# Lower East Fork Coquille Environmental Analysis

Myrtlewood Resource Area

Coos Bay District

EA Number OR 128 – 02 - 01

Table of Contents

# 1.0 Purpose and Need

The Bureau of Land Management (BLM), Myrtlewood Resource Area has identified approximately 211 acres for timber harvest and restorative forest management in the Lower East Fork Coquille Analysis Area. These 30 to 50 year old mixed conifer and mixed hardwood stands were identified for treatment using the East Fork Coquille Watershed Analysis, stand exam information, and an interdisciplinary team review. All areas identified for harvest are the result of past logging practices and the treatments proposed are a necessary and anticipated step in the continuing management of these stands. Without the appropriate treatment at the appropriate time these dense plantations start to rapidly decline in growth and vigor resulting in a stagnant stand that becomes susceptible to wind, insects, and disease. Ultimately the spread of insects, and disease may jeopardize the health of adjacent forests.

The current condition of the identified stands, including uniform structure, undesirable species composition, heavy stocking, slow growth rates, and reduced stand vigor, demonstrate the need for action. Research indicates that stands that develop at very high densities have a limited variation in tree size, which makes them susceptible to diameter growth stagnation and instability (Wilson & Oliver 2000). Leaving the stands in their current condition would prevent or retard the attainment of the objectives established in the *Final - Coos Bay District Resource Management Plan and Environmental Impact Statement* and its *Record of Decision*, (RMP-ROD) (USDI-BLM, 1995) for the respective land use allocations. The proposed treatments include Commercial Thinning (138 acres) and Density Management (73 acres).

The purpose of Commercial Thinning (CT) within the Matrix Land Use Allocation is to provide a sustainable supply of timber, manage developing stands to promote tree survival and growth while maintaining a balance between wood volume, wood quality and timber value, and to reduce the risk of loss from wind, insects, and disease. (USDI-BLM, 1995, p53, 2-58)

The purpose of conducting Density Management Thinning (DMT) within Riparian Reserves is to enhance structural diversity by maintaining or improving tree growth rates and vigor, manipulating species composition, and modifying spatial arrangement. These treatments would accelerate development of characteristics needed to attain objectives contained in the Aquatic Conservation Strategy (ACS) (USDI-BLM, 1995 p13, 2-27.)

The proposed stands are within the Matrix and Riparian Reserve (RR) Land Use Allocations located within Coos County in the Lower East Fork Coquille Analysis Area in Sections 1, 3, 9, 11, 16, 21 of T. 28 S., R. 11 W., Willamette Meridian (see Maps in Appendix 2).

The proposed action would yield an estimated 1.9 million board feet (mmbf) Approximately 1.1 mmbf of this timber volume would contribute to the Coos Bay District's declared objective for an allowable sale quantity (ASQ). Treatments would be accomplished using ground-based and skyline cable yarding systems. The proposed

projects would include construction of (0.55) miles of new road and renovation or improvement of (1.36) miles of existing roads all of which would be decommissioned after use. The proposed projects could be accomplished by timber sale contracts sold in Fiscal Year 2003.

This EA is tiered to the *Final - Coos Bay District Resource Management Plan and Environmental Impact Statement* and its Record of Decision, (USDI-BLM, 1995); which is in conformance with the *Final Supplemental Environmental Impact Statement on Management of Habitat for the Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl* and its Record of Decision (Interagency, 1994) (Northwest Forest Plan) and the *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standard and Guidelines* (Interagency, 2001). The RMP has been determined to be consistent with the standards and guidelines for healthy lands at the land use plan scale and associated timelines.

This EA incorporates by reference *The Western Oregon Program - Management of Competing Vegetation*, (USDI-BLM, 1989); the *Western Oregon Transportation Management Plan,* (USDI-BLM, 1996); and the *East Fork Coquille Watershed Analysis* (USDI-BLM 2000). Actions described in this EA are in conformance with the Aquatic Conservation Strategy (ACS) Objectives listed on page B-11 and the Standards and Guidelines for Riparian Reserves on pages C-31 to C-37 of the Northwest Forest Plan. A detailed analysis of the consistency of the action alternatives with the ACS is contained in Section I of the Analysis File. These documents are available for review at the Coos Bay District Office of the BLM, North Bend, Oregon.

The actions proposed in this EA are consistent with Oregon's Coastal Salmon Restoration Initiative (CSRI), the Coquille Watershed Association Action Plan (CWAAP), and the National Marine Fisheries Service's March 18, 1997 Biological Opinion and Conference Opinion on activities covered in the Coos Bay District's RMP and Biological Opinion number 1-15-00-F-629 for habitat-related impacts to listed wildlife species.

The Analysis File contains additional information (ie, public comments, specialists comments, Aquatic Conservation Strategy Analysis) used by the interdisciplinary team (IDT) to analyze impacts and alternatives and is hereby incorporated by reference.

### 1.1.1. Management Objectives

1. Thin densely stocked young forest stands within the Matrix and Riparian Reserves to enhance the growth and vigor of the residual stand.
2. Manage the forest stand within the Riparian Reserves to acquire desired vegetation characteristics and to facilitate attainment of ACS Objectives (USDI-BLM, 1995p.2-27).
3. Manage the forest stand within the Matrix for the production of merchantable timber through multiple timber sales to address socio-economic commitments.
4. Work toward meeting the Coos Bay District's Allowable Sale Quantity for the fiscal year 2003 as identified in the RMP and the Northwest Forest Plan.

5. Manage the road system within the Lower East Fork Coquille Analysis Area according to the Transportation Management Objectives established in the East Fork Coquille Watershed Analysis.

## 1.2. Scoping

The scoping process identified the agency and public concerns relating to the proposed project and helped define the issues and alternatives that would be examined in detail in the EA. The general public was informed of the planned EA through letters to those on the Resource Area's mailing and e-mail lists, and those receiving the Coos Bay *Planning Update*. The scoping letter, mailing list, and public responses are in Section A of the Analysis File.

## 1.3. Identified Issues

Scoping by the interdisciplinary team (IDT) identified the following major issues that were used to develop and analyze the action alternatives:

Issue 1: Timber Producing capability of forest lands within the Matrix Land Use Allocation

*Key indicators:* - ASQ Volume (MBF)

Issue 2: Riparian Reserve Function – Density management within the Riparian Reserves will have the effect of promoting the development of physical, biological, and environmental characteristics that are important to the attainment of the ACS objectives and the functionality of the Riparian Reserve.

*Key indicators:* -Tree growth rates
-Forest structure

## 1.4. Issues identified, analyzed, but not used to develop action alternatives

The following issues were identified during the EA process. Analysis of these issues did not suggest different alternatives, nor would they influence the decision. Therefore, they were not discussed further in this EA. The reasons that these issues merit exclusion from the body of the EA are included in Section B of the Analysis File.

*Loss of Nitrogen fixation through the removal of Alder in the hardwood conversion stands.*
All potential hardwood conversion stands have been dropped from this action.

*Possible spread of Sudden Oak Death through harvest activities*
The spread of Sudden Oak Death (SOD) has primarily been limited to California. Equipment washing for noxious weeds prior to entering the project area further reduces the likelihood that SOD contaminated dirt or debris will enter the project area.

*Degradation of the scenic quality surrounding Frona Park*

EA unit 5 borders the BPA power line right of way adjacent to Frona Park. A mixed stand of hardwoods and conifers provides a visual screen between the EA unit and the Frona Park County Campground. No part of the proposed action will be visible from the campground. No trails lead from the campground into the area to be commercially thinned.

*Effects of stand management on commercial mushroom harvest.*

*C*ommercial thinning operations will affect the mushroom population in the planned units. However, untreated areas in and adjacent to the harvest units along with the large amount of similar stands across the Analysis Area will insure adequate area for mushroom harvest.

*Sediment Delivery/Sediment Filtering*

Prevention of sediment is an issue common to virtually all action alternatives, regardless of project type. In the case of this analysis, sediment prevention has been designed into the proposed action to the point where another alternative strictly addressing sediment issues was deemed unnecessary. The combination of relatively gentle slopes, high water/soil infiltration rates, prescription of no-treatment areas adjacent to all streams, prescription of directional falling away from streams, prescription of dry season operation for ground-based harvest equipment, as well as dry season hauling - all result in an action that would result in no additional sources of sediment delivery and virtually no detectable contribution of sediment to the aquatic environment.

## 1.5. Alternatives considered but eliminated from further discussion

Alternatives and units considered but eliminated are summarized here and are addressed fully in Section C of the Analysis File.

### 1.5.1. Alternative to treat Riparian Reserves and leave the thinned trees on site.

Based on fire and insect risk assessments, it was determined that removal of the thinned trees (except those left for down logs) would best promote the desired forest structure while minimizing the risk to the stands, the adjacent reserves, and the adjacent private lands.

### 1.5.2. Alternative to treat stands only in the Matrix and perform no density management within the Riparian Reserves.

Although the objectives of treating stands in the Matrix and Riparian Reserves may differ, the mechanism and results are the same. Avoiding treatments in Riparian Reserves forgoes opportunities to accelerate attainment of ACS objectives.

# 2.0 Alternatives Including the proposed action

This chapter provides a description of each alternative. Other, more specific details can be found in Appendix 1, 2, and 3 and the Analysis File, Section C. This chapter will also summarize the environmental consequences of the alternatives.

## 2.1. Alternative I – No Action

Under this alternative none of the actions proposed in the Lower East Fork Coquille Analysis Area would occur. The commercial thinning areas identified for treatment would not be harvested and would not contribute to the District allowable sale quantity. Stands would continue to move towards instability, growth stagnation, and increased risk from wind, insect, and disease damage. The density management treatments within the riparian reserves designed to improve habitat conditions for riparian dependent/associated species would not be applied. Current stand densities and composition would remain the same. Growth, development, and maturation of these stands would continue along present trajectories.

None of the proposed new road construction or road renovation would occur. Roads becoming congested with vegetation that are identified to be renovated would likely continue to self close. Existing roads that are currently closed due to vegetation would remain so.

Road decommissioning opportunities identified in this analysis and the recommendations for road decommissioning/closure in the East Fork Coquille Watershed Analysis (Appendix J) would not be undertaken. These would require separate analysis of environmental consequences and be accomplished under separate authorizations.

## 2.2. Alternative II – Proposed Action

This alternative proposes to commercially thin 10 units within the Matrix Land Use Allocation equaling 138 acres. Density management treatments within Riparian Reserves (73 ac.) are associated with all harvest units except EA unit 8. Harvest unit details can be found in Appendix 2.

**Table 2.1.** Treatment Summary Table

| Total Harvest Acres | CT Treatment Acres W/in Matrix | DM Acres W/in Rip. Res. | CT Estimated Volume (MBF) | Rip. Res. Estimated Volume (MBF) |
|---|---|---|---|---|
| 211 | 138 | 73 | 1058 | 838 |

*CT = Commercial thinning harvest treatment*
*DM = Density Management treatment*
*Rip. Res. = Riparian Reserve*

**Table 2.2**. Road Summary

| Proposed New Roads | | Existing Roads | | | |
|---|---|---|---|---|---|
| **Construction Miles** | **Closure Miles** | **Renovation or Improvement** | **Miles** | **Miles of Decom.** | **Gated Road Miles** |
| 0.55 | 0.55 | 28-11-3.4 | 0.23 | 0.23 | |
| | | 28-11-3.5 | 0.27 | 0.27 | |
| | | 28-11-9.3 | 0.21 | 0.32 | |
| | | 28-11-9.5A & B | | | 0.15 |
| | | 28-11-9.6 | 0.1 | 0.1 | |
| | | 28-11-11.0A1 | 0.1 | | 1.00 |
| | | 28-11-20.2B | 0.45 | 0.9 | |
| **0.55** | **0.55** | | **1.36** | **1.82** | **1.15** |

Decom. = Decommissioned roads (Blocked and left in a condition to self-maintain. May require removal of stream crossing pipes).

All intermittent and perennial, non fish-bearing streams retain the interim Riparian Reserve widths of 220 feet (one site potential tree height – Appendix L East Fork Coquille Watershed Analysis) on each side of stream channels. All fish-bearing streams retain the interim Riparian Reserve widths of 440 feet on each side of stream channels.

Commercial thinning (CT) in the Matrix would retain approximately 71-235 trees/acre throughout the units according to the prescription. Spacing would vary throughout the thinning units, and hardwoods would be thinned along with conifer. Stands would be thinned from below; primarily removing trees in the suppressed and intermediate canopy classes with some co-dominate trees removed where feasible. All existing snags and down logs would be retained unless they pose an unacceptable safety risk. These prescriptions are designed to continue to promote the development of intensively managed forests for the purpose of timber production while meeting other resource objectives (Section D of the Analysis File).

Young stands in Riparian Reserves would be treated by retaining approximately 44 –228 conifer trees/acre throughout the reserves. Stands would be thinned from below, primarily removing trees in the suppressed and intermediate canopy classes with some co-dominate trees removed where feasible (Section D of the Analysis File). No-treatment buffers would be established along all streams; however, skyline corridors through the Riparian Reserves may be needed. Full log suspension would be required over the stream channels. All existing snags and down logs would be retained unless they pose an unacceptable safety risk. In addition, 2 snags and 3 down logs per acre will be provided following harvest. Treatments in Riparian Reserves are designed to accelerate development of late-successional forest characteristics and improve habitat conditions for riparian dependent/associated species.

EA units 3, 4, 6, 7, 8, 9, & 23 would be harvested using a skyline cable system capable of one-end log suspension. EA units 5, 17, & 29 would be harvested using a ground based cut-to-length system that allows for the logs to be transported free and clear of the ground. Cutting of trees will either be done manually with chainsaws or with a mechanical harvester. One-end log suspension would be required during inhaul for the skyline cable system. None of the units require tailhold or guyline anchors in Late-Successional Reserves (LSR) or occupied murrelet habitat. Marbled Murrelet seasonal restrictions and daily timing restrictions for timber harvesting would be in place on EA units 3, 5, and 29 due to their proximity to occupied murrelet habitat.

All new road construction is outside Riparian Reserves and will be decommissioned after harvest as needed to restore pre-road hydrologic function. These semi-permanent roads (as defined by NMFS, 1997) are expected to be open for up to 3 years, but seeded, mulched and drained prior to each wet season (i.e., winterized). Road No. 28-11-9.3 into EA unit 6 will require the construction of an armored water dip. The IDT felt that trying to repair or replace the existing culvert could lead to a higher likelihood that the fill area would fail.

Appendix 2 contains detailed unit descriptions and maps showing roads to be constructed, improved, or renovated for this alternative.

# 3.0 Affected Environment

This chapter describes the current (baseline) condition, organized by resources, of the environmental components that could be affected by any of the alternatives if implemented. Additional information can be found in the resource specialist's reports in the Analysis File and in the East Fork Coquille Watershed Analysis.

## 3.1. Timber producing capability of the Matrix (Issue 1)

The purpose of the Matrix Land Use Allocation is to produce a sustainable supply of timber and other forest commodities while providing for important ecological functions (Interagency, 1994, p22). All or portions of the proposed units are within the Matrix Land Use Allocation. Almost 70% of the Matrix acres in the Analysis Area have been previously harvested and subsequently intensively managed to maximize timber production. As a result the stands affected are comprised of 90% Douglas-fir with stocking levels exceeding 450 trees/acre in some areas. Uniform structure, closed canopies, high densities, and very little understory vegetation characterize these stands.

*ASQ* – This stand condition represents most of the acres in the Analysis Area. Treatment of these stands will allow the maximization of timber production in the matrix on a sustainable basis. The Coos Bay District ASQ is derived by determining a level of non-diminishing supply of timber volume that can be produced in perpetuity from Matrix lands. Currently that level is 27 mmbf per year. Growth modelling using the stand projection system (SPS) shows that the current condition of the conifer stands will lead to a decrease in growth rate and subsequent high mortality rates from competition.

## 3.2. Riparian Reserve Function (Issue 2)

The Riparian Reserves are the land base component of the Aquatic Conservation Strategy (Interagency, 1994, pB-9). Riparian Reserve widths for the Analysis Area are the interim widths outlined in the RMP. Over 60% of the Riparian Reserve acres in the Analysis Area have been previously harvested and subsequently intensively managed to maximize timber production. As a result the stands affected are comprised of 90% Douglas-fir with stocking levels exceeding 450 trees/acre in some areas. They are characterized by uniform structure, closed canopies, high densities, and very little understory vegetation. Based on research presented in Tappeiner *et al*. (1997), the Riparian Reserves are not on a trajectory that is conducive to development of late-successional/old-growth forest habitat. The conditions found within these Riparian Reserves are the result of a combination of past management activities (harvest, site preparation burning, planting, pre-commercial thinning, and fertilization) and are probably not within the historic range of natural variability. The forest understory within the Riparian Reserves is generally sparse where little light reaches the forest floor. The primary shrub species include: rhododendron (*Rhodendron macrophyllum*), vine maple (*Acer circinatum*), evergreen huckleberry (*Vaccinium ovatum*), and sword fern (*Polystichum munitum).*

**Table 3.1**. Stand Ages and Acres in the Lower East Fork Coquille Analysis Area

| Age Class (years) | Acres Inside Riparian Reserves | | Acres outside Riparian Reserves | | Total acres by Age Class | |
|---|---|---|---|---|---|---|
| 0-30 | 2331 | 34.5% | 2444 | 35.5% | 4776 | 35.0% |
| 31-60 | 1318 | 19.5% | 1237 | 18.0% | 2556 | 18.7% |
| 61-80 | 838 | 12.4% | 1071 | 15.6% | 1910 | 14.0% |
| 81-120 | 892 | 13.2% | 736 | 10.7% | 1629 | 11.9% |
| 120+ | 1341 | 19.8% | 1369 | 19.9% | 2711 | 19.9% |
| Nonforest | 40 | 0.6% | 16 | 0.2% | 56 | 0.4% |
| **Total** | **6762** | 49.5% | **6877** | 50.5% | **13639** | |

*Tree growth rates* – Stand exam information shows that the current average relative density for the stands is 51. Relative density (RD) "expresses the actual density of trees in a stand relative to the theoretical maximum density (RD100) possible for trees of that size" ( Hayes, *et. al.*, 1997). Relative density is a measure used to project when a stand reaches a density where diameter growth begins to decline and suppression mortality increases. At this stage, stands require manipulation in density to maintain a positive growth rate. For Douglas fir, a RD of 55 is at the end of the optimal growth range and tends to result in the onset of growth stagnation and suppression mortality. While some of the strongest trees in the stands have started to differentiate from the rest and are beginning to express dominance, the stands are or will soon be declining in vigor and growth rate due to intense competition. The stand exam information indicates that the current live crown ratio is over 40%. If the ratio is allowed to decrease to 30% or less the general reduction in vigor will cause substantial loss of diameter growth. If the ratio is very low, the recovery after thinning will, at best, be delayed or the tree may even succumb (Smith 1986, p70).

*Forest structure* - Important forest structure components include snags of all sizes (hard & soft), down logs (hard & soft), openings and gaps, large limbs, and canopy differentiation. In general, the more complex a forest stand is the more structure it has. Also, older stands with larger trees generally have more structural components to them. The Riparian Reserves in the Analysis Area are lacking many of the desired structural components. This is due in part because the stands are not mature enough to have developed much structure yet. Also, past management practices such as clearcutting and burning have removed many of the snags and down logs.

Down log inventories conducted in the East Fork Coquille Watershed in mid-seral stands (30-80 years old) suggest that suitable down log volumes are on the low end of the desired range. While the majority of the Riparian Reserves contain low to moderate amounts of soft, embedded down logs from previous harvest; hard down logs with bark intact are less abundant. Only 20% of Riparian Reserves stands in the Analysis Area are greater than 120 years old. It is at this age that trees reach sizes that contribute appreciably to large wood recruitment to streams (Spies et al.1988). Over the next forty years, self-thinning in riparian stands 120-160 years old should begin to provide hard down logs to riparian forests and streams.

Currently the amount of available snags in the Riparian Reserves of the proposed harvest units is estimated at 1.5 snags/acre. Based on snag and down log sampling of 30-80 year old stands in the East Fork Coquille 5$^{th}$ field watershed and extrapolations from Maxwell and Ward (1980), most stands appear deficient in snag habitat.

Small gaps and openings are components that can be found sparingly throughout the Riparian Reserves. However, these are usually not large enough and often become dominated with red alder, which can be beneficial by adding to the species diversity. The lack of large limbs and canopy differentiation at this age is expected; however, according to Tappenier as the stands mature it is unlikely they will develop these favourable structural components.

## 3.3. Soils Resources

Geology – Roseburg and Lookingglass are the geologic formations in the project area, and are predominately sandstone of Tertiary age that grade upward to siltstone. Weathering and erosion of exposed portions of Lookingglass can readily produce sedimentation and turbidity in streams when associated with heavy rainfall and high stream flows. Common associated processes with the two formations are: rapid erosion, stream bank erosion, flash flooding, and mass wasting.

Soils - Most of the soils are moderately-deep to deep loams, silt loams, and sandy loams. They were formed in colluvium and/or residuum, derived from sedimentary rock or sandstone. Infiltration rates are rapid (0.6 - 6.0 in./hr.), and allow for moderate amounts of water storage except when limited by high rock content. Productivity is generally moderate to very high on these soils. Common associated limitations to management of

soils in the proposed units are: susceptibility to compaction, erosion, steepness of slope, windthrow, and landslides.

*Compaction* - Soil productivity can be reduced by ground disturbing activities that result in compaction. Soils are more susceptible to compaction during periods of high soil moisture. In the East Fork Coquille Watershed compacted surfaces are estimated at 3-5% of total area, which includes areas of road and harvest trails from all types of yarding systems (USDI-BLM, 2000). The existing compaction for proposed ground-based units in the Analysis Area ranges from 6% to 14% of unit area. This compaction is the result of preexisting skid trails when the units were harvested more than 30 years ago. Since then, natural recovery in these units has resulted in decompaction of the soil surface to approximately 4-6 inches.

## 3.4. Water Resources

*Water Yield* - The forested watersheds of the Coos Bay District tend to yield large amounts of water; at the same time they require large amounts of water to satisfy evapotranspiration demands. Evapotranspiration is the combination of water lost due to evaporation and water transpired into the atmosphere by plants. It is common for annual evapotranspiration in coniferous forests of western Oregon to reach 25 inches (Beschta 1995). Water yields in western Oregon have been found to return to that of a mature forest stand in about 30-40 years after regeneration harvest (Beschta, 1995; Harr and Cundy, 1990; Stednick and Kern, 1992). All planned units within the Analysis Area consist of forest plantations of the 30-40 year age class re-established following previous harvest. These stands have reached an age where the losses from evapotranspiration on the annual water budget can no longer be attributed to past harvest and is within the historic range of natural variability.

*Flow Regime* - The general flow regime of the Analysis Area is characterized by a high drainage density in conjunction with limited soil water storage capacity causing rapid inputs to the channel network. Stream channels in the project area are generally headwater, steep cascading, and step-pool channels confined by hill slopes. The Analysis Area has a drainage density of 8.0 miles/$mi^2$ (miles of stream per square mile area), however, about 80% of its drainage density consists of $1^{st}$ and $2^{nd}$ order intermittent upland tributaries. In contrast to these streams, the lower main stem of the East Fork Coquille River is a low gradient and low energy depositional stream.

*Peak flow* - By definition, a peak flow is the instantaneous maximum discharge that is generated by an individual storm event. The Lower East Fork Analysis Area is almost entirely below the transient snow zone and peak flows correspond directly to rainfall events. Peak flows for smaller storms (below bankfull 1.2 yr recurrence interval flow) may be slightly elevated due to the density and pattern of existing roads and previous tractor harvest compaction in the Analysis Area. These two conditions would have a less noticeable effect on the peak flows from moderate to severe storm events simply due to magnitude.

*Water quality* – The two components of water quality that are pertinent to the analysis are sediment and water temperature. Natural processes have always contributed some sediment to the stream channels. Sediment delivery and sediment filtering are discussed in Section B of the analysis file. The East Fork Coquille River runs through the Analysis Area and is listed on the Oregon Department of Environmental Quality's (ODEQ) 303(d) list of water quality limited streams for exceeding the standard of 64$^{o}$ F for summer water temperature from river mile 0 to 26.2. This condition may reflect 100 years of riparian forest manipulation (Beschta *et.al*. 1987). Deficiencies in large woody debris, which contribute to creation of deeper and larger pools along with the removal of riparian vegetation, are two factors that have likely affected stream temperatures (USDI-BLM, 2000 p. IV-4). The majority of the stream channels in the project area are generally intermittent during the summer therefore do not appreciably contribute to the summer water temperatures of the East Fork Coquille River.

## 3.5. Wildlife Resources

*Common species* - Numerous species of wildlife are present in the Analysis Area including species of big game, furbearers, small mammals, raptors, migratory birds, reptiles, amphibians, etc. Most of these species are considered common; either they are habitat generalists or their habitats are fairly common. O'Neil *et. al*., (2001) lists the sharp-skinned hawk, golden-crowned kinglet, northwestern salamander, and ruffed grouse as being closely associated with small tree, single story, closed canopy habitats similar to those analyzed in this EA. These species are potentially present in the Analysis Area though none of them live exclusively in this stand type. Across all ownerships in the Analysis Area, these dense young stands are fairly common (17% of the area, Analysis File Section G Table W-1), they probably comprise a larger percentage than they did historically.

*Threatened and Endangered species* - The Analysis Area is within the range of three federally listed threatened species: the northern spotted owl, marbled murrelet, and bald eagle. There are no known threatened or endangered species nest sites or activity centers within the proposed EA units. Four spotted owl nest sites exist in the Analysis Area however none of the units are within 0.25 mile of an owl site. There are 33 occupied murrelet sites partially or wholly within the Analysis Area. EA units 1, 3, 5, and 29 are within distances of marbled murrelet habitat that would require seasonal or daily timing restrictions on harvest related activities. Units 1 and 29 are adjacent to occupied sites. These units are 34-36 years old, and tree heights are < ½ site potential tree height. In addition, critical habitat for northern spotted owl and the marbled murrelet has been designated in the Analysis Area but will be unaffected by any of the alternatives.

*Survey and Manage species* – The Oregon *megomphix* has been placed in a category that does not require pre-disturbance surveys (Interagency 2001 pp.18-19) and Implementation of 2001 S&M Annual Species Review (BLM Instruction Memorandum OR-2002-064). There are no known Oregon *megomphix* sites in any of the proposed units.

Oregon Red Tree Vole (*Arborimus longicaudus*) have been placed in a category that does not require pre-disturbance surveys (Interagency 2001, pp. 18-19) and Implementation of 2001 S&M Annual Species Review (BLM Instruction Memorandum OR-2002-064).

No caves, abandoned buildings, or wooden bridges were found that could be providing bat roost sites, which would require additional protection under the Survey and Mange ROD.

*Open roads/closed roads* - Roads can affect wildlife by creating a physical or perceived barrier to movement, acting as avenues for edge species to invade interior habitats, and by encouraging harassment via vehicle traffic and hunting. Currently there are approximately 98.21 miles of open roads in the analysis are that are on BLM lands or are controlled by BLM on private lands. This equates to an open road density of 4.60 miles/sq. mile. Closed roads equal 8.52 miles with a density of .4-miles/sq. mile. Roads that have grown over with vegetation to become impassable by vehicles are less likely to restrict movements of wildlife species and do not allow the harassment associated with vehicular traffic. Some of these roads may be considered in an open status according to the Transportation Management Objectives (TMO) of the East Fork Coquille Watershed Analysis and so the actual closed road density may be slightly higher.

## 3.6. Aquatic Resources

All streams analyzed are classified as small or medium non-fish, or medium fish bearing according to 1994 Oregon Forest Practice Rules and Statutes (OAR 629-635-200). Proposed commercial thinning units 3 and 5 are adjacent to fish-bearing streams containing coho salmon. All other streams within and/or adjacent to thinning units are non-fish bearing. Aquatic habitat conditions are simple and are likely to remain so until trees in riparian stands grow to larger sizes, and start to enter the stream channel. These larger wood pieces are necessary to form the complex habitat conditions, and stair-stepped channel profiles that have been shown to contribute to healthy aquatic habitat conditions. Some of the aquatic habitat has been altered throughout the East Fork Coquille watershed as a result of sediment delivery from past road construction, timber harvest, stream cleaning, and other activities (USDI-BLM, 2000).

*Common species present* - The lower portion of the East Fork Coquille watershed supports populations of coho salmon, fall chinook salmon, winter steelhead trout, coastal cutthroat trout (migratory and resident populations), Pacific lamprey, brook lamprey, speckled dace, prickly sculpin, and reticulate sculpin. Other species may be present in this area, but have not been documented.

*Threatened and Endangered Species* - The Analysis Area is within the Oregon Coast Evolutionarily Significant Units (ESU) for coho salmon, steelhead, and cutthroat trout. Within this ESU coho salmon are listed as a threatened species. Steelhead and cutthroat trout are considered to be “candidates” for federal listing under the Endangered Species Act (ESA); stock status reviews are ongoing to determine if future listings may be warranted. Additional information on fish stocks can be found on pages IV-28 through IV-41 of the East Fork Coquille Watershed Analysis (USDI-BLM, 2000).

## 3.7. Road Network

*Existing roads* - The existing road network is comprised of BLM maintained all-season gravel roads, seldom-used gravel and dirt roads, private controlled roads, and county roads. Currently the open road density for all roads on BLM lands and BLM roads on private lands in the Analysis Area is 4.60 miles/sq.mile. (Table 3.3)

Most older, seldom used, logging roads on BLM lands are in fairly stable condition; vegetation canopy is closed, herbaceous vegetation and detritus cover most of the road surfaces, and most are not currently impacted by vehicular traffic. These roads are either natural surface roads or gravel surface.

The noxious weeds, which are known to occur within the analysis area, are: French broom, Scotch broom, Himalayan blackberry, Canadian and bull thistles, and gorse. Noxious weed introduction and spread is occurring mostly on disturbed ground along roadsides as a result of vehicle traffic.

Some roads, stream crossing culverts, road drainage culverts, and slide areas at risk of sediment delivery in the Analysis Area have been addressed in recent restoration projects such as Jobs-in-the-Woods. One stream crossing on the 28-11-9.3 road has been identified by the IDT as not functioning properly. The stream channel above the road has been effectively blocked by a debris torrent approximately 20-30 years ago based on the vegetation but has remained stable since then. Some down cutting of the fill slope has been occurring by water flowing over the road surface during periods of high flow.

**Table 3.2** Lower East Fork Coquille Analysis Area Road Miles

| Control | Surface Type | BLM Lands Area (ac.) = 13650 Area (sq.mi.) = 21.33 | | Non-BLM Lands Area (ac.) = 16706 Area (sq.mi.) = 26.10 | | Watershed Totals Area (ac.) = 30356 Area (sq.mi.) = 47.43 | |
|---|---|---|---|---|---|---|---|
| | | Miles | Density | Miles | Density | Miles | Density |
| BLM | BST | 13.43 | 0.63 | 10.93 | 0.42 | 24.36 | 0.51 |
| | Rock | 47.36 | 2.22 | 8.38 | 0.32 | 55.74 | 1.18 |
| | Natural | 4.23 | 0.20 | 0.28 | 0.01 | 4.51 | 0.10 |
| | Unknown | 9.34 | 0.44 | | 0.00 | 9.34 | 0.20 |
| Private | BST | | 0.00 | | 0.00 | 0.00 | 0.00 |
| | Rock | 1.72 | 0.08 | 11.29 | 0.43 | 13.01 | 0.27 |
| | Natural | 1.48 | 0.07 | 8.34 | 0.32 | 9.82 | 0.21 |
| | Unknown | | 0.00 | | 0.00 | 0.00 | 0.00 |
| Other | BST | 0.46 | 0.02 | 15.33 | 0.59 | 15.79 | 0.33 |
| | Rock | 0.60 | 0.03 | 5.47 | 0.21 | 6.07 | 0.13 |
| | Natural | | 0.00 | 0.06 | 0.00 | 0.06 | 0.00 |
| | Unknown | | 0.00 | 57.25 | 2.19 | 57.25 | 1.21 |
| **TOTALS** | | **78.62** | **3.69** | **117.33** | **4.49** | **195.95** | **4.13** |

**Table 3.3** Lower East Fork Coquille Analysis Area Road Densities

| | Road Miles* | Area - BLM lands only (sq.mi.) | Road Density (milesi/sq.mi) |
|---|---|---|---|
| OPEN | 98.21 | 21.33 | 4.60 |
| CLOSED | 8.52 | 21.33 | 0.40 |
| TOTALS | 106.73 | 21.33 | 5.00 |

* Road miles equal all roads on BLM lands and BLM controlled roads on private lands (shaded portion of table 3.2).

*Decommissioned roads* – The East Fork Coquille Watershed Analysis identified roads to be decommissioned as opportunities and funding allow. The roads identified in this action to be decommissioned will be closed on a long-term basis but may be used again in the future. Decommissioning consists of blocking the road to vehicular traffic and leaving the road in a condition to self maintain. This includes water bars, seeding, and stream culvert removal if necessary. Two stream crossing culverts along roads recommended for decommissioning have been identified. The 28-11-9.3 road has been discussed above. The IDT felt that the culvert and the upstream debris deposit are currently stable and pose less of a threat to sediment delivery and failure if left in place. The other stream-crossing culvert is located on the 28-11-20.2 B road. This is an intermittent stream crossing with an adequately sized culvert (48" diameter) that is in good condition. Existing roads that are identified in the TMO for decommissioning or other roads in the Analysis Area that are determined to no longer be needed continue to be decommissioned through alternative funding sources such as Jobs-in-the-Woods.

*New roads* **–** New road construction on BLM lands within the Analysis Area is limited to roads analyzed through the NEPA process to facilitate BLM timber sales and by private timber companies constructing new roads across BLM lands under existing reciprocal right of way agreements. All new roads are constructed according to the Best Management Practices in the RMP. Newer BLM-controlled roads currently pose a low to moderate risk of short-term sediment delivery to streams.

# 4.0 Environmental consequences

This chapter is based on the resource specialist's reports found in the analysis file and provides the analytical basis for the comparisons of the alternatives. The direct, indirect, and cumulative impacts are discussed according to the issues and organized by resources

## 4.1. Effects on the Timber producing capability of the Matrix (Issue 1)

### 4.1.1. Alternative 1 – No Action

Direct/Indirect

*ASQ* - This alternative would not contribute any volume toward the decadal ASQ for the District. Expected harvest of forest stands in the matrix that have been initiated and

maintained for the purpose of producing timber volume would not occur. Using stand growth modeling software (SPS), we can show that the longer the identified stands remain in their overstocked condition the less stable they become and the lower the response to any eventual thinning. Therefore, the treatment window for the most effective response to thinning may be missed with the no action alternative, and plantations would likely decline in growth rate due to increased competition. Furthermore, stands continuing along this course would develop an increased susceptibility to wind and insect/disease damage. This will have an effect both on the scheduled contribution to the ASQ and on any future contributions anticipated from these stands. Research indicates that stands that continue to develop at very high densities have a limited variation in tree size, which makes them susceptible to diameter growth stagnation and instability (Oliver & Wilson 2000). Successfully maintaining the developmental trajectory of these stands depends on applying the appropriate silvicultural treatment within a prescribed time interval. Deferring silvicultural treatments at this time may limit the potential contributions these stands are anticipated to make towards the ASQ. Leaving the stands in their current condition would prevent or retard the attainment of the objectives established in the RMP for the Matrix.

Cumulative effects
The ASQ volume forgone in this alternative may shift priority to other stands identified in the East Fork Coquille Watershed Analysis or to other areas of the District.

### 4.1.2. Alternative 2 – Proposed Action

Direct/Indirect effects
*ASQ* - Under this alternative, the various treatments would result in an estimated timber volume of 1.9 mmbf. However only the 1.1 mmbf of conifer volume from 138 acres of commercial thinning outside of riparian reserves would be chargeable towards the ASQ. Density management on 73 acres will produce approximately 0.8 mmbf, which does not contribute to the ASQ. Table 2.1 and Appendix 2-table 1 summarize volume estimates.

Cumulative Effects:
Commercial thinning in the proposed action will not only provide current ASQ volume but will also allow the stands to contribute to future ASQ commitments either through additional thinning or regeneration harvest. SPS growth modeling shows that the residual trees in most stands commercially thinned at age 30 will increase in growth enough that by age 60 – 80 the volume/acre is approximately the same as if the stand was left untreated.

A contribution to the ASQ is planned from approximately 600 acres of potential regeneration harvest prioritized in The East Fork Coquille Watershed Analysis. Approximately 521 acres of commercial thinning, hardwood conversion, and regeneration harvest were deferred under this action because of poor stocking or because Port Orford Cedar was likely to be present in the units. It is expected that future actions would treat those stands after site-specific analysis at the appropriate time.

It is expected that brush fields and hardwood stands within and adjacent to the Analysis Area would continue to be converted to conifer stands as they are identified thereby increasing the amount of acres that can contribute to the ASQ.

## 4.2. Effects on Riparian Reserve Function (Issue 2)

### 4.2.1. Alternative 1 – No Action

Direct/Indirect effects

*Tree growth rates* - No direct effects to tree growth rates are expected. Under this alternative, 73 acres of Riparian Reserves would remain as densely stocked conifer plantations. At these high densities, trees experience an indirect effect of diameter growth stagnation and instability (Wilson & Oliver 2000). "The struggle for existence in dense, unthinned stands is so fierce that it reduces the growth and vigor of all trees in the stand" (Smith 1986, p. 48).

*Forest Structure* - No direct effects to forest structure are expected. Under this alternative, 73 acres of Riparian Reserves would remain as uniform, single-layered stands with little structural diversity, few snags or broken top trees, and sparse shrub layers. Based on snag and down log sampling of 30-80 year old stands in the East Fork Coquille 5$^{th}$ field watershed and extrapolations from Maxwell and Ward (1980), the Riparian Reserve portion of most plantations are deficient in snag habitat. Mortality of suppressed trees in the Riparian Reserves would continue to provide small diameter, short-lived logs for aquatic and riparian habitats. The development of late-successional forest characteristics (e.g. multi-layered canopies, large diameter trees, large diameter dead wood, diverse structure) would be delayed.

Cumulative effects

The natural processes which currently thin the riparian reserve through growth stagnation and mortality would continue. It has been shown that this process would not lead to the development of the desired riparian condition. Isolated and site specific restoration projects designed to improve habitat conditions and restore Riparian Reserve function have been implemented in the Analysis Area and will likely continue in the future depending upon funding. Projects have included snag and habitat tree creation, riparian planting, culvert replacement, and instream wood placement.

### 4.2.2. Alternative 2 – Proposed Action

Direct/Indirect effects

*Tree growth rates* - Under this alternative, 73 acres (< 2 %) of the Riparian Reserves in the Analysis Area would be thinned to accelerate growth rates and impart diversity in tree spacing. Based on stand data, these stands are dense and overstocked. Thinning would reduce competition between remaining trees and would allow higher growth rates, including limb growth (important for species like marbled murrelets) and canopy development. As a result of thinning and subsequent increase growth of the residual stand, contributions of large wood to riparian reserves and stream systems would be likely to continue, but the material would be of a larger size and would decompose relatively slowly (relative to smaller, suppressed trees).

*Forest Structure* - The increased growth rates, creation of spacing diversity, and snag and down log creation should improve development of late-successional forest characteristics such as multi-layered canopies, large diameter trees, large diameter dead wood (both

instream and forest floor), and diverse structure. The reduced canopy cover would allow more light to penetrate to the forest floor inviting some understory vegetation development. In addition, snags, "broken top" trees (i.e. topped trees with live limbs), and down logs would be created through design features and the logging process to add immediate habitat features important for wildlife. Small diameter snag and down log habitat would increase under this alternative.

While material recruited from stands less than 40 years old contributes organic matter important in food webs, such wood provides little in terms of in-stream structure and channel stability, due to its small diameter and high decay rate. Therefore, density management thinning in Riparian Reserves is not likely to have a substantial impact on functions associated with in-stream down wood in the short term. In the long term (15+ yrs), growth rate of individual trees and the resultant structural diversity of riparian areas are expected to increase in the thinned Riparian Reserves. This would benefit aquatic habitat and channel stability, because larger pieces of woody material would be available for recruitment in a shorter period of time than would occur without thinning. An indirect effect of this action would be a slight short-term reduction in the amount of small woody material available to enter the channel. This short-term reduction is likely to have a negligible effect on aquatic habitat, due to the small scale of the reduction, and the small percentage of aquatic habitat it could potentially influence. In addition, all streams within or adjacent to proposed harvest units have variable width no-treatment zones. These areas would serve to maintain streambank stability, shade, and provide a concentrated, short-term source of smaller woody material available to enter stream channels.

Cumulative effects

Over the long term, density management will improve the large wood recruitment potential, connectivity, and structural diversity within the East Fork Coquille Riparian Reserve network. Proposed density management treatments along with other riparian silviculture projects and in-stream large woody debris restoration projects scattered throughout the East Fork Coquille Watershed serve to increase the overall quality and function of the Riparian Reserve network. Other reasonably foreseeable actions within the Analysis Area on federal lands will likely include commercial timber harvest, additional stream restoration and riparian silviculture projects, wildlife habitat projects, and necessary road related maintenance and repair activities. Overall, projects of this nature are expected to benefit the function of the Riparian Reserve network. Management of private industrial forestlands in accordance with the Oregon Forest Practice Rules will continue. Given the present standards for riparian management under the Oregon Forest Practice Rules, appreciable large wood recruitment from private and industrial forests is unlikely in the foreseeable future.

## 4.3. Effects on Soil Resources

### 4.3.1. Alternative 1 – No Action

Direct/Indirect effects

*Compaction* – This alternative will have no direct or indirect effects on soil compaction.

Cumulative effects
All proposed ground-based units were found to have some present level of compaction ranging from 6% in EA unit 17 to 14% in EA unit 5. Natural recovery in these units has resulted in de-compaction of the soil surface to approximately 4-6 inches. The soil will continue to become less compacted through natural processes under this alternative.

#### 4.3.2. Alternative 2 – Proposed Action

Direct/Indirect effects
*Compaction* – EA units 5, 17, and 29 would be harvested using a ground – based harvesting system. Surface soil layers in these units along skid roads that have started to de-compact through natural processes would likely experience some compaction again during the harvest operation. The design features (Appendix 1) are expected to negate any additional impacts from compaction. By using existing skid trails to the extent possible there will be no increase in the amount of area already compacted. Dry season operation, minimizing the number of passes, and requiring harvesting equipment to operate on a layer of slash would lessen the degree of compaction.

In skyline cable units that have moderate slopes it is anticipated that the trees would be cut using a mechanical harvester. Marganne (1997) in her study of cut-to-length harvesting and soil compaction said there was no evidence that harvester traffic increased bulk density on previously undisturbed soil when traveling over a layer of slash. Bulk density is a standard measure of soil compaction expressed as dry mass/unit of bulk volume. Other design features such as dry season operation and utilizing existing skid trails and roads would result in no measurable compaction to previously undisturbed soil when using a mechanical harvester.

Where multiple passes (more than 4) will be made, main forwarder corridors will be designated utilizing preexisting skid trails. It is therefore estimated if harvesting is done according to the EA design features, that any disturbance due to the cut-to-length system will have a negligible increase in levels of compaction.

Cumulative effects
All proposed ground-based units were found to have some present level of compaction ranging from 6% in EA unit 17 to 14% in EA unit 5. Natural recovery in these units has resulted in de-compaction of the soil surface to approximately 4-6 inches. The soil that is outside of the designated forwarding roads will continue to become less compacted through natural processes under this alternative.

## 4.4. Effects on Water Resources

#### 4.4.1. Alternative 1 – No Action

Direct/Indirect effects
This alternative will have no direct effect on water yields, peak flows, or water quality.

***Water yields*** –The stands within the units would continue the trend toward undisturbed conditions within the historic range of natural variability with respect to annual yield and low flows.

***Peak flow*** - Peak flows from smaller storms (below bankfull 1.2 yr recurrence interval flow) may remain slightly elevated due to the density and pattern of existing roads and previous tractor harvest compaction in the Analysis Area subwatersheds.

***Water quality*** - The East Fork Coquille River exceeds the South Coast Standard of 64$^{o}$ F for summer water temperature from the mouth to the headwaters and is listed on the ODEQ's 303(d) list of water quality limited streams. There would continue to be insufficient large wood recruitment necessary for stream morphology, sediment storage, and floodplain function.

Cumulative effects - The cumulative effects of the no action alternative in respect to streamflow and channel morphology is that some ACS objectives related to roads and riparian function may continue not to be met. The hydrologic function of the watershed would continue its trend toward improvement but at a slow pace. In-stream placement of large woody material and riparian silviculture projects would occur as projects are identified and funding allows.

### 4.4.2. Alternative 2 – Proposed Action

Direct/Indirect effects

***Water yields*** - Thinning increases the short-term water yield of forested watersheds by temporarily reducing the amount of foiliage that transpires and intercepts water. However, selective logging (thinning) yields slighter increases than clear-cutting because the rapid re-growth of the understory, as well as, the overstory react by taking in the available moisture (Rothacher 1971). Harvesting trees for density management within the Riparian Reserves would reduce the initial evapotranspiration rates; however increased vegetation response to thinning may actually increase transpiration (Keppeler 1998). It is known that riparian trees and vegetation use more water than the forested hill slopes (Keppeler 1998). Although short-term fluctuations may occur, selective logging in the Riparian Reserve is not expected to have a discernable effect, if any, on the annual water yield of the Analysis Area .

***Peak flow*** - By definition, a peak flow is the instantaneous maximum discharge that is generated by an individual storm. The forest soils of the Coast Range and Coos Bay District experience large moisture deficits during the summer until they are recharged by fall frontal storms. The Lower East Fork Analysis Area is almost entirely below the transient snow zone and peak flows correspond directly to rainfall events. The potential for changes in peak flows and water yield to affect the frequency and magnitude of stream flows in the project area would be undetectable within the range of natural variability due to the desynchronization of the units across the watershed.

Paired watershed studies in various climate regimes have found that the first precipitation events and consequent peak flows in the fall are usually minute and thus geomorphically

inconsequential to channel morphology (Ziemer 1981; Lewis *et. al.* 1998). Large peak flows occur during midwinter after the soil moisture deficits are satisfied. The size of events that correspond to the discharge at which channel maintenance is most effective are associated with a bankfull stage, which is the incipient elevation on the bank where flooding begins (Rosgen, 1996). These are the flows that tend to modify stream channels while transporting most of the sediment (Ziemer 1998; Lewis *et. al.* 1998). Statistical increases to the already small fall peak flow events have not been proven to modify stream channel form or increase risks to flooding.

***Water quality*** **-** The density management treatments within Riparian Reserves are not expected to increase stream temperature in any stream as a result of the proposed activities. Each stream has been assigned a no-treatment buffer to retain direct overhead shading. In addition, the streams within the project units are considered intermittent/ephemeral thus; do not contribute surface flows during the critical summer months, when peak stream temperatures occur.

The project would require renovation/improvement of 1.36 miles of road and .55 miles of new construction, all of which will be closed and/or decommissioned following harvest (Appendix 3). Some of these existing roads are in close proximity to intermittent streams, thus, there could be potential for slight short-term elevation in sediment delivery to channels during periods of winter haul. However, this can be prevented with the use of specified design features (Appendix 1).

Cumulative effects

The cumulative effects of harvesting timber in the Analysis Area will depend on the magnitude and timing of sediment, large wood, and water inputs to the stream as well as the natural delivery mechanisms that are active in the watershed. Although there may be a potential for small short-term site-specific increases, the effect of forest harvest is likely to be generally undetectable from natural variations.

The potential for various forest practices to cause cumulative effects can materialize at a wide range of spatial and temporal scales. If the accumulation of individual impacts from various forest practices provides the mechanism for causing a particular cumulative effect, then the prevention of potentially adverse impacts to water resources at the project level is of fundamental importance to preventing cumulative effects (Beschta, 1995).

These project units are dispersed across vast tracts of both timber industry and private land ownership that have implemented a pattern of large regeneration harvests of mature, mid seral conifer forest, as well as large tracts of alder. The State of Oregon regulates the size of timber harvest units and the treatment of riparian areas differently than federal agencies. State of Oregon forest practices regulate over half the Analysis Area and allow the removal of riparian vegetation on intermittent/ephemeral streams up to the stream banks. In addition, there are natural processes (landslides, debris torrents, surface erosion), which have contributed to high background levels of sediment delivery, transport, and turbidity in the Analysis Area.

With the Best Management Practices being implemented in the design of the harvesting methods, use of roads, and guidelines for the protection of streams, it is unlikely that the proposed action will have any effect that could measurably add to other activities in the Analysis Area or to the East Fork Coquille River.

## 4.5. Effects on Wildlife Resources

### 4.5.1. Alternative 1 – No Action

Direct/Indirect effects

This alternative will have no direct effect on Threatened and Endangered (T&E), Survey and Manage (S&M), or common species of wildlife or their habitats. Roads that are currently closed and vegetated will remain so and no additional roads will be constructed.

Cumulative effects

The 211 acres of dense, young stands found in the proposed units will continue to develop diverse structure, snags, down logs, and large trees very slowly. As these areas develop and mature they will provide habitat connections to critical areas, nesting areas, LSR's and other suitable habitats.

### 4.5.2. Alternative 2 – Proposed Action

Direct/Indirect effects

***Common species –*** The proposed action will alter 211 acres of 30 – 40 year old timber through commercial thinning. Logging slash will accumulate on the forest floor possibly disrupting established forage and travel patterns of wilflife species in the short term. However, the increase in available light to the understory will increase the forage opportunities within the stands. Although this type of forest is not considered to be critical habitat for any species of wildlife, it is used by many for food and cover.

Species that are closely associated with small tree, single story, closed canopy habitats will be effected. However, after the proposed treatments are completed the stands can still be typed as small tree, single story, closed canopy habitats which may still be suitable habitat for those species. In addition, this habitat type comprises about 17 % of the Analysis Area (Section G, table W-1) and is readily available across the landscape on both public and private lands. None of the wildlife species are exclusively associated with this stand type and it is not a critical or limiting habitat for any species. It is increasingly more common across the landscape as private timber companies continue to harvest at earlier ages.

***T&E species –***

Northern Spotted Owl - No suitable habitat would be removed under the action alternative and 211 acres of dispersal habitat would be treated. According to the consultation (BO # 1-15-00-F-629), approximately 61% of the federal/Coquille forest lands and 49% of all ownerships in the East Fork Coquille 5$^{th}$ field watershed contain dispersal habitat. Thomas et al. (1990) suggested at least 50% of federal lands should contain dispersal habitat in order to allow movements of owls between large reserves. Forsman *et al*. (in press) summarized results of radio telemetry and band recovery

data for dispersing juvenile spotted owls in Oregon and Washington (including the Roseburg District of the Bureau of Land Management). The data suggest that spotted owls are able to move between local LSRs and that the LSRs are well connected via dispersal habitat. There were several instances of spotted owls banded in one LSR dispersing to another LSR. Spotted owls appear to be able to move across areas of non-habitat, and even stands less than 40 years of age do not appear to inhibit dispersal. Furthermore, independent tests of spotted owl genetics suggest that spotted owl populations are well mixed.

Commercial thinning/DMT would only modify, not remove, dispersal habitat. The treatments are expected to improve habitat for spotted owls in the long run (> 20 years), because the trees would be larger and there would be greater structural diversity and complexity.

Marbled Murrelet - No suitable habitat would be removed with this alternative. Suitable habitat near many of the units has been surveyed to protocol to ascertain the need for seasonal restrictions to avoid disturbance to nesting activities. Seasonal restrictions would be used for harvest activities within 0.25 mile of unsurveyed suitable habitat or known occupied sites to avoid disturbance to nesting murrelets. Unit 29 is adjacent to an occupied site. This unit is 36 years old and tree heights are less than ½ site potential tree height. Since murrelets primarily nest in the upper half of nest trees (Hamer and Nelson 1995), the Coos Bay District level 1 consultation team considers only adjacent younger trees greater than ½ site potential tree height as offering protection and value to the occupied habitat. Therefore, the thinning unit is not expected to cause any adverse edge effects to adjacent murrelet habitat. Commercial thinning and density management may accelerate development of habitat in the future because the trees would be larger and would provide greater structural diversity.

Bald Eagle – The proposed action would have “no effect” on bald eagles because there are no known active eagle sites or roosts within the Analysis Area or within 800 meters of any proposed units. No known bald eagle nest trees, perch trees, or roost trees would be cut in any of the proposed actions. No suitable habitat for bald eagles would be removed in this action.

*S&M species* – There are no known sites for the Oregon red tree vole or Oregon megomphix within any of the proposed EA units.

*Open roads/closed roads* – The proposed action would create approximately .55 miles of new roads and renovate or improve 1.36 miles of existing open roads (table 2.2). These new road corridors and re-opening of existing road corridors will have an effect on some wildlife species that are sensitive or vulnerable to roads, barriers and openings. Vehicle traffic on these roads will increase during the periods of operation, which may increase harassment, and influence travel patterns of mobile species. Decommisioning of all of these roads used in the proposed action will insure that the harassment by vehicle will be short term and very isolated. The lack of traffic on these roads will allow the rapid

recovery of vegetation on the road surface and as cover over the road thereby lessening the overall effect that the roads may have. Open road densities for the drainages impacted by road construction and renovation decreases under this alternative (Appendix 3).

Cumulative effects

As stated earlier the stand types in which the proposed harvest units are comprised are very common throughout the Analysis Area on both federal and private lands. It is also highly likely that this stand condition will become more common as harvest continues and rotation ages become younger. The treatments outlined in the proposed action will eventually result in forest stands that continually provide habitat characteristics and structure such as large tree canopies, snags, and downlogs as they mature. These stands will continue to be used as dispersal habitat for the northern spotted owl. It is anticipated that the upland portion of these stands will be candidates for regeneration harvests when they meet the requirements such as age outlined in the RMP. However, the stands that make up the Riparian Reserves will remain to provide important habitats, and habitat connections that when combined with other reserves creates a network of late succesional type forests important for may species of wildlife including the northern spotted owl, marbeled murrellet, bald eagles, and red tree vole.

## 4.6. Effects on Aquatic Resources

### 4.6.1. Alternative 1 – No Action

Direct/Indirect effects

There are no direct effects anticipated to fish or aquatic habitat as a result of no action.

Under this alternative the current biological conditions and processes that are influenced primarily by the contributions of woody material to the aquatic environment would continue. The stands and consequently the material available for recruitment into the streams would continue to develop slowly due to intense competition. The available woody debris recruited from the stand will most likely be the suppressed and intermediate trees representing the smaller size classes which tend to decompose relatively quickly. Without recruitment of large woody debris aquatic habitat conditions remain relatively simple until trees in riparian stands grow to larger sizes, and start to enter the stream channel. Road densities and the risk of road related impacts to sensitive fish stocks and their habitat would remain the same.

Cumulative effects

Cumulative effects of past forest management in the basin have contributed to the "at risk" status of fish stocks and habitat depletion in the East Fork Coquille Watershed. Aquatic habitat quality on federal lands within the Analysis Area would likely improve slowly over time through natural processes and more rapidly through various habitat restoration projects. Other reasonably foreseeable actions that may affect aquatic resources within the Analysis Area include continued management of federal and private forest lands. Given the present standards for riparian management under the Oregon Forest Practice Rules, appreciable large wood recruitment from private and industrial forests is unlikely in the foreseeable future. The No-Action Alternative would not add to cumulative effects that led

to “at risk” fish stocks, or simplified aquatic habitat in the East Fork Coquille watershed, nor would it enhance the recovery of these conditions. .

### 4.6.2. Alternative 2 – Proposed Action

Direct/Indirect effects

There are no direct effects anticipated to fish or aquatic habitat as a result of this alternative.

Commercial thinning/density management within the Riparian Reserves will primarily remove most of the suppressed and intermediate size classes, which also are the most likely candidates to provide short-term woody debris. This reduction in available material is short-term and at such a small scale that it will only have a negligible effect on aquatic habitat quality. In addition, all streams within or adjacent to proposed harvest units have variable width no-treatment zones. These areas would serve to maintain stream bank stability, shade, and provide a concentrated, short-term source of smaller woody material available to enter stream channels.

The primary risk of an impact occurring from the actions associated with this thinning timber sale would come from sediment delivery associated with the haul of timber down gravel roads during the wet season, or from the removal of roads (decommissioning) following harvest activities. Any sediment runoff from renovation or decommissioning is expected to be localized (not expected to enter stream channels) and short-term (1-2 years). Short-term sedimentation would be minimized by implementation of Best Management Practices and design features such as water barring, seeding and mulching, and seasonal restrictions.

*T&E species* – Units and associated haul routes that lack any mechanism for an aquatic impact include unit 4, 6, 7, 8, 17, 23, and 29. The remaining units, units 3, 5, and 9, would have the potential to have a small impact on coho salmon or their critical habitat. This risk is a result of the units close proximity to coho habitat, or a haul route (or associated road work) from that unit that crosses one or more defined stream channels, with hauling scheduled to take place during the wetter months (providing a potential mechanism for an impact to occur). The proposed action may result in pulse fine sediment delivery (primarily associated with limited winter hauling in certain locations, but the potential to adversely impact sensitive fish stocks is negligible for this alternative. This low risk assessment is based on the project design features, the remoteness of many of the individual units from coho habitat (averaging over 2,500 feet away), the dispersed nature of the units, and the relatively light-touch nature of commercial thinning activities.

In the long term (15+ yrs), growth rate of individual trees and the resultant structural diversity of riparian areas are expected to increase in the thinned Riparian Reserves. This would benefit aquatic habitat and channel stability, because larger pieces of woody structure would be available for recruitment in a shorter period of time than would occur without thinning.

Cumulative effects

Because no detrimental impacts to fish populations or essential fish habitat are expected as a result of the proposed action, no negative short-term cumulative effects are anticipated. However, the cumulative effects to fish populations, in-stream habitat, and riparian dependent species that would eventually occur as a result of thinning and density management treatments would be beneficial. In addition, the potential for long-term sedimentation from eroding road surfaces would be reduced through road decommissioning and closures.

## 4.7. Effects on the Road Network

### 4.7.1. Alternative 1 – No Action

Direct/Indirect effects
There are no direct or indirect effects to open road density under the No-Action Alternative. Implementation of the road decommissioning/closure recommendations (specific to the Analysis Area) in the East Fork Coquille Watershed Analysis (Appendix J) would be deferred. Future road decommissioning and closures within the Analysis Area would be dependent on availability of funding from other sources. Roads that are currently becoming impassable to vehicle traffic due to vegetation would continue to close if left undisturbed.

Cumulative effects
Road density on private lands may increase as new roads are constructed or old roads are reopened to harvest private lands. Requests from private timber companies to construct roads on BLM lands under reciprocal right of way agreements would continue to be processed leading to a possible increase in open road density.

### 4.7.2. Alternative 2 – Proposed Action

Direct/Indirect effects
*Existing roads* – The Analysis Area currently has over 98 miles of existing open roads (Table 3.2). The proposed action includes renovating approximately 1.36 miles (< 2%) of existing roads that have not been recently maintained and are either completely impassable or marginally passable due to vegetation or other physical barriers. Renovation will include removing the impeding vegetation, cleaning the ditches, and grading the surface. During the periods of operation these roads will become open and accessible to the public. Proposed harvest units that are accessed from maintained all season roads may be harvested during the wet season. Some renovation of these mainline roads may be necessary to reduce the potential for the road system to deliver sediment to the drainage network. These renovation practices include adding rock surfacing, correcting erosion problems from ditch lines and cross drains, restoring out slope or crown sections, and stabilizing cutbanks and fills.

One stream crossing culvert on the 28-11-9.3 road has been identified as not functioning properly. The stream channel above the road has been effectively blocked by a debris torrent approximately 20-30 years ago based on the vegetation but has remained stable since then. Some down cutting of the fill slope has been occurring by water flowing over the road surface during periods of high flow. The proposed action will create a shallow depression in this portion of the road and protect it with 6" or larger crushed rock. This will serve to keep high flows contained to the immediate channel area, limit the down cutting of the fill slope, and allow for log truck traffic to pass this point.

*Decommissioned roads* – All new construction and approximately 1.82 miles of existing roads will be decommissioned according to the road closure recommendations in Appendix 3. The roads identified in this action to be decommissioned will be closed on a long-term basis but may be used again in the future. Decommissioning consists of blocking the road to vehicular traffic and leaving the road in a condition to self maintain. This includes water bars, seeding, and stream culvert removal if necessary. In addition to blocking, decommissioning of the 28-11-9.3 road will include the construction of an armored water dip. The IDT felt that the culvert and the upstream debris deposit are currently stable and pose less of a threat to sediment delivery and failure if left in place. The water dip will allow water to pass over the road without down cutting on the fill side. Existing roads that are identified in the East Fork Coquille Watershed Analysis for decommissioning or other roads in the Analysis Area that are determined to be no longer needed continue to be decommissioned through alternative funding sources such as Jobs-in-the-Woods.

*New roads* **–** The proposed action will create approximately .55 miles of new natural surface roads. These roads are strictly intended for use as logging roads to harvest the proposed units and once they are no longer needed for that purpose they will be decommissioned. None of the proposed new road construction is within Riparian Reserves. New road construction on BLM lands within the Analysis Area is generally limited to roads analyzed through the NEPA process to facilitate BLM timber sales and by private timber companies constructing new roads across BLM lands under existing reciprocal right of way agreements. All new roads are constructed according to the RMP and Best Management Practices (BMP) in the RMP. Newer BLM-controlled roads currently pose a low to moderate risk of short-term sediment delivery to streams.

Cumulative effects

Proper maintenance, renovation, construction, and decommissioning of the road system analyzed in the proposed action will reduce or eliminate the sediment delivery potential generally associated with roads. The design features outlined in Appendix 1 of this EA and the Best Management Practices listed in Appendix D of the RMP-ROD ensure that the road related activities in the proposed action coincide with the ACS objectives. Open Road Density within the Analysis Area will decrease from 4.60-mi/sq. mi. to 4.55-mi./sq. mi. by decommissioning approximately 1.32 miles of roads that are included in the Coos Bay Districts road database. The reduction in roads open to travel and the continued maintenance of existing roads will allow the stream networks to restore their developmental processes without undue influence from road related sediment.

## 4.8. Effects on Other Resources

### 4.8.1. Analysis of the No Action and Proposed Action alternatives has shown no impacts to the following elements of the human environment:

1. Air Quality
2. Areas of critical environmental concern
3. Farm lands, prime or unique
4. Flood plains
5. Water quality
6. Wild and scenic rivers
7. Wilderness values

### 4.8.2. Cultural resource values

The Lower East Fork Coquille Analysis Area has been the location of both prehistoric and historic cultural activities. A review of project documentation and records shows no known cultural resources in the immediate vicinity of these proposed harvest units. However, it is known that an historic travel route (the Brewster Trail) passed somewhere in the vicinity. Field reconnaissance did not reveal the presence of any cultural resources. EA unit 29 however does have two live hardwood trees that have girdle marks around the bole. It is uncertain why they are there but it is possible that they may mark a portion of a trail. Although the trees do not appear old enough to mark the original Brewster Trail (1865), perhaps they are markers of a more recent forest trail system. The individual trees and the area surrounding the trees will be protected from disturbance. This project is not expected to effect prehistoric or historic cultural resources. However, if any additional potential cultural resources are encountered during project-related work, all work in the vicinity should stop and the District Archeologist must be notified at once.

### 4.8.3. Native American religious concerns and/or Indian trust resources

The Lower East Fork Coquille Analysis Area is within the boundaries of traditional territory described for the Coquille Indian Tribe. Although the Coquille Indian Tribe signed two treaties with the United States (in 1851 and 1855), neither was ratified by the Congress, and so is not in force. In 1996, Congress created the “Coquille Forest”, composed of fifty-four hundred acres of formerly BLM-managed land within the Coos Bay District. None of this acreage is within the analysis area. Nevertheless, the District has been involved with the Coquille Indian Tribe in the coordination of planned activities. None of the proposed alternatives are expected to affect Tribal uses.

### 4.8.4. Solid/hazardous waste

No hazardous materials have been found to date in the action alternative units. Section O of the Analysis File contains the HazMat review. All Action Alternatives are subject to Federal and State regulatory guidelines for petroleum product use and storage. Spill Prevention, Control and Countermeasure Plans (SPCC) are required under the Oregon Forest Practices Act (Rule OAR 629-57-3600) and by Department of Environmental Quality (Rule OAR 340-108, inclusive). Spill containment capabilities on equipment sites

are recommended. Spills shall be reported and actions taken under guidelines set forth in the District Spill Plan.

### 4.8.5. Threatened, Endangered, and other Special Status Species, including Survey and Manage Species (plants, animals, and fish).

*T&E*- Four species that are considered threatened and/or endangered can be found within the Analysis Area. They are: Northern Spotted Owl, Marbled Murrelet, Bald Eagle, and coho salmon. There are no known active sites or nests within any of the proposed units for any of the T&E species. Although some spotted owl dispersal habitat will be modified by the treatments recommended in the proposed action, no suitable habitat will be removed for any of the listed T&E species. Impacts to these species and their critical habitat have been addressed in consultation with the U.S. Fish and Wildlife Service and the national Marine Fisheries Service. All mandatory terms and conditions from the Biological Opinions have been or will be incorporated/implemented in accordance with the Endangered Species Act. Detailed information on T&E species is contained in Sections G&H of the Analysis File.

*S&M/Special Status* – Species of bryophytes, lichens, and vascular plants are the only S&M or special status species found within the Analysis Area that require pre disturbance surveys. The survey results for these species are in Section P of the Analysis File. Protection of these species as well as other non-vascular botanical species incidentally encountered while surveying will follow the management recommendations in the Applications of Known Site Management Recommendations for Survey and Manage Nonvascular Species on the Coos Bay District. If discovered, vascular plants on the Bureau Sensitive or Bureau Assessment (Special Status) lists will be managed on a case-by-case basis using existing conservation strategies.

### 4.8.6. Wetlands and riparian zones

No wetland areas will be impacted by the action alternatives. Riparian Reserves will be treated as described under section “2.2 Proposed Action” and addressed in Section L of the Analysis File. The proposed treatments are designed to enhance the long-term function of the Riparian Reserve network in the East Fork Coquille Watershed by providing important components characteristic of late successional forest areas. Sections G and H of the Analysis File contains additional information on Riparian Reserves such as treatment prescriptions and snag and down log recommendations.

### 4.8.7. Noxious weed spread

Noxious weeds, such as Scotch broom, French broom, gorse, and tansy ragwort are currently scattered throughout the analysis area and occur primarily along roads and in disturbed areas. Any disturbance is likely to increase the chances of noxious weed infestation. The design features outlined in Appendix 1 for the action alternative (i.e., washing of vehicles prior to entry and mulching/seeding) would help reduce the risk of noxious weed spread. Other district projects specifically address prevention of spread of noxious weeds. Section S of the Analysis File contains the Best Management Practices,

which will be incorporated into ground disturbing activities and designs (Partners Against Weeds – An Action Plan for the Bureau of Land Management – January 1996).

#### 4.8.8. Port Orford cedar management

There is no known live Port Orford Cedar within any of the sale units or along roads used for hauling that would be impacted by implementing the proposed action or any other reasonably foreseeable timber management activity under the Coos Bay District Resource Management Plan.

#### 4.8.9. Environmental justice

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

#### 4.8.10. Aquatic Conservation Strategy Objectives

Section I of the Analysis File contains an analysis of the consistency of the actions analyzed in the EA with the Aquatic Conservation Strategy Objectives (ACS). It details each of the nine ACS objectives and describes why the proposed action is consistent with and will not prevent the attainment of the ACS objectives.

#### 4.8.11. Energy production, transmission, or conservation.

The proposed action will not have any direct or indirect adverse energy impacts (Section N, Analysis File).

#### 4.8.12. Unresolved conflicts concerning alternative uses of available resources.

Some irreversible and irretrievable commitment of resources would result from the proposed actions. Crushed rock from quarries would be committed to reconstruction and construction of the road system. Energy used to grow, manage, and harvest trees, and in other management activities is generally irretrievable. Irreversible and irretrievable commitments as stated above are discussed in the Coos Bay District RMP.

# 5.0 List of Preparers

The following in a list of the Lower East Fork Coquille EA Interdisciplinary Team members:

Core ID Team Members

| | |
|---|---|
| Paul Leman | Forester/Team Lead |
| John Guetterman | Wildlife Biologist |
| Scott Lightcap | Fisheries Biologist |

Other Contributors

| | |
|---|---|
| Matt Azhocar | Hydrologist |
| Tim Barnes | Geologist |
| Jay Flora | GIS Specialist |
| Barry Hogge | Fuels Management Specialist |
| Jim Kowalick | Timber Stand Improvement Specialist |
| Reg Pullen | Recreation Planner |
| Bob Raper | Noxious Weeds Specialist |
| Tim Rodenkirk | Botany Specialist |
| Stephan Samuals | Archeologist |
| Chris Schumacher | Silviculture Forester (Prescription Input) |
| Chris Sheridan | Silviculture Forester (Prescription Input) |
| Ron Shipp | Engineering |
| Kevin McCabe | Soils Specialist |
| Tim Votaw | Hazardous Materials Specialist |

List of Acronyms

| | |
|---|---|
| ACS | Aquatic Conservation Strategy |
| ASQ | Allowable Sale Quantity |
| BLM | Bureau of Land Management |
| BMP | Best Management Practices |
| BO | Biological Opinion |
| CT | Commercial Thinning |
| DMT | Density Management Thinning |
| EA | Environmental Assessment |
| (F)EIS | Final – Environmental Impact Statement |
| ESA | Endangered Species Act |
| ESU | Evolutionarily Significant Unit |
| FONSI | Finding of No Significant Impact |
| IDT | Interdisciplinary Team |
| LSR | Late Successional Reserves |
| MMBF | Million Board Feet |
| NEPA | National Environmental Policy Act |
| NMFS | National Marine Fisheries Service |
| ODEQ | Oregon Department of Environmental Quality |
| RMP | Resource Management Plan |
| ROD | Record of Decision |
| RR | Riparian Reserve |
| S&G | Standard and Guides |
| S&M | Survey and Manage |
| SPS | Stand Projection System |
| T&E | Threatened and Endangered |
| TMO | Transportation Management Objectives |
| USDA | United States Department of Agriculture |
| USDI | United States Department of the Interior |

**Bibliography**

Beschta R.L., R. Bilby, G. Brown, L.B. Holtby and T.D. Hofstra. 1987 ' Stream temperature and auatic habitat: fisheries and forestry interactions.' In E.O. Salo and T.W. Cindy (eds). *Streamside management, forestry and fishery interactions.* Seattle WA,: Institute of Forest Resources, University of Washington. Contribution No. 75:191-232.....11

Beschta, R. L. 1995. Cumulative Effects of Forest Practices in Oregon: Literature and Synthesis. Salem OR: Oregon Department of Forestry. Chapter 7.....10, 20

Forsman, E.D., J.A. Reid, B. Biswell, P.J. Loschl, S.G. Sovern, M. Taylor, R.G. Anthony, A. Ellingson, E.C. Meslow, G.S. Miller, K. Swindle, J. Thrailkill, F. Wagner, and D.E. Seaman. *In Press*. 'Natal and post-natal dispersal of northern spotted owls.' February 18 DRAFT version.....21

Hamer, T.E. and S.K. Nelson. 1995. Characteristics of marbled murrelet nest trees and nesting stands. Pages 69-82 *in* Ralph, C.J., G.L. Hunt Jr., M.G. Raphael, and J.F. Piatt, Technical Editors. 'Ecology and conservation of the marbled murrelet.' *Gen. Tech. Rep.* PSW-GTR-152. Albany, California. Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture. 420 pp.....22

Harr, R. D. and T.W. Cundy. 1992. 'The November 1990 floods in Western Washington,' U.S.A, VHB International Symposium. Bern, Switzerland.....10

Hayes, J.P., S. S. Chan, W. H. Emmingham, J. C. Tappeiner, L. D. Kellogg, and J. D. Bailey. 1997. 'Wildlife Response to Thinning Young Forests in the Pacific Northwest.' *Journal of Forestry*, 91(8):28-33.....8

Interagency, 1994. Final Supplemental Environmental Impact Statement on *Management of Habitat for the Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl* and its Record of Decision.....2, 8

Interagency, 2001. Record of Decision and Standards and Guidelines for *Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standard and Guidelines*.....2, 11

Keppeler, E. T.; Ziemer, R. R. 1990. 'Logging effects on streamflow: water yeild and summer low flows at Caspar Creek in Northwestern California.' *Water Resources Research* 26:1669-1679.....19

Lewis, J.; Keppeler, E. T.; Mori, S. R.; Ziemer, R R. 1998. 'Cumulative impacts of clearcut logging on storm peak flows, flow volumes and suspended sediment loads.' Unpublished draft supplied by author to the *Proceedings of the Conference o Coastal Watersheds: The Caspar Creek Story.*.....19

Marganne, Mary Allen, 1997. 'Soil Compaction and Disturbance Following a Thinning of Second-Growth Douglas-fir with a Cut-to-Length and a Skyline System in the Oregon Cascades.' A Professional Paper submitted to the Department of Forest Engineering Oregon State University. September 15, 1997.....18

Maxwell, W.G. and F.R. Ward. 1980. Photo series for quantifying natural forest residues in common vegetation types of the Pacific Northwest. U.S.D.A. Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, OR. *General Technical Report PNW-105*. 230 pp.....9, 16

NMFS, 1997. National Marine Fisheries Service's March 18, 1997 Biological Opinion and Conference Opinion on activities covered in the Coos Bay District's FRMP.....2, 7

O'Neil, Thomas A., David H. Johnson, Charley Barrett, Marla Trevithick, Kelly A. Bettinger, Chris Kiilsgaard, Madeleine Vander Heyden, Eva L. Greda, Derek Stinson, Bruce G. Marcot, Patrick J. Doran, Susan Tank, and Laurie Wunder. 2001. 'Matrixes for Wildlife-Habitat Relationship in Oregon and Washington,' Northwest Habitat Institute. 2001. In D. H. Johnson and T. A. O'Neil (Manag. Dirs.) *Wildlife-Habitat Relationships in Oregon and Washington*. Oregon State University Press, Corvallis, Oregon.....11

Oregon, 1994. Oregon Forest Practice Rules and Statutes, (OAR 629-635-200).....12

Rosgen, 1996. 'A classification of natural rivers.' *Catena 22*: pages 169-199 .....19

Rothacher, Jack. 1971. 'Regimes of streamflow and their modification by logging.' In: *Proceedings of the symposium on forest land use and stream environment*; Corvallis, OR. Oregon State University, 55-63. .....19

Smith, David M. 1986. *The Practice of Silviculture* Eigth Edition, New York. Wiley & Sons. .....8, 16

Spies, T.A., J.F. Franklin, and T.B. Thomas. 1988. 'Coarse woody debris in Douglas-fir forests of western Oregon and Washington.' *Ecology* 69(6):1689-1702.....9

Stednick, J., and T. J. Kern. 1992. 'Long term effects of timber harvesting in the Oregon Coast Range: The New Alsea Watershed Study' (NAWS), p. 502-509. In: *Interdisciplinary Approaches in Hydrology and Hydrogeology*. Portland, OR. October 1992.....10

Tappeiner J.C., Huffman D., Marshall D., Spies T.A., Baily. J.D. 1997 'Density, ages, and growth rates in old-growth and young-growth forests in coastal Oregon.' *Can. J. For. Res.* (27) 638-648 .....8

Thomas, J.W., E.D. Forsman, J.B. Lint, E.C. Meslow, B.R. Noon, and J. Verner. 1990. A conservation strategy for the northern spotted owl. A Report by the Interagency Scientific Committee to address the conservation of the northern spotted owl. U.S. Department of Agriculture, Forest Service, and U.S. Department of the Interior, Fish and Wildlife Service, Bureau of Land Management, and National Park Service. Portland, Oregon. 427 pp.....21

USDI-BLM, 1989. *The Western Oregon Program - Management of Competing Vegetation* .....2

USDI-BLM, 1995. Coos Bay District *Resource Management Plan and Environmental Impact Statement* and its *Record of Decision*, (RMP-ROD).....1, 2, 27

USDI-BLM, 2000. *East Fork Coquille Watershed Analysis* .....2, 10, 11, 12, 14, 27

USDI-BLM, 2001, Implementation of 2001 S&M Annual Species Review-BLM Instruction Memorandum OR-2002-064.....11, 12

Wilson J.S. & Oliver C.D. 2000 'Stability and density management in Douglas-fir plantations.' *Can. J. For. Res* (30 910-920 .....1, 16

Ziemer, R. L. 1981. 'Strom flow response to road building and partial cutting in small streams of northern California.' *Water Resources Research* 17: 907-917.....19

Ziemer, R. L. 1998. 'Flooding and stormflows.' *USDA Forest Service Gen. Tech. Rep. PSW-GTR-168*-Web .....19

# Appendix 1

## Design Features including Harvest and Reserve Tree Marking Guidelines

### Design Features for Action Alternatives

Design features include timber sale design, contract stipulations, and prescribed activities to be accomplished by the BLM or timber sale purchaser. The objective of these design features is to maintain or enhance the quality, quantity, and productivity of the resources in the project area.

- In ground based harvest areas, a cut-to-length harvester would be required to fall trees.
- In cable harvest units either a cut-to-length harvester or conventional falling method using chainsaws would be employed. Trees in skyline cable yarding corridors would need to be cut to facilitate operating a cable yarding system.
- Conventional falling with chainsaws would be permitted only from July 1 to March 1 to reduce bark damage during high sap flow.
- Falling with a cut-to-length harvester typically would be permitted only during late spring through early fall when soil moisture is below the 25% plastic limit.
- Trees that must be felled within the no-harvest buffer to provide yarding corridors would be felled toward the stream channel and retained on site to provide short term coarse woody debris.
- Trees in thinning units would be required to be limbed, topped, and cut into log lengths not exceeding 40 feet prior to yarding.
- Directionally fall trees away from all unit boundaries. Where density management thinning occurs within Riparian Reserves, directionally fall trees away from all stream channels.

- Require a minimum of one-end suspension in all harvest units. If yarding through Riparian Reserve corridors require full suspension over stream channels.
- In units (or portions) requiring ground-based equipment, falling and yarding will be limited to June 1$^{st}$ through October 15$^{th}$, depending on seasonal rainfall when the following conditions are met: 1) when the soil moisture content measures 25 % or less, and 2) when road conditions are dry for hauling.
- Ground-based yarding equipment will consist of a rubber tired or tracked forwarder. The yarding vehicle would forward the logs completely free and clear of the ground while traveling on a layer of slash created during the harvesting
- Designated forwarder trails in the ground-based units will utilize preexisting skid roads to the fullest extent possible. Where the forwarder cannot use preexisting skid roads travel on undisturbed ground will be minimized. This is particularly important in unit 5.
- Where forwarder trails access open roads, trails would be blocked with logging

debris to prevent vehicle access after harvest is completed.

- Ground based equipment would not be permitted to travel through stream channels.
- To minimize damage to residual trees due to bark slippage, cable yarding would be restricted between March 1 and June 30 on skyline units.
- No-treatment buffers would be applied to streams within or adjacent to thinning units as needed to maintain bank/slope stability and shade. The widths of the no-treatment buffers are identified in Section L of the Analysis File.
- Tree marking guidelines are outlined in Appendix 1.
- Leave all existing snags except where doing so would create a safety hazard.
- Leave all existing down logs.
- All or portions of EA Units 3, 5, and 29 are within 0.25 miles of known marbled murrelet occupied sites: therefore, harvest activities such as felling, cable yarding, etc would not occur between April 1 and August 5 in those portions. From August 6 through September 15, there would be daily timing restrictions confining activities between two hours after sunrise until two hours before sunset.
- Road activities (landing construction, renovation, improvement, and decommissioning) will not occur 1 April - 5 August within 1/4 mile of marbled murrelet occupied sites (EA Units 3, 5,) except for those associated with the mainline haul route maintenance. From August 6 through September 15, there would be daily timing restrictions confining activities from between two hours after sunrise until two hours before sunset.
- As identified in Section G, Table W-7 of the Analysis File, top green trees to create immediate snag habitat. In DMT areas, some trees could be topped high enough that the trees remain alive. In all harvest units, tree-topping requirements should be adjusted only if excessive numbers of snags are created inadvertently during yarding operations or by wind (see Table W-5 for further details).
- Specific treatments for road closures are identified in Appendix 3.
- Minimize the road clearing width for all road construction and renovation.
- All roads designated for winter use must be surfaced with an approved lift of rock. Renovation/maintenance and landing construction activities would occur during summer or fall (prior to winter storm activity). Roads would be closed according to the Transportation Management Objectives (TMO) plan. Roads designated for summer use only would be mulched, grass seeded (in accordance with District Native Plant Restoration Policy), water barred (where appropriate) and blocked prior to winter storm activity. Prior to first rains after completion of timber sale activity, roads designated to be decommissioned would be blocked, have stream-crossing culverts removed as determined, and have water bars or dips installed as needed to restore pre-road hydrologic function.

- If winter haul on gravel roads is planned, then the following additional Best Management Practices should be implemented to prevent sediment delivery at or near stream crossings along the haul route. The sediment prevention measures must be in place, before winter haul begins. They include:
    1. Apply an additional lift of rock to the area of road that can influence the stream if rill erosion is evident in the road tread near live stream crossings.

2. Contain any offsite movement of sediment from the road or ditch flow near streams with silt fence or sediment entrapping blankets. Such control measures must allow for the free passage of water without detention or plugging. These control structures and applications should receive frequent maintenance, and may be removed at the completion of haul.
3. If the ground is already saturated from winter rains and more than 2 inches of precipitation is predicted in the project area over the next 24 hours, then winter haul should be suspended. Operations may resume after the 24-hour suspension, except when another storm (exceeding 2 inches) is forecasted. Currently, precipitation predictions are based on the Quantitative Precipitation Forecast (QPF) maps from **The HydroMeterological Predication Center Internet site: http://www.hpc.ncep.noaa.gov/html/fcst2.html.** A similar predictive model Internet site may be used if this site should be unavailable in the future.

- Best Management Practices (BMP's) would be followed for all actions as listed in Section H pages 69 - 74, Volume 2, Coos Bay District Final Proposed Resource Management Plan, 1994.

**Monitoring**

Monitoring guidelines are established in the 1995 FRMP/ROD, pp. L-3, L-4, L8, & L9, and the 1994 Standards and Guidelines, pp. E-1 to E-10.

Road closure Monitoring
All roads closed as a result of the action alternatives would be monitored to determine whether design features were implemented, and were effective one year after implementation.

Ground-based System Monitoring
A systematic evaluation of the areas yarded with ground-based equipment within a year after completion of harvest activities. The evaluation will determine the extent of the trail network within the unit, the amount of old trails used in proportion to new trails created, and effectiveness of limiting equipment to soil moisture content.

Thinning Marking Summary for Tree Marking
Lower East Fork Coquille Stands

**GFMA Portion of Stands**

| EA UNIT | Leave all conifer trees _____ " and larger | Ave Conifer Leave BA/AC | # of Leave Trees on 20 BAF Prism | Leave Conifer Trees/acre | Conifer Cut Vol./acre | Pre-Harvest Conifer BA/AC |
|---|---|---|---|---|---|---|
| 3 | 16 | 120 | 6 | 75 | 6.0 | 150 |
| 4 | 12 | 120 | 6 | 180 | 6.0 | 160 |
| 5 | 15 | 120 | 6 | 150 | 9.0 | 175 |
| 6 | 11 | 120 | 6 | 230 | 7.0 | 180 |
| 7 | 13 | 120 | 6 | 170 | 5.5 | 160 |
| 8 | 16 | 140 | 7 | 70 | 15.5 | 210 |
| 9 | 13 | 140 | 7 | 135 | 15.0 | 220 |
| 17 | 17 | 140 | 7 | 140 | 8.5 | 180 |
| 23 | 13 | 120 | 6 | 153 | 5.5 | 150 |
| 29 | 16 | 120 | 6 | 142 | 7.0 | 140 |

**Riparian Reserve Portion of Stand**

| Leave all conifer trees _____ " and larger | Ave Conifer Leave BA/AC | # of Leave Trees on 20 BAF Prism | Leave Conifer Trees/acre |
|---|---|---|---|
| 16 | 100 | 5 | 44 |
| 12 | 90 | 4-5 | 109 |
| 15 | 90 | 4-5 | 82 |
| 11 | 100 | 5 | 228 |
| 13 | 100 | 5 | 105 |
| na | na | na | na |
| 12 | 90 | 4-5 | 111 |
| 17 | 100 | 5 | 54 |
| 13 | 90 | 4-5 | 71 |
| 16 | 100 | 5 | 75 |

**Marking Guide for Commercial Thinning of GFMA Units**

Thin from below using appropriate leave BA/AC and appropriate diameter limit.
Trees may be left individually or in groups.

Douglas-fir is considered to be the preferred leave. Leave some cedars when available.
Trees with a height/ diameter (H/d) ratio greater than 100 should not be considered for leave trees, if insufficient trees are available, the trees with the lowest H/d ratio shall be left.

Residual tree spacing shall be Varied to preserve the largest diameter and height of domianant or codominant trees of good form and vigor. Acceptable residual conifer trees are those having a live crown ratio of at least 35% and without crook, sweep, broken tops, multiple tops, scarring, disease, or leaning more than 10 degrees from vertical.

In portions of the stand where there are insufficient acceptable conifer trees to meet the residual specs cited above, trees with the least defect and largest diameter, height, and live crown ratio shall be preserved from harvest.

Hardwood trees shall not be counted as leave trees for BA/ac, leave hardwoods spaced 70' apart.
All Bigleaf Maples will be left, regardless of spacing. Maples may be counted for BA/ac.

Only Conifer trees greater than 8" DBH shall be counted to meet the residual spec's listed above.

**Marking Guide for Riparian Reserve Density Management**

Thin from below using appropriate leave BA/AC and appropriate d
Trees may be left individually or in groups. Spacing will be variabl

No preference shall be given to DF for leave, maintain the existing distribution within the riparian reserve.

All bigleaf maples will be left and all hardwoods (excluding Red alc than 12" DBH will be considered leave trees. Hardwood leave tree counted as leave trees for BA/acre.

Only Conifer trees greater than 8" DBH shall be counted to meet tl

Reserve large conifer snags if they do not constitute a safety haza
Buffer snags with leave trees around them.

# Appendix 2

## Harvest Unit Details and Maps

### Lower East Fork Coquille Analysis Area EA
### Proposed Harvest unit details

| EA Unit No. | Legal | Total Stand Acres | Treatment | GFMA Treated Acres | GFMA Rx | GFMA Vol/Ac. | GFMA Volume | Riparian Resrve Treated Acres (DM) | Riparian Resrve Rx | Riparian Resrve Vol/Ac. | Rip. Res. Volume | Harvest System | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 28-11-3 | 28 | CT/DM | 18 | 35 | 6 | 108 | 10 | 25 | 13.5 | 135 | Skyline | MMR Seasonal Restriction |
| 4 | 28-11-3 | 7 | CT /DM | 6 | 35 | 6 | 36 | 1 | 25 | 10.8 | 11 | Skyline | |
| 5 | 28-11-11 | 8 | CT/DM | 3 | 35 | 9 | 27 | 5 | 25 | 14.4 | 72 | Ground based | MMR Seasonal Restrictions |
| 6 | 28-11-9 | 24 | CT/DM | 15 | 40 | 7 | 105 | 9 | 40 | 7.2 | 65 | Skyline | |
| 7 | 28-11-9 | 13 | CT/DM | 12 | 35 | 5.5 | 66 | 1 | 25 | 10.2 | 10 | Skyline | |
| 8 | 28-11-16 | 13 | CT | 13 | 35 | 15.5 | 202 | 0 | 25 | 0 | 0 | Skyline | |
| 9 | 28-11-9 | 42 | CT/DM | 25 | 35 | 7.5 | 188 | 17 | 25 | 10 | 170 | Skyline | |
| 17 | 28-11-21 | 22 | CT/DM | 11 | 35 | 8.5 | 94 | 11 | 25 | 17.2 | 189 | Ground based | |
| 23 | 28-11-3 | 11 | CT/DM | 8 | 35 | 5.5 | 44 | 3 | 25 | 14 | 42 | Skyline | |
| 29 | 28-11-1 | 43 | CT/DM | 27 | 30 | 7 | 189 | 16 | 25 | 9 | 144 | Ground based | MMR seasonal restrictions |
| | | | | 0 | | | | | | | 0 | | |
| | | 211 | | 138 | | | 1,058 | 73 | | | 838 | | |

September 5, 2002

| | Acres | Volume | |
|---|---|---|---|
| Commercial Thinning | 138 | 1,058 | |
| Density Management | 73 | 838 | |
| HW Conversion | 0 | 0 | |
| Regeneration Harvest | 0 | 0 | |
| Total | 211 | 1,896 | |
| Matrix | 138 | ASQ | 1,058 |
| | | NonASQ | 838 |

## Lower East Fork Coquille Analysis Area EA
## Proposed Action - Road Details

| EA Unit No. | Photo # (97) | Legal | New Road Const. (ft) | Renovation (feet) | Improvement (feet) | Hauling Season (Restriction) | Comments (Rock or dirt) |
|---|---|---|---|---|---|---|---|
| 3 | 8-30-18 | 28-11-3 | 2,000 | 1200 | 0 | Summer (Dirt / MMR) | New Const. off the -3.4 rd / Dirt surface. Renovation of the 28-11-3.4 |
| 4 | 8-30-18 | 28-11-3 | 0 | 1400 | 0 | Summer (Dirt) | Renovation of the -3.5 rd. Dirt road = summer haul |
| 5 | 38-31-62 | 28-11-11 | 0 | 500 | 0 | Summer (GB /MMR) | Renovation of 28-11-11.0A1 and BPA Powerline rd. |
| 6 | 5-29-52 | 28-11-9 | 0 | 1100 | 0 | Summer (Dirt) | Reno. on the 28-11-9.3 rd. Requires one stream crossing to be repaired. |
| 7 | 5-29-52 | 28-11-9 | 0 | 0 | 0 | Winter/Summer | All harvest will be from existing gravel road. |
| 8 | 5-29-50 | 28-11-16 | 900 | 0 | 0 | Summer (Dirt NC) | Ridge top construction- follow old cat road for a portion. |
| 9 | 5-29-52 | 28-11-9 | 0 | 400 | 0 | Winter/Summer | Reno of 28-11-9.6 rd. (new Rd. #) |
| 17 | 5-29-49 | 28-11-21 | 0 | 2400 | 0 | Summer (GB) | Reno of the -20.2 B |
| 23 | 8-30-18 | 28-11-3 | 0 | 0 | 0 | Winter/Summer | 500' of reno covered under EA unit 3. |
| 29 | 17-32-155 | 28-11-1 | 0 | 0 | 0 | Summer (GB /MMR) | |
| | | | | | | | |
| | | | 2,900 | 7,000 | 0 | | |

NOTE:
Roads identified to be renovated or improved are existing roads open for use that have had some vegetation encroachment and need improvements to drainage or surfacing. The action alternatives will improve the drainage and surface and the roads will be left in a stable pre-hydrologic condition after decommissioning.

**Lower East Fork Coquille Analysis Area EA**
**Road Mileage Summary**

| Proposed New Roads | | Existing Roads | | | |
|---|---|---|---|---|---|
| **Construction Miles** | **Closure Miles** | **Renovation or Improvement** | **Miles** | **Miles of Decomm.** | **Gated Road Miles** |
| 0.55 | 0.55 | 28-11-3.4 | 0.23 | 0.23 | |
| | | 28-11-3.5 | 0.27 | 0.27 | |
| | | 28-11-9.3 | 0.21 | 0.32 | |
| | | 28-11-9.5A & B | | | 0.15 |
| | | 28-11-9.6 | 0.1 | 0.1 | |
| | | 28-11-11.0A1 | 0.1 | | 1.00 |
| | | 28-11-20.2B | 0.45 | 0.9 | |
| **0.55** | **0.55** | | **1.36** | **1.82** | **1.15** |

G:\cb\Mra\T-sales\Ea-s\Lef_coq\Appendix 2.xls[Road Summary]

# Lower East Fork Coquille Analysis Area EA

## Units dropped from an action alternative.

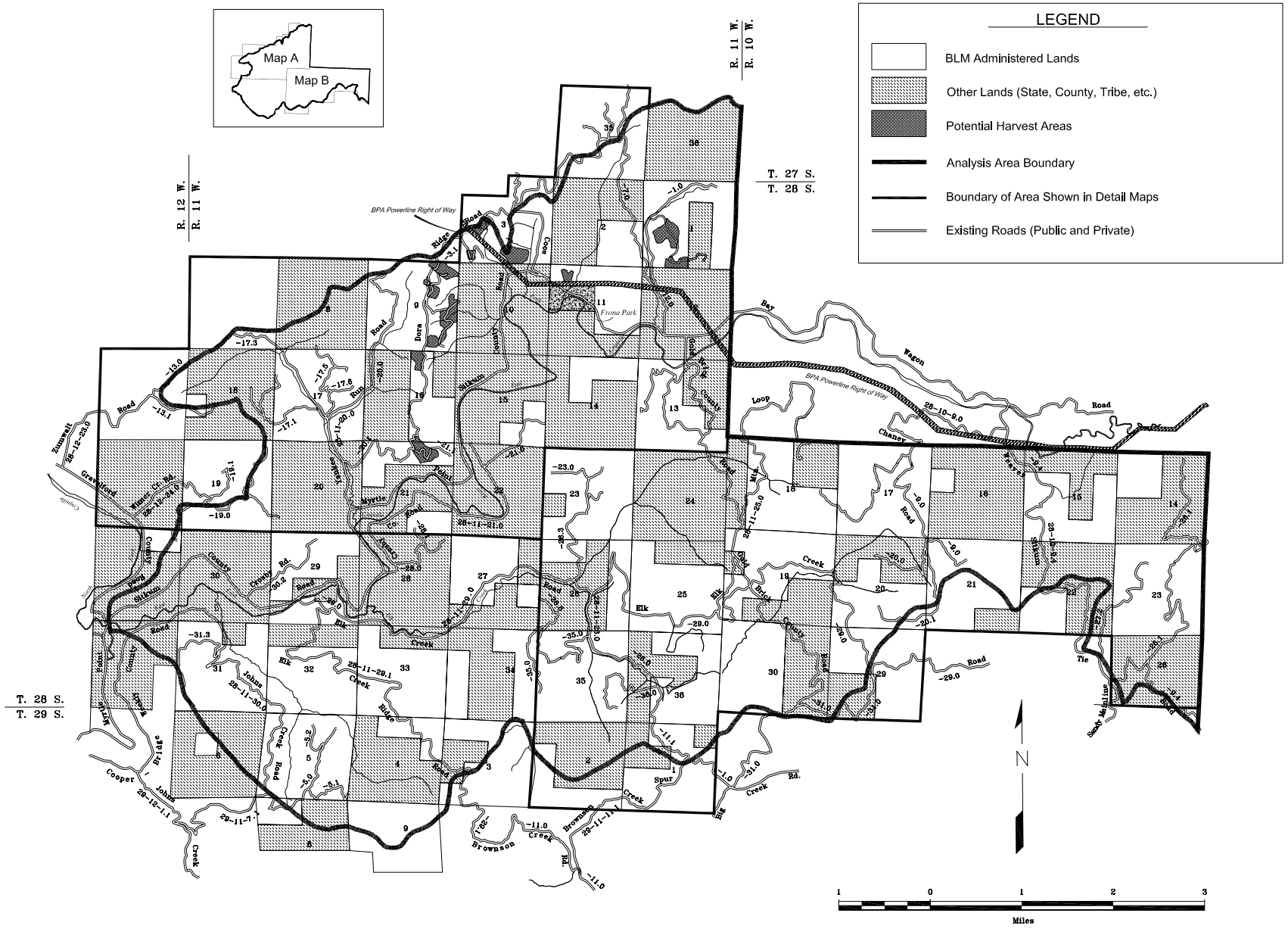
| EA Unit No. | LEF Stand Exam # | Photo # (97) | Legal | Estimated Acres | Estimated Volume/Ac. (MBF) | Estimated Total Volume (MBF) | RD Conifer | TPA Existing Conifer | BA/AC Conifer | Treatment | Harvest Method | Reason Dropped |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 25 | 38-31-65 | 27-11-35 | 51 | 6 | 306 | 44 | 250 | 140 | | | POC |
| 2 | 19 | 8-30-18 | 28-11-3 | 18 | 11 | 198 | 44 | 311 | 133 | CT | Cable | Poor stocking |
| 10 | 3 | 23-27-105 | 28-11-7 | 6 | 12 | 72 | 63 | 381 | 201 | CT | Ground based | POC |
| 11 | 7 | 23-28-4 | 28-11-17 | 16 | 9 | 144 | 47 | 185 | 168 | CT | Cable | POC |
| 12 | 9 | 23-28-4 | 28-11-17 | 14 | 15 | 210 | 70 | 369 | 225 | CT | Cable | POC |
| 13 | 8 | 23-28-4 | 28-11-17 | 20 | 14 | 280 | 70 | 447 | 213 | CT | Cable | POC |
| 14 | 6 | 23-28-4 | 28-11-17 | 9 | 14 | 126 | 52 | 184 | 192 | CT | Cable | POC |
| 15 | 1 | 23-27-102 | 28-11-19 | 10 | 12.5 | 125 | 67 | 374 | 208 | CT | Ground based | POC |
| 16 | 2 | 23-27-102 | 28-11-19 | 30 | 9 | 270 | 51 | 222 | 178 | CT | Cable | POC |
| 18 | 39 | 28-11-13 | 17-32-152 | 17 | 6 | 102 | 43 | 256 | 133 | CT | Cable | Poor stocking |
| 19 | 24 | 38-31-58 | 28-11-23 | 61 | 12.5 | 763 | 54 | 264 | 182 | CT | Ground based | POC |
| 20 | 22 | 38-31-55 | 28-11-35 | 34 | 12 | 408 | 55 | 217 | 200 | CT | Cable | POC |
| 21 | 23 | 38-31-55 | 28-11-35 | 33 | 14.5 | 479 | 64 | 281 | 221 | CT | Cable | POC |
| 22 | 31 | 21-37-230 | 28-10-23 | 33 | 6.5 | 215 | 45 | 177 | 163 | CT | Ground based | POC |
| 24 | 55 | 38-31-63 | 28-11-2 | 22 | 13 | 286 | NA | NA | NA | HC | Cable | POC |
| 25 | 43H | 28-11-11 | 38-31-62 | 5 | 5 | 25 | NA | NA | NA | HC | Ground Based | Poor stocking |
| 26 | 50 | 16-34-154 | 28-10-17 | 26 | 25.4 | 660 | NA | NA | NA | HC | Cable | POC |
| 27 | 51 | 16-34-154 | 28-10-17 | 12 | 28.2 | 338 | NA | NA | NA | HC | Ground based | POC |
| 28 | 49 | 28-10-21 | 16-35-53 | 20 | 7 | 140 | NA | NA | NA | HC | Cable | POC |
| 30 | 28/28W | 16-34-154 | 28-10-17 | 38 | 45 | 1,710 | | | | Regen.DM | Cable | POC |
| 31 | | 28-10-17 | 16-34-154 | 7 | 0 | 0 | NA | NA | | HC | Cable | Determined treatmnent not needed |
| 32 | 56E/56W | 16-34-154 | 28-10-17 | 39 | 38 | 1,482 | | | | Regen/DM | Cable | POC |

Connectivity

10/7/02

# Lower East Fork Coquille Analysis Area EA

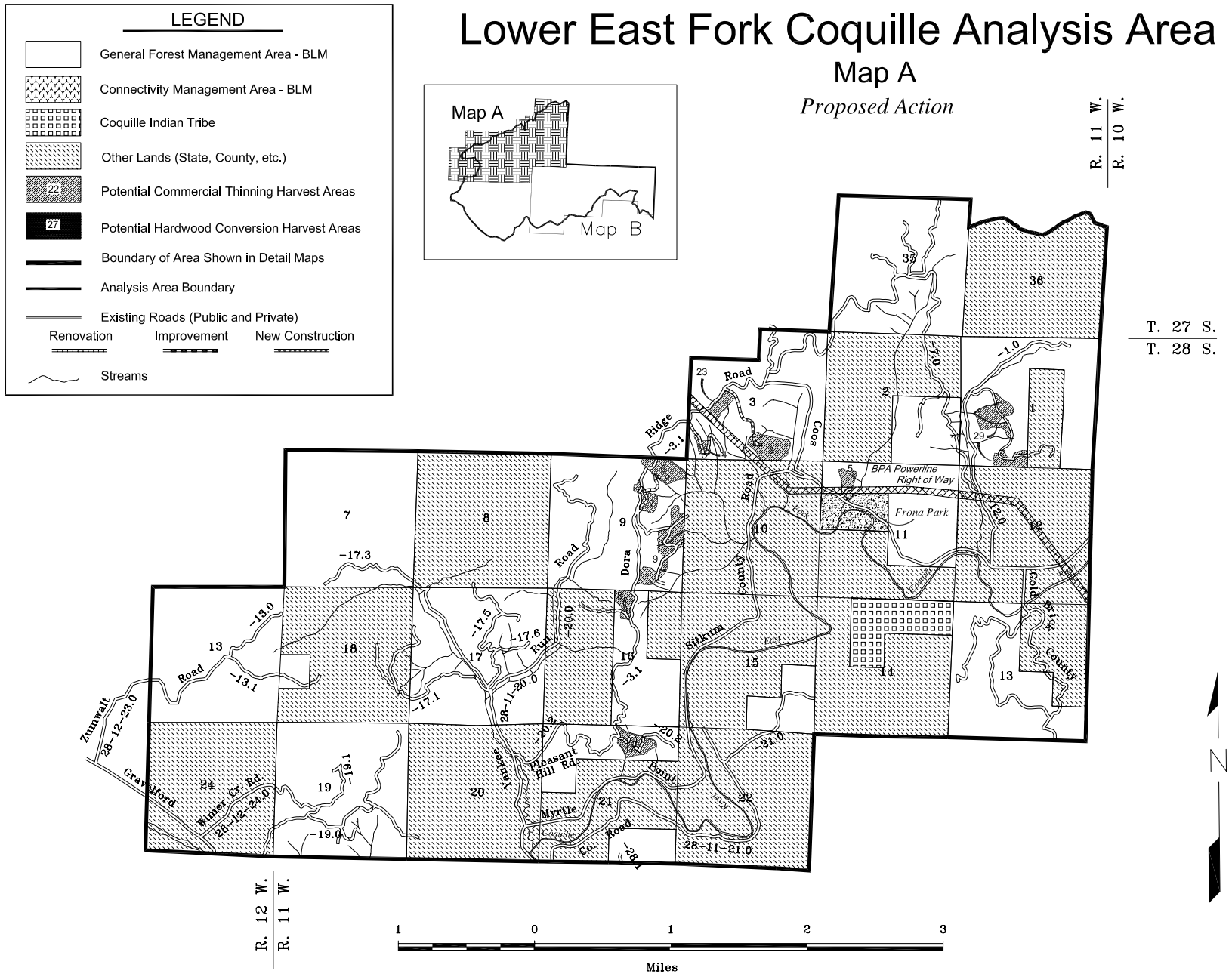
*Vicinity Map*



# Lower East Fork Coquille Analysis Area EA

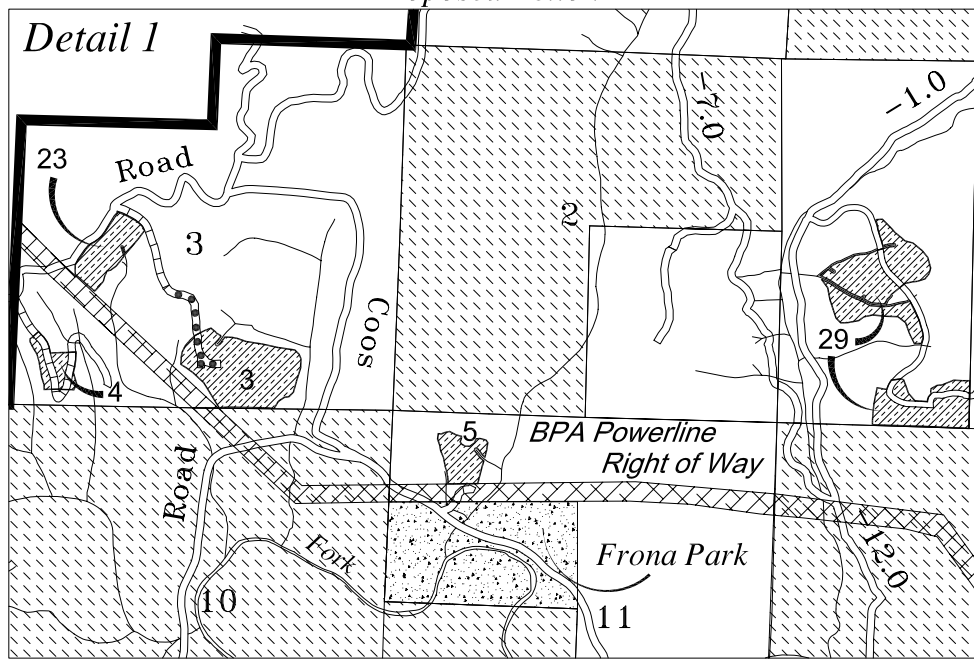
## Map A

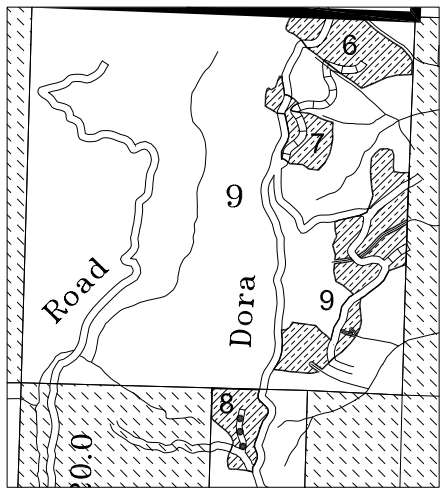
*Proposed Action*

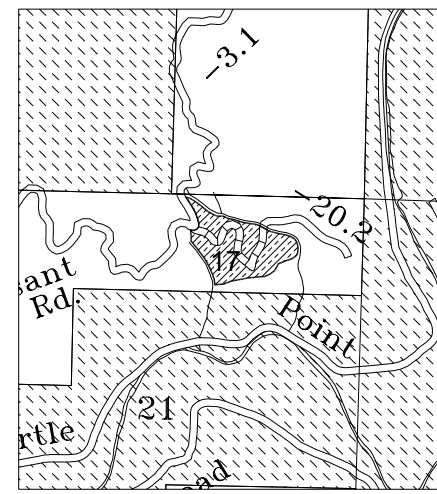


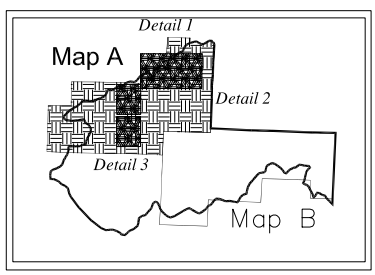
# Lower East Fork Coquillle Analysis Area
# Map A Unit Detail Map

*Proposed Action*




LEGEND

- General Forest Management Area - BLM
- Connectivity Management Area - BLM
- Coquille Indian Tribe
- Other Lands (State, County, etc.)
- 22 Potential Commercial Thinning Harvest Areas
- 27 Potential Hardwood Conversion Harvest Areas
- 32 Potential Regeneration Harvest Areas
- Boundary of Area Shown in Detail Maps
- Analysis Area Boundary
- Existing Roads (Public and Private)
  - Renovation
  - Improvement
  - New Construction
- Streams

N

2 inches = 1 mile

## Appendix 3

**Lower East Fork Coquille Analysis Area Timber EA**
**Road Closure Recommendations**
**Proposed Action**

The following propsed actions will be accomplished under timber sale activities covered by this EA.
The recommendation to close these roads incorporated information from the Transportation Management Objectives developed in the East Fork Coquille Watershed Analysis.

| Road No. | Miles Decom.** | Miles Closed** | Drainage/ Subwatershed | Stream Crossing. | Remarks | Management Objectives *** |
|---|---|---|---|---|---|---|
| 28-11-3.4* | 0.23 | | crosby rd./LEFC | n | DCOM;block @ jct w/-3.1; access to #3,23; uninventoried | 1, 4 |
| 28-11-3.5* | 0.27 | | crosby rd./LEFC | n | DCOM;block @ jct w/-3.1; access to #4; uninventoried | 1, 4 |
| 28-11-9.3 | 0.32 | | crosby rd./LEFC | y | DCOM;block @ jct w/-3.1;access to #6; Create armored water dip to stop down cutting of fill slope. Identified in WA for DCOM | 1,2,4 |
| 28-11-9.5 A & B | | 0.15 | | | DCOM. Accesses private ownership - need permission from Plum Creek. Identified in WA for DCOM | 1,4 |
| 28-11-9.6* | 0.10 | | crosby rd./LEFC | n | DCOM;block @ jct w/-9.0 ; uninventoried | 1,4 |
| 28-11-11.0A1 | | 1.00 | crosby rd./LEFC | y | Gate @ CBWR. Length includes other rds. behind gate that total 0.88 mi. Identified in WA for DCOM | 2,4 |
| 28-11-20.2B | 0.90 | | crosby rd./LEFC | y | DCOM;block @ jct w/-3.1; access to #17; Identified in WA for DCOM | 1,2,4 |
| **Total** | **1.82** | **1.15** | | | | |

DCOM = Decommission (Block and left in condition to self maintain.)
Closed = Temporarily Closed (Roads blocked with a gate)
*** 1 = Wildlife, 2 = Aquatic Conservation Strategy, 3 = Phytophthora lateralis control,
4 = Road Density
** = Miles on BLM only
* These roads were not included in the calculation of road density because they are uninventoried roads.

| | Crosby Rd | Steel Creek | Anaysis Area |
|---|---|---|---|
| Current Open Road Density: | 4.19 | 2.72 | 4.60 |
| New Open Road Density: | 3.9 | 2.72 | 4.55 |

# LEFCoq Analysis Area Open Road Density Summary

Existing Conditions 03/14/02

| Control | Surface Type | BLM Lands | | Non-BLM Lands | | Analysis Area Totals | |
|---|---|---|---|---|---|---|---|
| | | Area (ac.) = | 13650 | Area (ac.) = | 16706 | Area (ac.) = | 30356 |
| | | Area (sq.mi.) = | 21.33 | Area (sq.mi.) = | 26.10 | Area (sq.mi.) = | 47.43 |
| | | Miles | Density | Miles | Density | Miles | Density |
| BLM | BST | 13.43 | 0.63 | 10.93 | 0.42 | 24.36 | 0.51 |
| | Rock | 47.36 | 2.22 | 8.38 | 0.32 | 55.74 | 1.18 |
| | Natural | 4.23 | 0.20 | 0.28 | 0.01 | 4.51 | 0.10 |
| | Unknown | 9.34 | 0.44 | | 0.00 | 9.34 | 0.20 |
| Private | BST | | 0.00 | | 0.00 | 0.00 | 0.00 |
| | Rock | 1.72 | 0.08 | 11.29 | 0.43 | 13.01 | 0.27 |
| | Natural | 1.48 | 0.07 | 8.34 | 0.32 | 9.82 | 0.21 |
| | Unknown | | 0.00 | | 0.00 | 0.00 | 0.00 |
| Other | BST | 0.46 | 0.02 | 15.33 | 0.59 | 15.79 | 0.33 |
| | Rock | 0.60 | 0.03 | 5.47 | 0.21 | 6.07 | 0.13 |
| | Natural | | 0.00 | 0.06 | 0.00 | 0.06 | 0.00 |
| | Unknown | | 0.00 | 57.25 | 2.19 | 57.25 | 1.21 |
| **TOTALS** | | **78.62** | **3.69** | **117.33** | **4.49** | **195.95** | **4.13** |

Density = miles by surface type / area in sq. mi.

Shaded area is used to calculate Open Road Density.

| | Road Miles* | Area - BLM lands only(sq.mi.) | Road Density (milesi/sq.mi) |
|---|---|---|---|
| OPEN | 98.21 | 21.33 | 4.60 |
| CLOSED | 8.52 | 21.33 | 0.40 |
| TOTALS | 106.73 | 21.33 | 5.00 |

* Road miles are miles of roads on BLM lands and BLM controlled roads on private lands

Nov. 7, 2002

# CROSBY ROAD- OPEN ROAD DENSITY SUMMARY

Existing Conditions 03/14/02

| Control | Surface Type | BLM Lands | | Non-BLM Lands | | Watershed Totals | |
|---|---|---|---|---|---|---|---|
| | | Area (ac.) = | 2726 | Area (ac.) = | 5383 | Area (ac.) = | 8109 |
| | | Area (sq.mi.) = | 4.26 | Area (sq.mi.) = | 8.41 | Area (sq.mi.) = | 12.67 |
| | | Miles | Density | Miles | Density | Miles | Density |
| BLM | BST | 3.39 | 0.80 | 0.72 | 0.09 | 4.11 | 0.32 |
| | Rock | 8.66 | 2.03 | 0.70 | 0.08 | 9.36 | 0.74 |
| | Natural | 0.04 | 0.01 | | 0.00 | 0.04 | 0.00 |
| | Unknown | 3.47 | 0.81 | | 0.00 | 3.47 | 0.27 |
| Private | BST | | 0.00 | | 0.00 | 0.00 | 0.00 |
| | Rock | 0.77 | 0.18 | 2.40 | 0.29 | 3.17 | 0.25 |
| | Natural | | 0.00 | 0.53 | 0.06 | 0.53 | 0.04 |
| | Unknown | | 0.00 | | 0.00 | 0.00 | 0.00 |
| Other | BST | 0.08 | 0.02 | 11.71 | 1.39 | 11.79 | 0.93 |
| | Rock | | 0.00 | | 0.00 | 0.00 | 0.00 |
| | Natural | | 0.00 | | 0.00 | 0.00 | 0.00 |
| | Unknown | | 0.00 | 18.85 | 2.24 | 18.85 | 1.49 |
| **TOTALS** | | **16.41** | **3.85** | **34.91** | **4.15** | **51.32** | **4.05** |

Density = miles by surface type / area in sq. mi.

Shaded area is used to calculate Open Road Density.

| Open Road Density | BLM Lands * | |
|---|---|---|
| | miles | density |
| OPEN | 17.83 | 4.19 |
| CLOSED | 3.02 | 0.71 |
| TOTALS | 20.85 | 4.90 |

*includes BLM control on non-BLM

# STEEL CR.- OPEN ROAD DENSITY SUMMARY

Existing Conditions 03/14/02

| Control | Surface Type | BLM Lands | | Non-BLM Lands | | Watershed Totals | |
|---|---|---|---|---|---|---|---|
| | | Area (ac.) = | 1617 | Area (ac.) = | 1136 | Area (ac.) = | 2752 |
| | | Area (sq.mi.) = | 2.53 | Area (sq.mi.) = | 1.78 | Area (sq.mi.) = | 4.30 |
| | | Miles | Density | Miles | Density | Miles | Density |
| BLM | BST | | 0.00 | | 0.00 | 0.00 | 0.00 |
| | Rock | 4.13 | 1.63 | 0.66 | 0.37 | 4.79 | 1.11 |
| | Natural | 0.81 | 0.32 | | 0.00 | 0.81 | 0.19 |
| | Unknown | 0.54 | 0.21 | | 0.00 | 0.54 | 0.13 |
| Private | BST | | 0.00 | | 0.00 | 0.00 | 0.00 |
| | Rock | 0.74 | 0.29 | 1.60 | 0.90 | 2.34 | 0.54 |
| | Natural | | 0.00 | 1.21 | 0.68 | 1.21 | 0.28 |
| | Unknown | | 0.00 | | 0.00 | 0.00 | 0.00 |
| Other | BST | | 0.00 | 0.06 | 0.03 | 0.06 | 0.01 |
| | Rock | | 0.00 | | 0.00 | 0.00 | 0.00 |
| | Natural | | 0.00 | | 0.00 | 0.00 | 0.00 |
| | Unknown | | 0.00 | 4.31 | 2.43 | 4.31 | 1.00 |
| **TOTALS** | | **6.22** | **2.46** | **7.84** | **4.42** | **14.06** | **3.27** |

Density = miles by surface type / area in sq. mi.

Shaded area is used to calculate Open Road Density.

| Open Road Density | BLM Lands * | |
|---|---|---|
| | miles | density |
| OPEN | 6.88 | 2.72 |
| CLOSED | 1.02 | 0.40 |
| TOTALS | 7.9 | 3.13 |

*includes BLM control on non-BLM