from 225 to 100 trees per acre on **166 acres** in harvest area 2.

This proposed action recommends density management in **198 acres** of Riparian Reserve. The stand age averages between 43 and 53 years. The density management prescription for the riparian reserve would be the same as the adjacent Matrix upland. Riparian reserve treatment would be a thinning from below, removing trees from the suppressed, intermediate and co-dominant crown classes.

There would be no ground based yarding equipment in the Riparian Reserves, except where designated on the map in "Appendix C" harvest area 1. In harvest area 1, skid roads would be placed no closer than 75' from the posted boundary in the Riparian Reserve. This would keep any yarding equipment 225' from the fish bearing stream #30 and 150' from the non-fish bearing stream #13.

Table 2.2.1 summarizes the Proposed Action, Alternative II.

**Table 2.2.1**

| HARVEST AREA | TYPE HARVEST | LAND USE ALLOCATION | PROPOSED ACRES TO BE HARVESTED | VOLUME (MBF) |
|---|---|---|---|---|
| 1 | Density Mgt. | Riparian Reserve | 32 | 486 |
| 1 | Thinning | Matrix | 6 | 91 |
| 2 | Density Mgt. | Riparian Reserve | 166 | 1925 |
| 2 | Thinning | Matrix | 369 | 4175 |
| | | TOTAL | 573 | 6677 |

MBF - Thousand Board Feet

### 2.2.3 Roads

Spurs M, A, F, O, P, and Q would require 0.85 miles of temporary road construction that would be decommissioned upon completion of harvest activities. Existing tractor trails would be used for portions of Spurs A, F, and Q.

Spurs M, B, D, F, G, I, J, K, L, and Q are existing tractor trails or native surfaced roads and will require temporary improvement of 1.72 miles of road. These roads would be tilled and blocked after harvest activities. Two existing log culverts on Spur M would be replaced with temporary crossings that would be removed during road decommissioning. Also existing rock surfaced roads 22-3-11.2, -11.3, and -11.4 would require 1.65 miles improvement which would include widening and grading. These roads would be blocked after harvest activities.

Existing culvert replacements would be upgraded to 100 year flood standards on main haul roads 21-3-33 (three), and 22-3-11.1 (four). In addition 1.00 mile of road 21-3-33 would be improved with a 4" layer of crushed rock.

The existing surfaced road density in Section 11 is 4.5 miles. This would drop to 2.88 miles after planned decommissioning is completed. The existing surfaced road density in Section 1 is 2.03 miles and would decrease to 1.93 miles.

Table 2.2.3 summarizes the miles of road construction, improvements and decommissioning under this alternative.

**Table 2.2.3**

| Harvest Area | *Temporary New Road Construction (Miles) | Improvement on Existing Road (Miles) | Existing Road **Decom. (Miles) | Total Decom. (Miles) |
|---|---|---|---|---|
| 1 | 0 | 0.47 | 0.47 | 0.47 |
| 2 | 0.85 | 3.90 | 2.51 | 3.36 |
| Totals | *0.85 | 4.37 | **2.98 | 3.83 |

*** Would be "Fully Decommissioned"**
****Would be "Decommissioned"**

### 2.2.4 Snag and Down Log Creation

Snags and down logs would be created within riparian reserves that are deficient in these habitat components. These activities would occur two or more years after harvest activities. Two to five snags per acre would be created by chainsaw topping, girdling or blasting, and one to five downed logs per acre would be created by felling live trees with a chainsaw. The numbers of snags and down logs created would depend on levels of post-harvest wind-throw. Live trees selected for snag and down log creation would vary in size and tree species.

## 2.3 Alternative III

### 2.3.1 Timber Harvest Activity in the Matrix

This alternative recommends a density management in approximately **361** acres of Matrix land use allocation. Silvicultural prescription treatment would remain the same as the proposed action. Cable yarding would occur on approximately **202 acres**, and ground based yarding on approximately **159 acres**.

### 2.3.2 Density Management within the Riparian

There would be no density management in the Riparian Reserve. Left untreated the Riparian Reserve would continue to grow at a slower pace. Inputs of coarse woody debris and snags would be smaller in diameter and less able to persist through time. The understory shrub layer would continue to decrease with less sunlight available for growth.

Table 2.3.1 Summarizes Alternative III

**Table 2.3.1**

| HARVEST AREA | TYPE HARVEST | LAND USE ALLOCATION | PROPOSED ACRES TO BE HARVESTED | VOLUME (MBF) |
|---|---|---|---|---|
| 1 & 2 | Density Mgt. | Riparian Reserves | 0 | 0 |
| 2 | Thinning | Matrix | 361 | 4115 |
| | | TOTAL | 361 | 4115 |

MBF = Thousand Board Feet

### 2.3.3 Roads

Same as the proposed action except there would be (0.15 miles) less temporary construction and 0.47 miles less improvement because there be no harvest in Area 1.

In harvest area #1, the existing portion of Spur M would be decommissioned, and the two log crossings on stream #13 & #14 would be removed and stream banks restored.

Table 2.3.3 summarizes the miles of temporary road construction, improvements and decommissioning in Alternative III.

**Table 2.3.3**

| Harvest Area | *Temporary New Road Construction (Miles) | Improvement on Existing Road (Miles) | **Existing Road Decom. (Miles) | Total Decom. (Miles) |
|---|---|---|---|---|
| 1 | 0 | 0 | 0.47 | 0.47 |
| 2 | 0.7 | 3.90 | 2.51 | 3.21 |
| Totals | *0.7 | 3.90 | **2.98 | 3.68 |

***Would be "Fully Decommissioned"**
****Would be "Decommissioned"**

### 2.3.4 Snag and Down Log Creation

Same as the proposed action.

## 2.4 Comparison of Alternatives

| ELEMENTS | ALT. I NO ACTION | ALT. II PROPOSED ACTION | ALT. III |
|---|---|---|---|
| Density Management Acres | 0 | 198 | 0 |
| Thinning Harvest Acres | 0 | 375 | 361 |
| TOTAL ACRES HARVESTED | 0 | 573 | 361 |
| * Miles of New Temporary Road Construction | 0 | *0.85 | *0.70 |
| Road Improvement on Existing Road | 0 | 4.37 | 3.90 |
| ** Existing Road Decommissioning | 0 | **2.98 | **2.98 |

*** Would be "Fully Decommissioned"**
****Would be "Decommissioned"**

# 3.0 AFFECTED ENVIRONMENTS

This section describes key components of the existing environment. The plants and animals do not differ significantly from those discussed in Chapter 3 of the 1994 RMP

## 3.1 Vegetation

The proposed harvest area was logged during the 1940's. Natural regeneration resulted in adequate conifer stocking throughout much of the area, with aerial seeding and planting used in those areas identified as deficient in conifer stocking. Salvage logging removed the seed trees and snags in 1952 and 1961. Most of the proposed harvest area was pre-commercial thinned from 1967 to 1978 and was aerial fertilized in 1991.

The common stand condition is a fully stocked over-story of Douglas fir with a minor hemlock component and occasional western red cedar. Hardwoods are sparse in uplands, occurring primarily in streamside locations. Density induced mortality has produced about a dozen snags/acre, generally < 10”diameter breast high.

Understory hemlock regeneration is well distributed throughout the stand. Common understory vegetation is salal, sword fern, Oregon grape, and vine maple.

### Noxious Weeds

Small infestations of scotch broom occur along the road within the project area (please see **Appendix A** for Design Features for weeds).

### Special Status Plants

Protocol surveys for vascular and non-vascular plants were conducted and no Special Status Plants were found.

## 3.2 Threatened and Endangered Species

### Northern Bald Eagle (Threatened)

Suitable nesting habitat for bald eagles is mature forest within one mile of a lake, river or major tributary. There is no suitable nesting habitat for bald eagles within or adjacent to the project area. No suitable nesting habitat would be modified or disturbed. Effects to this species will not be analyzed in this document.

### Northern Spotted Owl (Threatened)

Suitable nesting habitat for this species is mature forest (generally greater than 80 years old) with high canopy cover, an open understory, large down logs and large snags. There is no suitable nesting habitat within the proposed project area. There is an isolated 6 acre patch of suitable nesting habitat adjacent to the project area which is probably too small to provide quality nesting habitat for the northern spotted owl.

Dispersal habitat for spotted owls is generally defined as stands ranging from 40 to 79 years of age and with at least 40 % canopy closure. Juvenile spotted owls use dispersal habitat to roost and forage in as they disperse from their natal areas. Adults forage in dispersal habitat to support

themselves and their young. The existing habitat is relatively low quality dispersal habitat because it lacks the structural components (i.e. snags, structurally complex understory, larger trees) that provide high quality foraging opportunities. There are approximately 573 acres of dispersal habitat in areas proposed for harvest under Alternative II and 361 acres of dispersal habitat proposed for harvest under Alternative III.

The proposed project area is not within a designated Critical Habitat Unit (CHU). The nearest CHU (OR – 25) is 3.4 miles from the proposed project area.

The proposed action is located within the Provincial Home Range (1.2 miles) of the historic Hoodoo Mountain owl site located in 1981. The site has not had a single resident owl since the early 1991 or a resident pair since 1985. Surveys since 1991 have not located any owls at the site (1991 – 1994, & 1999). By 1990, the habitat at the site center was removed and most of the habitat on private and federal lands near the site center was also removed or degraded. The site did not meet the criteria for an owl core area under the Northwest Forest Plan.

**Spring Chinook Salmon (Threatened)**
The project area lies within two fifth field watersheds, Upper Coast Fork Willamette and Mosby Creek. Due to the lack of a upstream fish passage facility at Cottage Grove dam, spring Chinook is not found in the Upper Coast Fork Willamette Watershed. In Mosby Creek, which is accessible to spring Chinook and other anadromous species, the closest potential spawning and rearing habitat is approximately 3 river miles from the project area. However, due to poor aquatic habitat conditions during the migration period, spring chinook have not been documented in the Mosby Creek Watershed for many decades.

**Oregon Chub (Endangered)**
Oregon chub is a small minnow found only in the Willamette River Basin. It thrives throughout lowland areas of the Willamette Valley in shallow, slow moving waters, such as sloughs, beaver ponds, oxbows and side channels. Historically, in the Coast Fork Willamette Watershed, Oregon chub habitat extended into the lower portions of the Upper Coast Fork, Row River, and Mosby Creek. Currently, ODFW surveys (1992-2001) have found extremely low numbers of Oregon chub in the Sub basin (Camas Swale area), but have plans to reintroduce the species at several locations throughout the Coast Fork Willamette Sub basin. There are no introduction sites within 5 miles of the project area.

## 3.3 Survey and Manage

The ROD for the Supplemental Environmental Impact Statement Amending the Survey and Manage, Protection Buffer, and Other Mitigating Measures Standards and Guidelines was signed January 2001 and management of Survey and Manage species conforms to this and associated documents.

### 3.3.1 Mollusks
Crater Lake tight coil (*Pristiloma arcticum crateris)* is a Category B Survey and Manage mollusk on the upper Willamette Resource Area. The current survey protocol (Version 3.0 BLM Instruction Memorandum No.OR-2003-044) categorizes the Eugene District within the species range. Under this protocol, surveys are required within suitable habitat which is defined as areas that are within10 meters (33 ft) of perennially wet areas in forests and riparian areas above 2000

feet in elevation. A 75 ft. and 150 ft. no timber harvest buffer (no yarding and no new road construction) would be established around riparian reserves areas within the project areas which would protect the microclimate of the existing habitat from degradation. Since there is no harvest within suitable habitat and the microclimate would be maintained, no surveys would be conducted in buffered riparian reserves. Wetlands and seeps that do not have the 75 ft. or 150 ft. buffers adjacent to the riparian reserves would have surveys conducted during the spring of 2003. If Crater Lake tight coil is located during these surveys, sites would be managed under current management recommendations for this species. Effects to this species will not be analyzed in this document.

### 3.3.2 Red Tree Vole

The red tree vole is a Category C Survey and Manage mammal on the Upper Willamette Resource Area. The current survey protocol (Version 2.1; BLM Instruction Memorandum No. OR-2003-003) categorizes the Eugene District within the Northern Mesic Forest Distribution Zone. Under this protocol, surveys are not required in this zone if the proposed action is in a stand of merchantable conifers that is <16" diameter breast high quadratic mean diameter (QMD). Stand data collected in 2002 shows that Section 1 and section 11of the proposed project area has a QMD of 14.0". The proposed project area is comprised of stands that are 43-53 years old. These stands do not fulfill the criteria requiring surveys under the current protocol. No surveys were conducted for red tree voles and effects to this species will not be analyzed in this document.

### 3.3.3 lichens, Bryophytes and Vascular Plants

Lichens, bryophytes, and vascular plants were surveyed and no species requiring management were found in the analysis area.

## 3.4 BLM Sensitive Species

### 3.4.1. Northern Goshawk

Nesting habitat for goshawks can generally be defined as closed-canopy stands of mature and old-growth coniferous forests. There is no suitable nesting habitat for goshawks within the proposed project area.

Foraging habitat for goshawks can generally be defined as an open understory, mixed in with hardwoods, but mainly dominated by mature conifers with a canopy closure $\geq$ 40%. The proposed project area may be utilized by goshawks as foraging habitat and is comprised of stands that are 43 – 53 years old with an average stand diameter of 14.0 diameter breast high and an estimate of 80% - 90% canopy closure.

Home ranges of nesting goshawks are found to be approximately from 1,200 – 11,000 acres depending on sex and habitat characteristics. Goshawks are also found to frequently forage within 2 miles of their nest. Goshawks could forage in the proposed project area based on the existing habitat there and the distance from their known nest sites. A pair of goshawks nested in the adjacent section 15 in 1997 and 1998 (within 0.60 mile of the proposed project area). Subsequent surveys found no nests in 1999 and 2000; however, goshawks were heard in the vicinity. Surveys will be conducted in late spring 2003. The existing habitat in section 15 has conifers 33 – 63 years old. The diameter breast high on these trees is between 11 – 30 inches,

with a canopy closure of $\geq$ 40 %. There are approximately 2,703 acres of foraging habitat on BLM federal lands within a 2 mile radius from these two nests.

The habitat in the proposed project area lacks structural components (i.e. snags, coarse woody debris, larger trees) that provide quality foraging opportunities. There are approximately 573 acres of foraging habitat in areas proposed for harvest under Alternative II and 361 acres of foraging habitat in areas proposed for harvest under Alternative III.

## 3.5 Soils

The Brush Mountain timber sale area is geologically mapped within the Fisher Formation (Tfe). The Fisher Formation consists of up to 7,000 feet of andesitic lapilli tuffs and breccias, basaltic and lesser rhyolitic fragments and conglomerates. The Formation is locally highly pumiceous and nonmarine in origin. The dip of underlying beds is to the east, the result of the uplift of the Oregon Coast Range. Vertical uplift was accompanied by faults and by broad warping. The result was the creation of valleys that are steep walled, with block faulting that has produced step-like escarpments. In the Brush Mountain general area, major streams and their principal tributaries are characterized by a trellis drainage patterns suggesting structural control. This is substantiated by multiple fault zones around the southern Willamette Valley in the region of the timber sale. All these geologic forces have created a very complex landscape. In some places, the geology makes bold rocky outcrops prevalent with debris avalanches and shallow soils. In others, where the finer tuffs have weathered, the hillsides are covered by ancient slump earthflow landslides and deeper soils. Section 11 of the Brush Mountain timber sale has a general western aspect that has low slope gradients. Older soils have developed on ancient slumps while more shallow and stony soils have developed from the more resistant andesitic basalt outcrops.

Slopes along streams range between low (0 - 35%) and steep (> 70%). Relief from stream bottom to upslope varies from less than one hundred to hundreds of feet before a break in slope. Some exposed rock is present along the steepest draws. Sloughing of soils on steep slopes is predictable and small side slope failures are present.

Field reconnaissance and air photo interpretation indicate that no large landslides have occurred during historical time in the unit. There are some small rotational slumps on steeper slopes within forested areas. It is unknown if these are the result of previous forest practices. Both Sections 1 and 11 were harvested in the 1940s and 1969 air photos clearly indicate that much ground disturbance still existed at that time.

Predominant soils found in the Brush Mountain timber sale (Figure 2) include Honeygrove Klickitat and Peavine (U.S.D.A. 1987). Honeygrove and Peavine are clay soils that are highly erodible, compact easily and stay in suspension longer in water. The soils are deep and have a high Site Index that correlates to a high amount of on-site nitrogen and potential site productivity. All soils are susceptible to compaction. With a reduction in pore space in the soil, air and water availability for plants decreases. Soil porosity is an essential component of site productivity, instrumental for water infiltration, water storage and gas exchange. Soils with good porosity have favorable conditions for root growth, water movement, nutrient uptake by roots, and mychorrihizal growth. Displacement of soil and organic matter reduces the fertility of the soil. Honeygrove soils are deep (40-60 inches). The surface layer is a silty clay loam, and the subsoil is up to 60% clay. There may be up to 15% rock fragments present. Permeability is moderately

slow, runoff is medium and hazard of water erosion is high. These soils are susceptible to compaction. Physical and chemical data of the Honeygrove soil indicate that at 15 Bar (wilting conditions), between 0 and 8.1 inches, the soil moisture content is 37.1%. Clay soils have been shown to remain above 45% in soil moisture during the dry season in the Coast Range and therefore, compaction mitigation is problematic because of the moist conditions.

Klickitat soils are deep (40-60 inches). The surface layer is dark brown stony loam and the subsoil is a very cobbly clay loam. Fractured andesitic basalt outcrops are present and the soils in some areas are stony and shallow. This soil contains low amounts of organic matter and nitrogen, have low clay content and high stone content. Permeability in Klickitat soil is considered moderate, runoff is rapid and the hazard of water erosion is high. Common failure of soil occurs when a pocket of soil in slopes greater than 70 percent is disturbed causing small slumps.

Peavine soils are moderately deep (30-40 inches). The surface layer is a silty clay loam, the subsoil is silty clay with soil horizons containing between 30-60% clay. Unstable areas associated with Peavine soil are in steep, concave slopes at the heads of drainages, the edges of benches, or areas where ground water accumulates. Common slope failure is of the slump and earthflow type. Rock fragment content in the soil profile is typically less than 20%. Permeability is moderately slow due to the heavy textures and absence of coarse fragments, runoff is rapid and hazard of water erosion is high. These soils are susceptible to compaction. Physical and chemical data of the Peavine soil indicate that at 15 Bar (wilting conditions), between 0 and four inches, the soil moisture content is 22.3%. Monitoring of soil moisture conditions before operations begin is needed to ensure site conditions meet the objectives of the Eugene District ROD.

Field reconnaissance indicates that remnant compaction from the previous harvest entries is evident and that recovery of the Honeygrove and Peavine soils is slow. Skid trails are still evident on the lower sloped landforms where steeper slopes did not restrict the use of ground based tractor logging. Although Honeygrove and Peavine are mapped across large parts of Sections 1 and 11, field work indicated that there are many inclusions of rocky outcrops and stony soil throughout the mapped area.

Harvest area 1 is located on a gently sloped bench (0-6%) between stream 11-13 and stream 11-30 with Peavine soil. There is a definite break-in-slope along the upper edges of the bench straddling the streams. An existing dirt road traverses the full length of the Unit (approx ¾ mile). There are two log culverts on S 11-13 that have either the potential to, or have failed. There is chronic sedimentation into the stream from both culverts. Compaction from legacy skid trails exists on the bench.

## 3.6 Hydrology and Water Quality

The project area is located within two 5th field Watersheds: Upper Coast Fork Willamette River Watershed and Mosby Creek watershed. There are numerous streams, wetlands, springs, and seeps located within or adjacent to the project area. A hydrology map in the EA file shows where the features are located within the project area. Brief descriptions of the hydrology features are included on the stream and wetland information sheet.

The main drainage in the project area within the Upper Willamette River Watershed is Wilson Creek. The Wilson Creek tributaries vary from 1st order headwater streams to a 4th order stream (stream S 11-30). The streams in the project area in the Upper Coast Fork Willamette River Watershed generally drain in a northwest, southwest, or west direction. Wilson Creek flows directly into Cottage Grove Reservoir approximately 2 ½ miles downstream of the project area. The Wilson Creek drainage area is about 6,317 acres in size. About 25 % of the drainage area is currently in a young forest age class (0-15 years old). About 70 % of the drainage area is currently in an intermediate age forest age class (16-79 years old).

The main streams in the project area within the Mosby Creek Watershed are headwater tributaries (1st and 2nd order) to Smith Creek. The streams in the project area in the Mosby Creek Watershed generally drain in a northwest, northeast, or east direction. The Smith Creek drainage is predominately forested with 30 to 60 year old stands. About 5 % to 10 % of the drainage area is currently in a young forest age class (0-15 years old). About 10 % of the drainage area is currently in the 16-29 year old forest age class.

Most of the larger streams within the project area have stream gradients that are 4 % to 10 %. The larger streams have substrate that is predominately gravel and cobble. The smaller, steeper streams generally have substrate that is fine material to medium gravel.

Most streams surveyed in the project area had a moderate density of large woody debris. Existing stream canopy cover is good within the proposed sale area. Most of the streams have canopy cover that is 70 % to 90 % (or greater). Riparian areas are generally a mix of conifer and hardwoods. Channel down cutting or channel aggrading did not appear to be a notable problem on the surveyed reaches. Bank stability for the streams in the proposed project area appeared to be fair to good, although some banks are steep.

Much of the project area is on gentle to moderate topography with many existing tractor skid trails located in the project area. Existing tractor skid trails are particularly numerous in section 11. There are also steep to very steep stream side areas within the project area. Topography in the project area varies from 0 % to 90 %. There are also several old stream crossings from roads or skid trails that occurred from the last harvesting entry. Eight road-stream crossings within the project area were identified as potential sources of sediment to downstream fish habitat and water quality. Road No. 22-3-11 was abandoned after logging (1950's), and had log/earthen road fills over six stream crossings. Two of the major road fills were removed in FY 2001 under a BLM service contract, one site remains undisturbed, and three sites have failed and the streams have regained their original channels, but continue to have sideslope failures associated with them. In the southwest corner of Section 1 and road N. 21-3-33 (NW ¼ Section 11) are additional old road/stream crossing of similar condition, where the stream flow is eroding the old earthen/log fill. In all cases, these crossings have the potential to add significant quantities of sediment directly to downstream fish habitat.

Elevations in the project area vary from 1,200' to about 2,450'. Rain-on-snow events in the Cascade Range are unusual at elevations below 1,500'. Approximately three-quarters of the project area are at elevations that have the dominant precipitation in the form of rainfall. The remainder of the project area is at elevations that are in the transient snow zone.

There are no filed water rights in the Wilson Creek or Smith Creek drainages. The closest filed water rights are for irrigation rights on Mosby Creek approximately 2 miles downstream of the project area and in Cottage Grove Reservoir.

Mosby Creek is listed on the Oregon Department of Environmental Quality (ODEQ) 2002, 303d list as water quality limited due to high summer water temperatures. Wilson Creek is not currently listed on the ODEQ 2002 303d list. The Upper Coast Fork of the Willamette is listed below Cottage Grove Reservoir for high summer water temperatures.

## 3.7 Fisheries

The project area lies within the Wilson Creek and Smith Creek drainages, Upper Coast Fork Willamette River and Mosby Creek fifth field watersheds respectively. Both fifth field watersheds are part of the Coast Fork Willamette Subbasin (4th field). The majority of the treatment area (~ 77%) is located in the Wilson Creek drainage, with the remainder of the treatment area occurring within the Smith Creek drainage.

Wilson Creek is a large 7th field watershed which is located above the Cottage Grove dam. It flows into the Cottage Grove Reservoir from the east, and provides spawning and rearing habitat for cutthroat and rainbow trout, sculpin spp., dace, and redside shiners. Spring chinook (listed as threatened under the ESA) and winter steelhead are the only anadromous species native to the Coast Fork Willamette; however, due to the lack of an upstream fish passage facility at Cottage Grove dam neither species are found in the Upper Coast Fork Willamette Watershed.

Smith Creek is a moderate size 7th field drainage located in the mid-portion of the Mosby Creek Watershed. Smith Creek supports populations of cutthroat and rainbow trout, and potentially sculpin spp. in low gradient reaches. Mosby Creek is accessible to anadromous species such as spring chinook and winter steelhead. Both species are believed to be indigenous to the watershed, but were probably not very abundant in Mosby or the Coast Fork Willamette (Willis et al. 1960). Both species have not been documented in Mosby Creek and Coast Fork Willamette River in many decades, primarily because of poor habitat conditions such as high stream temperatures and inadequate holding pools.

Within the project area, tributaries (reaches) of Smith Creek (Section 1; Reach 1, 9 through 13) are headwater reaches that have steep channel gradients (>30%) and moderate to steep step-over boulder and bedrock morphology. Due to downstream natural barriers such as waterfalls and steep channel gradients, these reaches are non-fish bearing. The upper extent of fish bearing habitat (cutthroat) is located in Section 6 approximately 2,000 feet east of the project area.

The remaining streams within the project area (SW corner Section 1 and Section 11) are tributaries of Wilson Creek. Many of these reaches or reach segments are non-fish bearing due natural barriers such as steep channel gradients, falls, or steep step-over boulder or log features. The following list summarizes the upper extent fish bearing habitat within the project area. These reaches are predominately spawning and rearing habitat for cutthroat trout. No other species were documented with the project area (see Map in EA file).

# 4.0 Environmental Effects – Common To All Action Alternatives

## 4.1 Consistency with Aquatic Conservation Strategy Objectives

The intent of the Aquatic Conservation Strategy (ACS) is to maintain and restore aquatic habitats and the watershed functions and processes within the natural disturbance regime by prohibiting activities that retard or prevent attainment of ACS Objectives. The primary emphasis of the Standards and Guidelines for Riparian Reserves is restoration of the ecological processes and stream habitats that support riparian dependent organisms. **The following narratives briefly describe how the No Action (alternative I), Proposed Action (alternative II), and alternative III would influence each numbered ACS objective.**

## How project meets ACS Objectives for Alternative I (No Action)

1. **Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.**

   This alternative would maintain the distribution, diversity, and complexity of current watershed landscape-scale features. Alternative I would result in an eventual slowing of individual tree growth, resulting in the slowest development of large trees; and therefore the development of large snags and large woody debris; the slowest development of vertical and horizontal structural development; and the least increase in species diversity. Thus, this alternative would result in the slowest development of late-successional forest characteristics, species diversity, or structural development in the Riparian Reserve. This alternative would maintain the current vegetative structural components necessary to protect habitat for fish and other aquatic-dependent species.

2. **Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include flood plains, wetlands, up slope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.**

   This alternative would maintain the current spatial and temporal connectivity within and between watersheds. Existing road/stream crossings on Rd No. 22-3-11, Rd No. 21-3-33, and unnumbered road in Section 1 and 2 would not be rehabilitated. These sites would continue to reduce connectivity to suitable upstream habitat for various aquatic-dependent species, and would be a long-term source of soil erosion and sedimentation to downstream fish habitat. The barriers might eventually open up through natural flow events.

   No action would maintain slope stability at the natural variability of landslide occurrence.

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

   The physical integrity of the aquatic system would not be maintained under this alternative. The untreated areas around all streams would maintain the physical integrity of the aquatic system. The physical integrity of the aquatic system would continue to degrade overtime at road/stream crossings mentioned in Objective 2. The potential addition of large woody debris contributing to the restoration of the physical system is likely to take longer under this alternative than under Alternative II because of slower tree growth rates. The failed stream crossing sites and existing log fills would not be restored under this alternative as under Alternatives II

or Alternative III. These would remain as moderate to high risk sites for localized impacts to the physical integrity of the streams. Existing stream crossing culverts would remain as is. Some of these would remain as moderate to high risks of failure under high flow conditions because of the undersized condition of the drainage structures. The risk to physical integrity would be higher under this alternative than under Alternative II and Alternative III because of the risk of culvert pipe failure. Natural processes would accelerate erosion and sediment loading to downstream spawning habitat.

4. **Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.**

This alternative would not maintain the water quality necessary to support healthy aquatic, riparian, and wetland ecosystems. There are locations within the project area that would remain as moderate to high risks of erosion /sedimentation because of undersized culverts, log fills, or failed stream crossings. There would be no risk to water temperature because of the maintenance of existing shading conditions. There would be no additional risk of bank or channel disturbance from human activities. There would be no short term risk of sedimentation from restoration activities, road construction, or road renovation. Little to no impacts to other water quality parameters such as pH, conductivity, dissolved oxygen, and nutrients would occur under this alternative. There would be no risk of hazardous material spills (petroleum products) reaching a hydrologic feature.

5. **Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.**

No additional soil disturbance from harvest operations, including roads and skid trails, results in maintaining the current sediment regime. However, chronic sedimentation from failing, undersized and plugged culverts results in a potential water quality impact. The existing failed stream crossings, skid trails, log fills, and undersized culverts would remain as is and the risk of fill failure would remain as moderate to high from future natural flow events. The risk of erosion or sedimentation would at least be a chronic problem at these locations. There is a risk of future large fill failures at these sites.

6. **Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.**

This alternative would maintain in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. Existing conditions that affect summer low flows, overall water yield, and peak flow would remain on the current trajectory. There would be no alteration in the factors that influence evapotranspiration and interception. There would be no influence on peak flow conditions within the stand.

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

This alternative is likely to maintain the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands. The existing vegetative cover of the project area would be retained. There would be no new road building or harvest occurring near floodplains, meadows, or wetlands.

8. **Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distribution of coarse woody debris sufficient to sustain physical complexity and stability.**

Species composition and structural diversity of riparian plant communities would be maintained at current levels in the short term. Long term the composition and structure of these communities would continue on current trajectories. Alternative I would not have accelerated development of large trees and creating snags and down logs within the riparian reserves.

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

Habitat for riparian-dependent species would be maintained at current levels in the short term. Long term this habitat would continue on the trajectory that it is on currently.

## How project meets ACS Objectives for Alternative II (Proposed Action)

1. **Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted**

This alternative is likely to maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features in relation to the aquatic systems. All streams would have unthinned buffers of at least 75'. This alternative would have the potential benefit of hastening the development of late-successional characteristics of the residual stand because of the density management that would occur. The removal of old earthen/log road fills, installing culverts, and upgrading existing culverts would benefit the distribution of aquatic-dependent species. The rehabilitation of these sites would reconnect interacting aquatic communities and aquatic production from headwaters to river reaches.

2. **Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include flood plains, wetlands, up slope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.**

This alternative would maintain and restore the spatial and temporal connectivity within and between watersheds. All fish bearing and non-fish bearing streams within the project area would have untreated buffers of 75-150 feet on either side of the stream. These untreated buffers would provide protection to over-steepened and/or unstable stream banks and headwalls. Riparian reserves and no-cut buffers along streams would maintain and restore the natural variability of landslides on stream adjacent hill-slopes. The existing chemical and physical routes would be retained. There would be no new road/stream crossings associated with this alternative. The rehabilitation of road/stream crossings on Rd No. 22-3-11, unnumbered road in section 1 and 2, installation of culverts, and the upgrade of undersized culverts would help restore the temporal and spatial connectivity within and between watersheds.

The thinned stands up-slope of riparian areas would retain adequate supplies of future large woody material. Thinning would speed the development of late-successional stand characteristics, and therefore would contribute to the restoration of a network of late-successional Riparian Reserves over the long-term.

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

This alternative would maintain and restore the physical integrity of the aquatic system. The untreated areas within Riparian Reserves and the rehabilitation of old road/stream crossings would ensure that the proposed project would: 1) maintain streambank integrity or tree/shrub root strength and undercut banks; 2) protect stable large woody debris in the channel; 3) protect stream temperature; and 4) contribute to restoring the natural sediment regime. Thinning in Riparian Reserves would speed the development of future large woody debris, which would contribute to the restoration of the physical integrity of the aquatic ecosystem. Improvements to existing roads, such as adding relief culverts, upgrading stream crossing culverts, rock placement, and road decommission, would ameliorate most current erosion and sedimentation concerns, and provide long-term benefits to the physical integrity of the aquatic environment.

This alternative would potentially contribute to the restoration of the physical system by developing large trees more quickly than under Alternative I.

4. **Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.**

Water Quality is likely to be maintained under this alternative. Impacts to stream temperature are expected to be negligible. Shading around hydrologic features would remain similar to current conditions with untreated buffer areas and a high level of canopy retention. Few stream-side trees would be cut to accomplish restoration activities. Yarding corridors across streams are not needed. Cable corridors would have little to no impact to stream temperature. Direct physical impacts to channels and banks would be avoided during harvest operations with untreated reserves around all the streams. Some disturbance to stream banks and stream crossing fills would occur from the restoration activities. Minor, short term increases in erosion/sedimentation are expected in these localized areas (see Objective 5 below). The restoration activities are likely to reduce the long term risk of chronic and/or catastrophic erosion and sedimentation at these sites.

Little to no impacts to water quality parameters such as pH, conductivity, dissolved oxygen, and nutrients are likely.

5. **Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.**

This alternative would maintain and restore the sediment regime under which this aquatic ecosystem evolved. Some short-term sedimentation is likely under this alternative from restoration activities due to the proximity to streams. The long term risk of major fill failures at these locations is likely to be reduced. Erosion from new roads would be unlikely to reach streams because of the filtering effect of the buffer areas. More native surface road would be constructed under this alternative than the other alternatives. The road design features would reduce the risk of sedimentation.

Using existing roads for timber haul could produce a short term increase in erosion and possibly some sedimentation. The haul route would be predominately over gravel and paved roads that have a much higher resistance to erosion then native surface roads. About 2½ miles of the haul route would be over native surface roads. Haul over these roads would occur during the dry season and these roads would be

storm-proofed between logging seasons to greatly minimize erosion and sedimentation. All new roads would be decommissioned upon completion of the project.

6. **Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.**

The design features incorporated with the proposed action are expected to maintain the elements outlined in ACS 6. This alternative might contribute to an increase in summer low flows, peak flows, and overall water yield because of the reduction in evapotranspiration and interception due to the removal of some of the trees. Approximately 212 more acres and 60 % more volume would be harvested under this alternative than under Alternative III.

Water yield changes due to forest management activity are usually too small to be measured. Changes in water yield are generally detectable only in the immediate vicinity of harvested units.

The removal of over-story usually results in an increase in summer flow. An increase in summer low flows can reduce summer stream temperatures and provide additional habitat for stream biota. Water yield and summer low flow increases are usually temporary impacts that gradually diminish over one to several decades as forest re-growth occurs. Changes to summer low flows and overall water yield are expected to be low because of the high retention of over story.

The impact to peak flows from reduction in evapotranspiration and interception under this alternative would most likely be an increase to small, frequent flow events from late summer to early winter when less precipitation is needed to recharge soil moisture.

New roads would be temporary use and would be located on or near ridge tops. New roads would be out-sloped to avoid routing water via ditch lines to the stream network. More permanent compaction would be expected under this alternative than the other alternatives because of the addition of these roads, skid trails, yarding corridors, and landings. The tillage of renovated roads and landings, and existing skid trails used for harvest that are already compacted is likely to improve infiltration and hasten vegetative recovery in these areas. The tillage of new roads and new skid trails would help ameliorate some of the compaction and infiltration impacts.

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

This alternative would maintain on the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

8. **Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distribution of coarse woody debris sufficient to sustain physical complexity and stability.**

Species composition and structural diversity of riparian plant communities would be maintained for riparian vegetation within Riparian Reserves. Thinning trees and creating snags and down logs within the Riparian Reserves would increase the habitat complexity and accelerate the timeframe for attainment of late seral habitat characteristics within Riparian Reserves. No timber harvest would occur within 75 feet or 150 feet, so riparian habitat components would not be directly affected by harvest activities.

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

Habitat for riparian-dependent species would be maintained. No timber harvest would occur within 75 feet or 150 feet (see Appendix C Map), so riparian habitat components would not be directly affected by harvest activities. Habitat within Riparian Reserves would be improved for many species by the creation of snag and down logs.

## How project meets ACS Objectives for Alternative III

1. **Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted**

Alternative III would maintain the distribution, diversity, or complexity of current watershed landscape-scale features. This alternative has similar design features as Alternative II, except, no thinning would occur within Riparian Reserves which would not hasten the development of late-successional forest characteristics of the Riparian Reserve and associated benefits.

2. **Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include flood plains, wetlands, up slope Areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to Areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.**

This alternative is likely to maintain and restore the spatial and temporal connectivity within and between watersheds. Drainage network connections would be protected with the large untreated riparian reserves around all streams. Yarding corridors across stream channels are not proposed under this alternative so stream channels and stream banks would be protected. Chemical and physical routes would be improved by the removal of some of the existing stream crossing fill barriers from the previous harvesting entry.

There would be no thinning within Riparian Reserves, however, The rehabilitation of road/stream crossings on Rd No. 22-3-11, unnumbered road in section 1 and 2, installation of culverts, and the upgrade of undersized culverts would help restore the temporal and spatial connectivity within and between watersheds. This would allow less mobile species (macroinvertebrates and some amphibian) to move between streams. There would be a less chance of road erosion or culvert failure in the near future which could prevent sedimentation and provide quality habitat for aquatic dependent species. Long term habitat connectivity within these two sections of the watershed would be maintained and improved.

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

This alternative has similar design features as Alternative II that would maintain and restore the physical integrity of the aquatic system. Road closures, upgrading culverts, and road/stream crossing removals would ameliorate current erosion and sedimentation concerns, and provide long-term benefits to the physical integrity of the aquatic environment. This alternative would have no additional cumulative effect on fisheries resources, other than slowing the development of trees capable of producing large woody debris that reaches the stream channel.

This alternative would not hasten the development of large trees within Riparian Reserves as under Alternative II. This alternative would not involve the placement of temporary log fills across streams S 11-13 and S 11-14 as under Alternative II so there would be less disturbance of these existing sites.

4. **Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.**

The risk of impacts to water quality is expected to be similar to Alternative II. The untreated areas around all streams would be larger than under Alternative II. The restoration activities would be similar to Alternative II.

5. **Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.**

Decommissioning roads and skid trails maintains and restores infiltration and aids in preventing erosion of soils and sedimentation. Replacing failed, undersized or plugged culverts restores the natural sediment regime.

The risk of sedimentation under this alternative is expected to be similar to Alternative II. The risk is likely to be low because of the large unthinned buffers around all streams. The risk of localized sedimentation in the vicinity of the restoration activities is expected to be similar to Alternative II. There would be fewer disturbances at stream crossing sites at streams S 11-13 and S 11-14 as log fills would not be needed under this alternative.

The risk of erosion and sedimentation from the transportation of logs under this alternative would be similar to lower than Alternative II because of the lower harvest level. The haul route and the period of haul would be similar to the Alternative II.

Less acreage would be disturbed in the yarding of logs and less vegetation would be removed than under Alternative II. Compaction would be lower under this Alternative than under Alternative II because of a smaller harvest area, less ground based harvest, and less new temporary road construction.

6. **Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.**

This alternative is likely to cause changes to summer low flows, peak flows, and overall water yield that are lower than under Alternative II. Less vegetation removal would occur under this alternative in relation to Alternative II. The reduction in interception and evapotranspiration would be less under this alternative than under Alternative II. Compaction impacts are expected to be lower than under Alternative II because of the smaller harvest area, smaller amount of ground based yarding area, and a lower amount of new road construction.

The potential risk of greater snow accumulation and snow melt that is associated with rain-on-snow events would be similar or lower than Alternative II because less area would be harvested.

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

This alternative would have similar impacts on the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands as the alternatives I and II.

8. **Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distribution of coarse woody debris sufficient to sustain physical complexity and stability.**

Species composition and structural diversity of riparian plant communities would be maintained for riparian vegetation within Riparian Reserves. Creating snags and down logs within the Riparian Reserves would increase the habitat complexity. No timber harvest would occur within Riparian Reserves.

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

Habitat for riparian-dependent species would be maintained at current levels. Habitat within Riparian Reserves would be improved for many species by the creation of snag and down logs. Long term this habitat would continue on the trajectory that it is on currently.

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

**4.3 Wetlands** – Since no ground disturbing activities would occur in meadows and wetlands, the hydrology in these sensitive areas would be maintained in the current condition.

**4.4 Special Status Plants –** Non-vascular and vascular plant surveys were conducted and no threatened, endangered, or sensitive vascular plants were found.

**4.5 Invasive and Non-Native Species** – Mitigation measures outlined in Appendix A, Design Features, would reduce the spread of weed seeds into and around the project area. The reasonable cleaning of the logging and construction equipment, called for in the design features, would remove a large portion of any seed present. This would have a high probability of preventing or reducing the spread of weeds on BLM lands.

**4.6 Threatened and Endangered Species**

**Northern Spotted Owls (Threatened)**

The quality of thinned dispersal habitat immediately post harvest would decrease because the canopy closure would be reduced to 50 % - 60% and the number and quality of down logs would be reduced by harvest activities. This could temporarily impair the ability of owls to disperse successfully within the proposed project area. It is unknown to what degree, if any, this habitat is currently utilized by spotted owls.

Long-term habitat within the project area would improve in quality as a result of the proposed thinning under Alternative II. While canopy closure is reduced, understory vegetation would be expected to increase in complexity. Existing understory trees would increase in size. Within 20-25 years the canopy closure would return to current levels, and the understory development would decrease. Trees in the thinned areas would increase in size more rapidly than in unthinned areas. Over time, the created snags and down logs would begin to decay, providing important habitat components for foraging owls. Larger trees in the project area, together with created snags, down logs and more developed understory, would result in improved dispersal habitat for spotted owls. Thinned riparian reserve areas would be expected to attain late seral stage characteristics and become suitable habitat for spotted owls more quickly than they would if they were not thinned.

The effects of Alternative III to Matrix lands are the same as for Alternative II. Snags and down logs would be created in riparian areas, but no riparian reserve habitats would be thinned under Alternative III. Under Alternative III, the stand composition and structural diversity of approximately 198 acres of riparian reserve stands within the proposed project area would continue on the current trajectories. This habitat would remain low quality dispersal habitat in the long term. It would take decades longer for these riparian areas to become suitable spotted owl habitat.

Recent timber sales and the proposed action alternative on BLM Federal lands in the Upper Coast Fork Willamette River and Mosby Creek Watersheds would treat approximately 1,168 acres of density management. These sales would degrade a total of approximately 1,168 acres of dispersal habitat. The alternatives would be expected to have a neutral effect or improve spotted owl habitat. In the next 3-4 years no additional harvest actively on BLM federal lands would occur within this watershed.

Private lands in the watershed currently provide habitat for spotted owls. Based on recent stand rotations rates, it is likely these habitats would be removed by future actions.

### Spring Chinook Salmon (Threatened)

Due to the distance of these activities from potential spring chinook habitat, there would be no effect to spring chinook or critical habitat as a result of the proposed actions, thus consultation is not necessary.

### Oregon Chub (Endangered)

Due to the distance of these activities from Oregon chub habitat, there will be no effect to Oregon chub as a result of the proposed actions, thus consultation is not necessary.

**4.7** **Northern Goshawk (Bureau Sensitive Species)** – In the short term (< 25 years), a total of 573 acres of foraging habitat would be impacted under Alternative II. The quality of the habitat would decrease immediately post harvest because the canopy closure would be reduced to 50% – 60% by the harvest activities. This could temporarily impair the ability of goshawks to forage within the proposed project area. Within a two mile radius of the goshawk nests found in 1997 and 1998 there is a total of 1,838 acres of foraging habitat on BLM federal lands. This acreage is within the home range of nesting goshawks (1,200 – 11,000 acres) and could provide sufficient nesting habitat for a pair that would not be degraded. Post harvest, the canopy closure would decrease and the understory vegetation (herb/shrub layer) would be expected to increase. This

could allow for an increase of habitat competition with great horned owls as well as alter the prey species available to goshawks within the proposed project area. It is unknown to what degree, if any, this habitat is currently utilized by goshawks.

Long term (> 25 years), habitat within the project area would improve in quality as a result of the proposed thinning. Within 20-25 years the canopy closure would return to current levels. Trees in the thinned areas would increase in size more rapidly than in unthinned areas. Over time, the created snags and down logs would provide perches, plucking posts, and prey for goshawks. Larger trees in the project area, together with created snags and down logs would result in improved forage habitat for goshawks.

The effects of Alternative III to Matrix lands are the same as for Alternative II except that there are fewer acres to be treated. Snags and down logs would be created in riparian areas, but no riparian reserve habitats would be thinned under Alternative III. Under Alternative III, the stand composition and structural diversity of 212 acres of riparian reserve stands within the proposed project area would continue on the current trajectories. Past and recent federal timber sales and including the proposed action alternatives within two mile radius of the goshawk's nests would be neutral or improve goshawk's habitat. Private lands within the two mile radius could contribute to reducing foraging habitat thus limit goshawks' ability to reproduce. Based on recent stand rotations rates, it is likely these habitats would be removed by future actions.

**4.8 Cultural Resources** – No Cultural sites have been identified. The analysis file contains the cultural report.

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

**4.10 Environmental Justice** – To comply with Executive Order 12898 of February 11, 1994, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, the Bureau of Land Management, Eugene District, will ensure that the public, including minority communities and low income communities, have adequate access to public information relating to human health or environmental planning, regulations, and enforcement as required by law.

The District has not identified any environmental effects, including human health, economic and social effects of Federal actions, including effects on minority populations, low income populations, and Native American tribes, in this analysis.

**4.11 Solid Or Hazardous Materials** – There are no hazardous materials issues in the proposed project area.

# 5.0 LIST OF AGENCIES AND PERSONS CONSULTED

This Environmental Analysis is being mailed to the following members of the public or organizations that have requested to be on the mailing list:

John Bianco
Oregon DEQ
Jim Goodpasture
Pam Hewitt
Charles & Reida Kimmel
Lane County Land Management
Carol Logan, Kalapooya Sacred Circle Alliance
Oregon Dept of Fish & Wildlife
Oregon Dept of Forestry
Oregon Natural Resources Council
The Pacific Rivers Council
John Poynter
Leroy Pruitt
Roseburg Forest Products
Peter Saraceno
Sierra Club – Many Rivers Group
Swanson Group Inc.
Craig Tupper
Jan Wroncy
Kris and John Ward
Robert P. Davison
Tom Stave, U of O Library
John Muir Project
James Johnston
Molly Widmer
David Simone
Bart Pratt
Neal Miller
Weyerhaeuser Company

A summary was sent to those receiving the "Eugene BLM Planning and Project Focus", December 2002 (approximately 250 mailings – a complete listing is available at the Eugene District Office).

Maps of the Proposed Action were sent to the Confederated Tribes of the Grand Ronde and Confederated Tribes of Siletz in February 7, 2003. No comments were received.

## 6.0 LIST OF PREPARERS

**THE INTERDISCIPLINARY TEAM**

| NAME | TITLE | RESOURCE/ DISCIPLINE |
|---|---|---|
| Karin Baitis | Soil Scientist | Soils |
| Jill Williams | Forester | Timber |
| Sally Villegas | Wildlife Biologist | Wildlife |
| Michael Southard | Archaeologist | Cultural Resources |
| Pete O'Toole | Forester | Silviculture |
| Molly Widmer | Botanist | Special Status Plants, Survey & Manage, and Weeds |
| Chuck Vostal | Fisheries Biologist | Fisheries |
| Mike Sabin | Engineering | Roads/Transportation |
| Steve Steiner | Hydrologist | Water Resources |
| Christie Hardenbrook | Environmental Specialist | EA Writer |
| Don Wilbur | Natural Resource Protection Specialist | Team Leader / NEPA Coordinator |

# APPENDIX A

## DESIGN FEATURES COMMON TO ALL ACTION ALTERNATIVES

### Design Features For General Harvesting

1. Density management prescriptions would be the same for both Matrix and Riparian Reserve Land Use Allocation (LUA) in **harvest area two**: Thin from below, harvesting trees from the suppressed, intermediate and co-dominate crown classes. This generally reserves larger diameter, more vigorous trees from dominant and co-dominant crown classes. Tree spacing would vary as needed to reserve larger trees. Hardwoods and snags would be reserved where possible. All cedar trees would be reserved. For **Harvest Area "2"** reserve 140 ft square basal area per acre on 100 trees per acre.

   Density management prescriptions would be the same for Matrix and Riparian Reserve LUA in **harvest area one**. Thin from below, harvesting trees from the suppressed, intermediate and co-dominate crown classes. This generally reserves larger diameter, more vigorous trees from dominant and co-dominant crown classes. Tree spacing would vary as needed to reserve larger trees. Hardwoods and snags would be reserved where possible. All cedar trees would be reserved. In **Harvest Area "1"** reserve 90 – 100ft square basal area per acre on 60 trees per acre.

2. Snags and large remnant trees would be retained undamaged when possible and would not be cut, except those in temporary road construction right of ways, landings and yarding corridors, and those posing a safety hazard. Directional falling and yarding would be utilized to protect snags and large remnant trees consistent with State safety practices. If these are felled for the above reasons, they would be retained on site as coarse woody debris.

3. All road construction and harvesting equipment would be washed prior to arrival at the designated site to prevent import and spread of noxious weeds. Equipment will be washed at the project site prior to leaving the area both at seasonal shut-downs and at the completion of harvest and road closure activities.

4. Ground-based yarding operations can only occur where designated (see **Appendix C for map**). Use of all of the following requirements for ground-based yarding systems would keep soil impacts/compaction within RMP standards:

   - Restrict yarding to seasonally dry periods when soil moisture content provides the most resistance to compaction, typically between 25 to 35%. This is usually June 1st through October 15th.

   - Preplan (map) and designate (flag) all skid trails to occupy less than 10% of the harvest area.

- Require felling of trees to lead to the skid trails. Maximize winching distances and distances between trails at a minimum of 150 feet where feasible. Use existing skid roads whenever possible.

- Till all compacted skid trails and temporary native surface roads with an excavator to a depth of 24 inches, when soil moisture is appropriate. Bring slash and brush to scatter across dirt surface of tilled skid roads. If tillage cannot be accomplished the same operating season, all skid trails and temporary native surface roads would be left in an erosion resistant condition and blocked prior to the onset of wet weather. This would include construction of drainage dips, water bars, lead off ditches and brush piles.

- Use of low ground pressure (<6 psi) ground-based yarding equipment would be limited to one round trip when operating on any area outside designated primary skid trails utilizing down slash to minimize soil disturbance.

- All skid trails would be limited to 12 feet in width or less. Excavation on skid trails would not exceed a maximum of one foot in depth.

5. Other methods of ground-based cutting (feller buncher, harvester processor, cut-to-length systems) may be used.

    - Movement would be limited off of primary skid trails to a single pass.

6. Retain all class 3, 4, and 5 coarse woody debris (CWD). Minimize damage to coarse woody debris where possible. Place cable corridors on the landscape so as to minimize disturbance to CWD > 30" in diameter where possible.

7. Directional felling and yarding would be used for the protection of retention trees, snags, down logs, wetlands and reserve areas.

8. Management activities would be altered according to RMP standards and guidelines and BLM policy if any cultural resources or special status plants or wildlife (including threatened and endangered, Survey & Manage or E-4 Special Provision species) are found in or affected by harvest or associated activities.

9. Retain all Pacific Yew trees, hardwoods and cedars in the Matrix and RR's except where necessary to accommodate safety and logging systems.

10. All cable yarding would be to designated or approved landings.

    - Cable corridors would be kept approximately 150 feet apart to minimize impacts to reserve trees and would be limited to 12 feet in width. (A cable system capable of lateral yarding 75 feet would be used.)

    - A minimum of one-end suspension would be required when cable yarding. Intermediate supports may be necessary to achieve the required suspension.

- Cable yarding corridors would be made erosion resistant if needed where severe gouging has occurred.

11. Ground-based yarding operations would only occur in designated ground-based yarding areas (see map). No ground-based yarding would occur within Riparian Reserves except as noted in harvest area 1.

12. All ground-based yarding would be limited to slopes less than 35% with approval from the Authorized Officer. All ground-based yarding would be to designated or approved landings.

**Design Features For Harvesting in Riparian Reserves**

13. Ground-based yarding operations can only occur where designated (see Appendix C for map). Use of all of the following requirements for ground-based yarding systems would keep soil impacts/compaction within RMP standards:

    - There would be no ground based yarding equipment in the Riparian Reserves, except where designated on the map in "Appendix C" harvest area 1. In harvest area 1, skid roads would be placed no closer than 75' from the posted boundary in the Riparian Reserve. This would keep any yarding equipment 225' from the fish bearing stream #30 and 150' from the non-fish bearing stream #13.

    - No landings would be used or constructed in the Riparian Reserves, except in harvest area #1.

    - There would be no thinning within 75' of wetlands greater than an acre.

    - Machinery would not enter within 75' of wetlands less than an acre.

14. Perennial and intermittent non-fish bearing streams retain the interim Riparian Reserve width of one site potential tree height (200 feet slope distance) on each side of the stream channels. All fish bearing streams retain the interim Riparian Reserve width of two site potential tree heights (400 feet slope distance) on each side of the stream channels. All designated density management areas will have a riparian buffer width (no cut buffer) of approximately 75 feet or 150 feet from the stream as shown on the Map in **Appendix C**.

**Design Features For Road Construction, Road Improvements, and Road Decommissioning**

15. All road construction and harvesting equipment would be washed prior to arrival at the designated site to prevent import and spread of noxious weeds. Equipment will be washed at the project site prior to leaving the area both at seasonal shut-downs and at the completion of harvest and road closure activities.

16. New construction, existing road upgrade work, and harvest operations conducted from native surface roads would be limited to the dry season (generally between June 1 and October 15).

17. Timing of work on roads without stream crossings is subject to soil moisture conditions. Major culvert installation (sites 4 and 8) would be limited to the period July 1- Sept.15 to minimize

sedimentation and adverse effects of sediment on aquatic life. Use logs or small diameter culverts covered by common material as a compacted running surface at temporary stream crossing locations.

18. For harvest area #1, install, use, and remove the two temporary crossings the same season. Complete stream restoration before the first winter after construction. Silt fences or straw bales will be used to minimize sediment transport from the excavation area to down stream locations. Waterbars, drainage dips and/or lead off ditches may be required to create an erosion resistant condition on roads used for harvesting during seasonal shut-down periods.

    - The placement and removal of temporary log fills across streams (S) 11-13 and S 11-14 would be required during the same dry season (low flow conditions- generally between June 15 to Sept.15) to avoid bank failure during high flow (fall/winter) conditions. The alternative for these sites is the use of temporary corrugated metal pipes. Spill containment kits would be required during stream bank/channel restoration and a spill containment plan would be developed prior to operations. Best management practices would be followed to reduce the risk of hazardous material contamination to streams.

19. Road Closures: In channel work is to be conducted during low flow periods (June 15 to October 15) prior to fall rains. Silt fences or straw bales will be used to minimize sediment transport from the excavation area to down stream locations. At stream crossings, re-contour the channel side slopes and seed or plant exposed soils with native plant species in conjunction with erosion control blankets or mulch. Rock and large wood may be placed in the stream channel to simulate natural conditions. Pipes removed would be recycled.

    - Common material would be disposed of along the closed road at a distance at least 50 feet from streams and tilled into the road prism where appropriate.

    - Four designated areas would be used to place common material from culvert replacements. They are: Spur B, Rd.# 21-3-33 south of culvert #3, on Rd. # 22-3-11.1 north of culvert #8 in section 11, and on Rd.# 22-3-11.1 north of spur F about ¼ mile. If fill material is under 10 cubic yards an area close to the project area would be used but not adjacent to a stream or ditchline.

    - Where subgrade conditions warrant, compacted road surface would be tilled. If closed roads are not tilled (i.e. excessive rock, etc.), construct drainage dips, water bars or lead-off ditches to direct surface water to the forest floor and otherwise leave the road in an erosion resistant condition. Use adequate water bar, drain dip, or lead-off ditch spacing based on road gradient and erosion class as per ROD-BMP's.

    - Construct earthen barricades with brush or slash additions to adequately limit off-highway vehicle traffic.

**Design Features for Fuels Treatment**

20. Tracked equipment (i.e. hydraulic excavator) would be restricted to travel only on all weather gravel roadways so piling and subsequent burning and chunking (ideally with the excavator on site) can occur during wet winter months without causing soil displacement in the Area.

21. Slash cleanup and disposal will be restricted to within 25 feet of the roadway edge (approx. maximum boom length) to insure no tracked entry into the Area. Slash to be piled will be comprised of dead and downed woody material, both natural and activity- created. Excluded from piling will be large course woody debris (sound and rotten logs >20 in. diameter), root wads, and live vegetation.

22. On primary gravel roadways only, sound large coarse woody logs, activity-created, and root wads will be lifted and placed in the area at maximum boom length to eliminate roadside high-intensity heat sources. Rotten large coarse woody logs (established) will be left in place. Ideally, roadside piles will not be utilized for wildlife habitat as unburned piles would compromise the objective of securing safer access and egress for the public and firefighting resources should a fire occur within the project Area.

23. Piles and fuel concentrations on temporary roads and landings that are not designated for excavator cleanup would be covered during the summer months and burned in the late fall (normally November and December) when fire season has ended and soil and duff moistures are high, but before conditions become too wet to insure adequate fuel consumption.

# APPENDIX B

**HARVEST AREA DETAILS FOR ALTERNATIVE II - PROPOSED ACTION**

| Harvest Area | Land Use Allocation | Total Acres | Volume/Acre (MBF) | Total Volume (MBF) | Treatment Type | Harvest System & Acres | Timber Age |
|---|---|---|---|---|---|---|---|
| 1 | Matrix | 6 | 15.2 | 91 | Thinning | Grnd. Base – 6 | 43-53 |
| 1 | Riparian Reserve | 32 | 15.2 | 486 | Density Mgt. | Grnd. Base - 32 | 43-53 |
| 2 | Matrix | 369 | 11.4 | 4175 | Thinning | Grnd. Base -164<br>Cable – 205 | 43-53 |
| 2 | Riparian Reserve | 166 | 11.4 | 1925 | Density Mgt. | Grnd. Base – 0<br>Cable - 166 | 43-53 |
| | TOTAL | 573 | | 6677 | | Grnd. Base -202<br>Cable - 371 | |

Matrix= land use allocation
RR = riparian reserve

## ROAD CONSTRUCTION AND CLOSURE SUMMARY
## FOR ALTERNATIVE II - PROPOSED ACTION

| Harvest Area # | Road No. | *Temp. Road Constr. (Miles) | Improvement on Existing Road (Miles) | **Existing Road Decom. (Miles) | Log Culverts Removed | Temporary Culverts Installed & Removed | Culvert Upgrade to 100 year Standards |
|---|---|---|---|---|---|---|---|
| 1 | Spur M | 0 | 0.47 | 0.47 | 0 | 0 | |
| 2 | Spur A | 0.13 | 0 | 0 | 0 | 0 | |
| 2 | Spur B | 0 | 0.09 | 0.09 | 0 | 0 | |
| 2 | Spur D | 0 | 0.13 | 0.13 | 0 | 0 | |
| 2 | Spur F | 0.15 | 0.09 | 0 | 0 | 0 | |
| 2 | Spur G | 0 | 0.06 | 0.06 | 0 | 0 | |
| 2 | Spur I | 0 | 0.25 | 0.25 | 0 | 0 | |
| 2 | Spur J | 0 | 0.08 | 0.08 | 0 | 0 | |
| 2 | Spur K | 0 | 0.09 | 0.09 | 0 | 0 | |
| 2 | Spur L | 0 | 0.08 | 0.08 | 0 | 0 | |
| 2 | Spur M | 0.30 | 0 | 0 | 0 | 2 | |
| 2 | Spur O | 0.06 | 0 | 0 | 0 | 0 | |
| 2 | Spur P | 0.08 | 0 | 0 | 0 | 0 | |
| 2 | Spur Q | 0.13 | 0.38 | 0 | 0 | 0 | |
| 2 | 21-3-33 | 0 | 1.00 | 0 | 1 | 0 | 3 culverts + 1cross drain |
| 2 | 22-3-11.1 | 0 | 0 | 0 | 0 | 0 | 4 |
| 2 | 22-3-11.2 | 0 | 0.80 | 0.8 | 0 | 0 | |
| 2 | 22-3-11.3 | 0 | 0.60 | 0.57 | 0 | 0 | |
| 2 | 22-3-11.4 | 0 | 0.25 | 0.25 | 0 | 0 | |
| 2 | 22-3-2 | 0 | 0 | 0.10 | 1 | 0 | |

*** Roads would be fully decommissioned.**
****Roads would be decommissioned.**

## HARVEST AREA DETAILS FOR ALTERNATIVE III

| Harvest Area | Land Use Allocation | Total Acres | Volume/Acre (MBF) | Total Volume (MBF) | Treatment Type | Harvest System & Acres | Timber Age |
|---|---|---|---|---|---|---|---|
| **2** | **Matrix** | **361** | **11.4** | **4115** | **Thinning** | **Cable – 202**<br>**Grnd. Base - 159** | **43-53** |

Matrix= land use allocation RR = riparian reserve

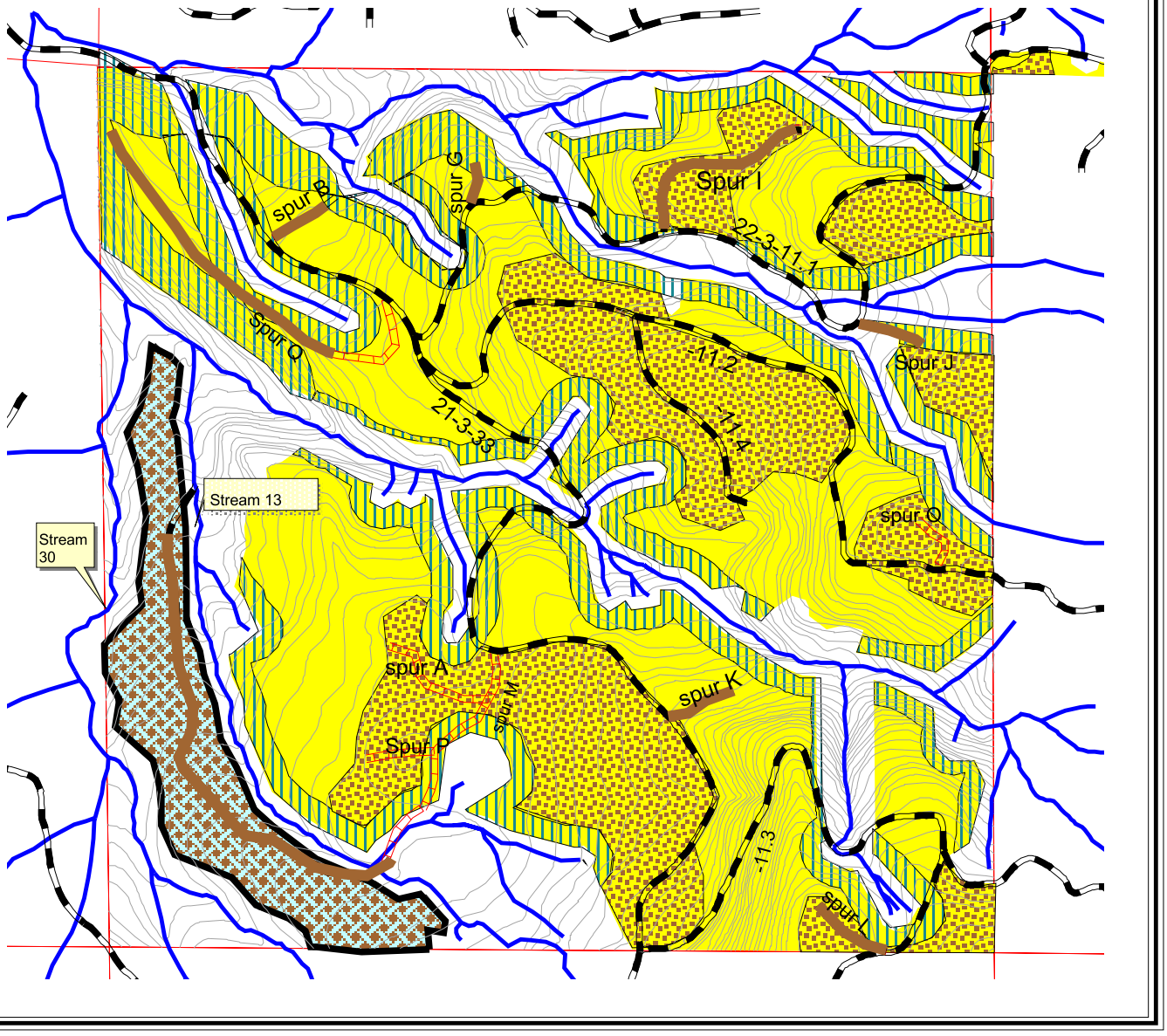
## ROAD CONSTRUCTION AND CLOSURE SUMMARY FOR ALTERNATIVE III

| Harvest Area # | Road No. | *Temp. Road Constr. (Miles) | Improvement on Existing Road (Miles) | Existing Road Decom. (Miles) | Log Culverts Removed | Temporary Culverts Installed & Removed | Culvert Upgrade to 100 year Standards |
|---|---|---|---|---|---|---|---|
| 2 | Spur A | 0.13 | 0 | 0 | 0 | 0 | |
| 2 | Spur B | 0 | 0.09 | 0.09 | 0 | 0 | |
| 2 | Spur D | 0 | 0.13 | 0.13 | 0 | 0 | |
| 2 | Spur F | 0.15 | 0.09 | 0 | 0 | 0 | |
| 2 | Spur G | 0 | 0.06 | 0.06 | 0 | 0 | |
| 2 | Spur I | 0 | 0.25 | 0.25 | 0 | 0 | |
| 2 | Spur J | 0 | 0.08 | 0.08 | 0 | 0 | |
| 2 | Spur K | 0 | 0.09 | 0.09 | 0 | 0 | |
| 2 | Spur L | 0 | 0.08 | 0.08 | 0 | 0 | |
| 2 | Spur O | 0.06 | 0 | 0 | 0 | 0 | |
| 2 | Spur P | 0.23 | 0 | 0 | 0 | 0 | |
| 2 | Spur Q | 0.13 | 0.38 | 0 | 0 | 0 | |
| 2 | 21-3-33 | 0 | 1.00 | 0 | 1 | 0 | 3 culverts + 1cross drain |
| 2 | 22-3-11.1 | 0 | 0 | 0 | 0 | 0 | 4 |
| 2 | 22-3-11.2 | 0 | 0.80 | 0.8 | 0 | 0 | |
| 2 | 22-3-11.3 | 0 | 0.60 | 0.57 | 0 | 0 | |
| 2 | 22-3-11.4 | 0 | 0.25 | 0.25 | 0 | 0 | |
| 2 | 22-3-2 | 0 | 0 | 0.10 | 1 | 0 | |

*** Roads would be fully decommissioned. **Roads would be decommissioned.**

# APPENDIX C

MAPS AND LOCATION OF ROAD CONSTRUCTION
AND HARVESTING FOR ALL ACTION ALTERNATIVES




| Treatment Area - Section 11 | |
|---|---|
| Area 1 | |
| Matrix | 6 acres |
| Riparian Reserve | 32 acres |
| Area 2 | |
| Matrix | 274 acres |
| Riparian Reserve | 128 acres |
| **Total** | **440 acres** |
| Ground Based Treatment Area | |
| Matrix | 115 acres |

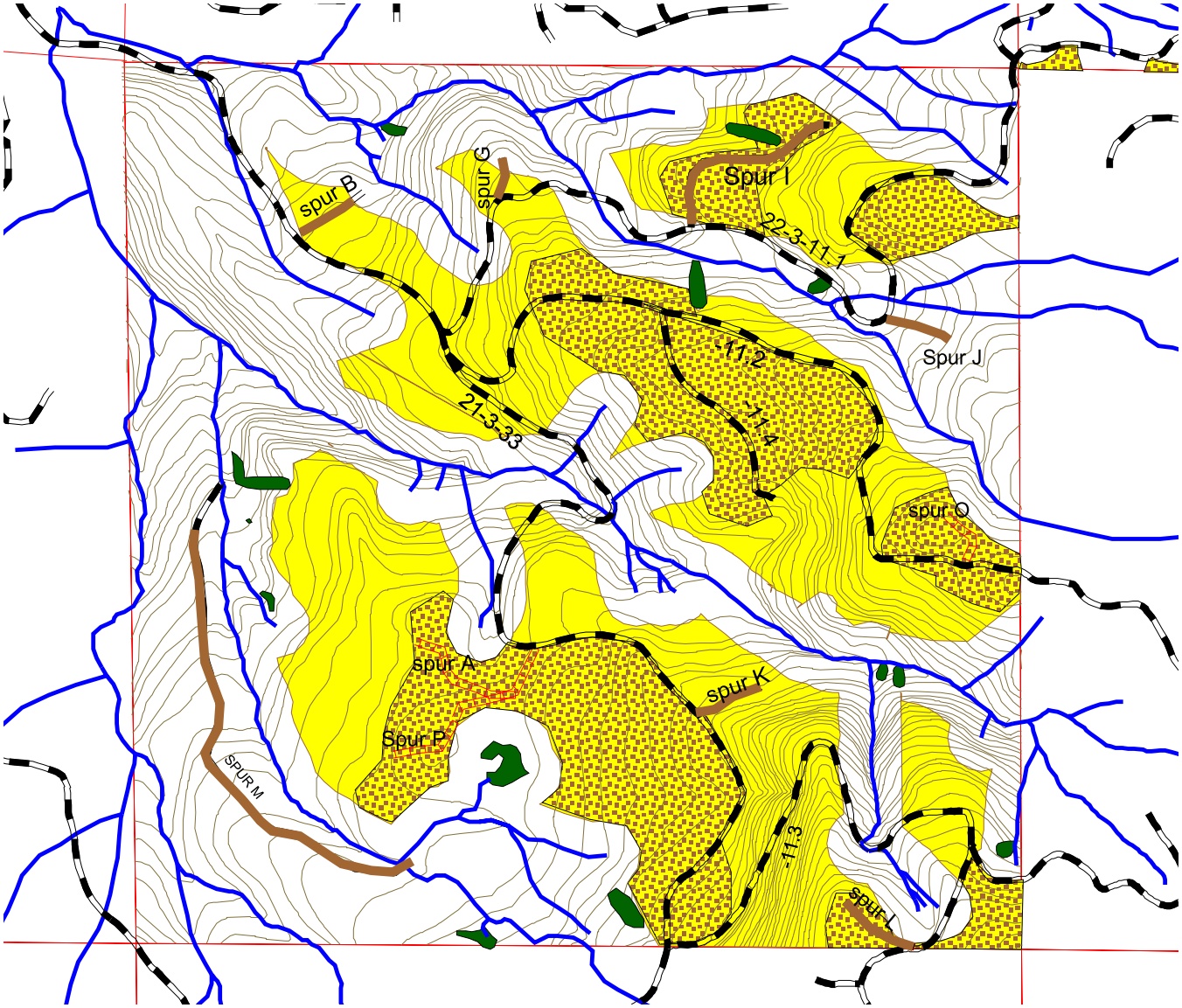
# BRUSH MOUNTAIN
## Alternative 2, Proposed Action
## T.22S., R03W., SEC 11

- Existing Dirt Spurs
- Existing Rock Roads
- New Temporary Spurs
- Streams
- 20' Countour Interval
- Treatment Area 1, Ground Based Yarding
- Ground base yarding
- Riparian Rerserve
- Treatment Area 2
- Section lines

500 0 500 1000 Feet

1" = 1000 ft

N W E S




Treatment Area - Section 11

| | |
|---|---|
| Matrix | 266 acres |
| **Total** | **266 acres** |

Ground Based Treatment Area

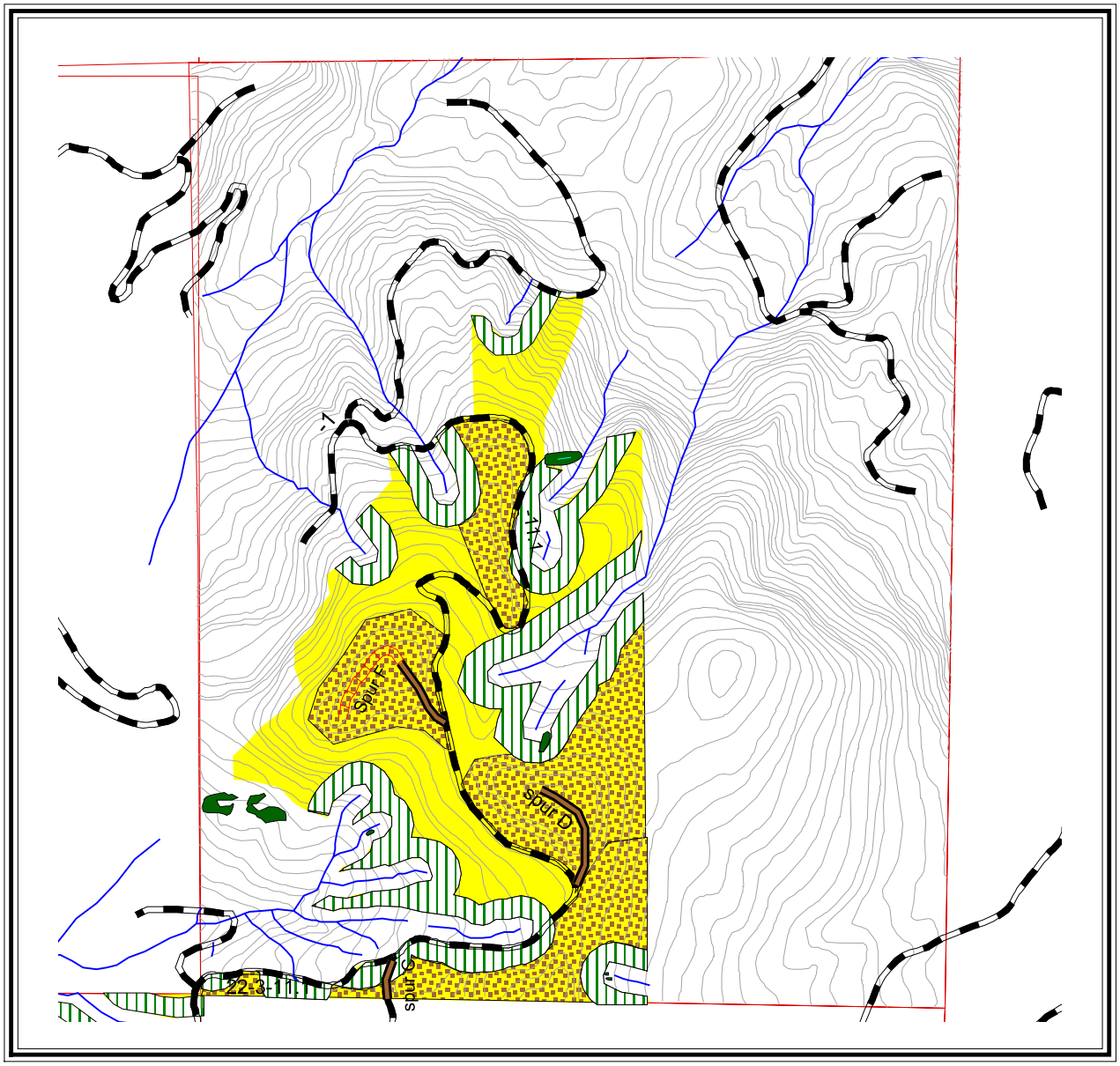
| | |
|---|---|
| Matrix | 110 acres |

# Brush Mountain
# Alternative 3
# No Riparian Reserve Treatment
# T20S.,R.03W., Sec 11

- Existing Dirt Spurs
- Existing Rock Roads
- New Temporary Spurs
- Streams
- Wetlands
- 20' Contour interval
- Ground base yarding
- Treatment Area
- Sections

500 0 500 1000 Feet

1" = 1000'




| Treatment Area - Section 1 | |
|---|---|
| Matrix | 95 acres |
| Riparian Reserve | 38 acres |
| **Total** | **133 acres** |

| Ground base Treatment Area | |
|---|---|
| Matrix | 49 acres |

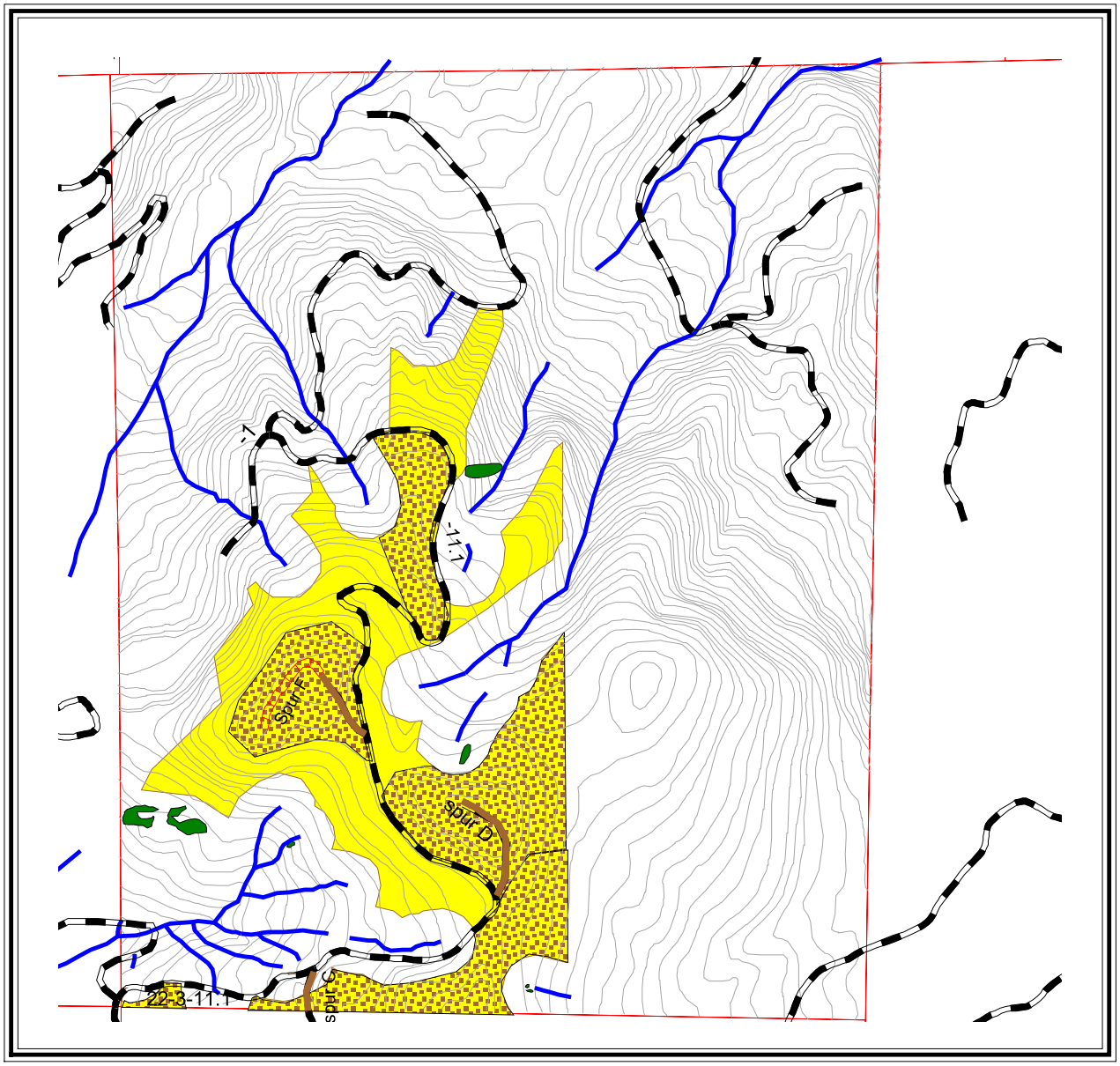
# Brush Mountain
# Alternative 2, Proposed Action
# T.20S.,R.,03W., Sec 1

- Existing Dirt Spurs
- Existing Rock Roads
- New Temporary Spurs
- Streams
- Springs
- Wetlands
- Riparian Reserve
- 20' Contour Intervals
- Ground base Yarding
- Treatment Area
- Sections Lines

500 0 500 1000 Feet

1" = 1000 ft

N
W E
S




Treatment Area - Section 1

| | |
|---|---|
| Matrix | 95 acres |
| Total | 95 acres |

Ground base Treatment Area

| | |
|---|---|
| Matrix | 49 acres |

# Brush Mountain
# Alternative 3
# No Riparian Reserve Treatment
# T.20S.,R.,03W., Sec 1

- Existing Dirt Spurs
- Existing Rock Roads
- New Temporary Spurs
- Streams
- Wetlands
- 20' Contour Interval
- Ground base yarding
- Treatment Area
- Sections

500 0 500 1000 Feet

1" = 1000 ft

N
W E
S

**1792A**
**OR-090-EA-03-12**

**UNITED STATES DEPARTMENT OF INTERIOR**
**BUREAU OF LAND MANAGEMENT**
**EUGENE DISTRICT OFFICE**

# Finding of No Significant Impact for Brush Mountain Timber Sale

Determination:

On the basis of the information contained in the attached Environmental Assessment, and all other information available to me, it is my determination that implementation of the proposed action or alternative will not have significant environmental impacts not already addressed in the *Record of Decision (ROD) for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (April 1994) and the Eugene District Record of Decision and Resource Management Plan (June 1995)*, and the Record of Decision for *Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (2001) with which this EA is in conformance, and does not, in and of itself, constitute a major federal action having significant effect on the quality of the human environment. Therefore, a new environmental impact statement or supplement to the existing environmental impact statement is not necessary and will not be prepared.

Field Manager, Upper Willamette Resource Area _____ Date