CROOKED CREEK ANALYSIS AREA

ENVIRONMENTAL ASSESSMENT

No. OR 090-EA-01-04

CONTENTS

Appendix B

Crooked Creek Analysis Area No. E-01-205
Environmental Assessment No. OR 090-EA-01-04

1.0 PURPOSE OF AND NEED FOR ACTION

1.1 Introduction

The Bureau of Land Management (BLM) proposes the Crooked Creek Timber Sale that would implement timber harvesting activities on approximately 150 acres of BLM lands in T. 15 S., R. 2 W., Secs. 22 and 23. The proposed harvest area is located approximately 4 miles north of Marcola, Oregon. A map of the harvest areas is attached. A watershed analysis has been completed for the Mohawk/McGowan Watershed Analysis Unit. The watershed has approximately 88,000 acres of which the BLM manages approximately 22,780 acres or 25.9 percent. The BLM inventory records indicate the stands being considered for commercial thinning are predominantly 40 years old.

Timber harvesting would occur on lands allocated as "Matrix" and “Riparian Reserve” as described in the Northwest Forest Plan and the 1995 Eugene District Resource Management Plan (RMP). Matrix lands are those Federal lands outside areas identified in the Northwest Forest Plan Record of Decision (ROD) with special restrictions because of other resource values. Riparian Reserves are designated areas that include the Riparian Area and upland area within a designated distance from the stream. Portions of the Matrix are available for timber production and other silvicultural activities as long as the Standards and Guidelines included in the ROD are followed (U.S. Bureau of Land Management and U.S. Forest Service 1994, pp 7, 10, C-39). In order to meet the silvicultural objectives of the RMP and this proposal, BLM administered lands are being proposed for treatment. If the “no action” alternative is selected on this proposal, additional areas would be proposed to meet RMP silvicultural objectives.

The Crooked Creek Analysis Area was previously analyzed in December 1997 in EA No. OR 090-97-40 and the EA was revised in 1999 and reissued under EA No. OR 090-99-14. We received one comment letter on the 1997 EA from Emerald Trail Riders Association, and one comment letter from Oregon Natural Resources Council on the 1999 revision. Since December 1998, the U.S. Forest Service and U.S. Bureau of Land Management have developed a Supplemental Environmental Impact Statement (SEIS) “For Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines” November 2000. This SEIS proposes to better identify protections needed, clarify language, eliminate inconsistent and redundant direction, and establish a process for responding to new information. This EA is updated to be in compliance with the SEIS ROD. The original need for action still applies and it is as follows:

1.2 Objectives:

The proposed treatments would meet the following management objectives:

- Fulfill the BLM's mission and policy of providing wood products and jobs in the General Forest Management Area (Matrix) for Fiscal Year 2001.
- Help the Eugene District meet its commercial thinning harvest commitment for FY 2001
- Comply with the Standards and Guidelines in the Record of Decision (ROD) for the Northwest Forest Plan.
- Manage Matrix lands by commercial thinning to capture mortality, reduce stocking density and redistribute growth and yield to the remaining stand.
- Manage a portion of the Riparian Reserves by density management thinning to reduce stocking density and redistribute growth to the remaining stand.
- Construct permanent and temporary roads for timber harvesting, improve roads by replacing or eliminating culverts and decommissioning roads not needed for the foreseeable future.

1.3 Conformance

The proposed action and alternatives are in conformance with the *Record of Decision* (ROD) *for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl*, April 1994, and the *Eugene District Record of Decision and Resource Management Plan*, June 1995 (Eugene District ROD/RMP) as amended by the *Record of Decision* (ROD) *for Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines*, January 2001. The analysis contained in these EIS's are incorporated into this document by reference.

The above referenced documents are available for review at the Eugene District Office or on the internet at http://www.or.blm.gov/nwfp.htm. The Analysis File contains additional information used by the interdisciplinary team (IDT) to analyze impacts and alternatives and is hereby incorporated by reference.

1.4 Scoping

The scoping process identified the agency and public concerns relating to the proposed projects and defined the issues and alternatives that would be examined in detail in the EA. The general public was informed of the planned EA by the inclusion of this project in the Eugene District Planning Update "Eye to the Future" in the Summer 1996, Winter/Spring 1997 and February 2001 issues (approximately 250 mailings).

1.5 Identified Issues:

1.5.1 Issue #1 - How would timber harvest and road related activities affect soil productivity?

1.5.2 Issue #2 - What would be the effect of harvesting and road management on the timing and magnitude of peak flow? Peak flow is defined as the highest instantaneous rate of streamflow attributable to a particular rainfall or snowmelt event.

1.5.3 Issue #3 - What would be the effect of harvesting and road management activities on erosion and sediment delivery to water bodies?

1.5.4 Issue #4 - What would be the vegetative response to commercial thinning in the Matrix and density management in the riparian reserves?

1.5.5 Issues Identified but Eliminated from Analysis:

1.5.5.1 What are the effects to Survey and Manage and Protection Buffer Species?

All species requiring surveys under the SEIS ROD were surveyed using current protocols and would be managed using the most current management recommendations. The issue of how the Proposed Action and alternatives would impact Survey and Manage Species was not analyzed because all Survey and Manage wildlife and botanical species (as defined by the January 2001 Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines) have been surveyed and subsequent sites would be managed as required under this ROD.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

This section describes alternatives identified by the IDT, comparison of alternatives and a summary of environmental effects. Design features associated with these alternatives and detail information can be found in the Appendices. Detailed information can be found in the Crooked Creek Analysis Area file.

2.1 Alternative I - Proposed Action

This alternative would commercially thin approximately 93 acres of upland, density manage approximately 52 acres in riparian reserves. The BLM proposes to construct approximately 0.3 miles of permanent rocked road, 0.3 mile of temporary road, install a new ditch relief culvert and replace an old log culvert with a new metal culvert. The proposal would also decommission 0.3 mile of new temporary road and 0.9 mile of existing road.

2.1.1 Logging

In all areas logging would be accomplished by a combination of cable yarding and an option of using ground based equipment on slopes of 35 percent or less. Ground-based yarding would be seasonally

restricted to dry periods, see specifics in Appendix B, Project Design Features for All Action Alternatives. In the cable yarded portion, one-end suspension of logs would be required. Total harvest volume would be approximately 1.1 million board feet. Sales of additional timber for tractor skid trails and cable yarding corridors would be consistent with BLM policy. The proposed action by harvest area is as follows:

2.1.2 Upland

Approximately 93 acres of a 40-year-old second growth Douglas-fir stand would be commercially thinned. Approximately 0.6 mile of new road would be constructed to facilitate harvest. The new road construction is located on ridge tops of upper slopes outside of riparian reserves. Approximately 0.3 mile would be rock surfaced and permanent; the remaining 0.3 mile would be temporary with natural surfacing. The rocked road (Spur A) would be blocked upon completion of harvest activities. The temporary roads (Spurs B and C) and any existing roads within the harvest areas that are used for harvest activities (i.e.: trails near Spur A) would be blocked, tilled and waterbarred where necessary after harvest operations (refer to the Proposed Action map for location of the Spurs). Road No. 15-2-23.3 would be blocked at the junction with Road
No. 15-1-19 and the entire surface tilled and drainage reestablished. A failing log culvert on road No. 15-1-19 at stream No. 4 would be replaced with a new culvert sized to meet a theoretical 100 year storm event. The failing log culvert on Road No. 15-2-26.1 at stream No. 7 would be removed and the portion of Road No. 15-2-26.1 between Road No. 15-2-22.1 and Spur A would be decommissioned because this portion of the road is not needed for future management access. A new ditch relief culvert (cross drain) would be installed east of Spur B on Road No. 15-2-24 to minimize the potential for direct sedimentation of a live stream (refer to Appendix B, Project Design Features (PDF) 9 and 10).

The commercial thinning harvest prescription would reduce the number of conifer trees per acre from approximately 120 to 100, and reduce the conifer basal area from 158 sq. ft. to approximately 132 sq. ft. The average conifer tree spacing after harvest would be approximately 21 feet. Trees selected for harvest would be the suppressed, intermediate, and some co-dominant Douglas-fir trees.

2.1.3 Riparian

Approximately 52 acres of Riparian Reserves would be thinned to increase stand diversity and structure by modifying the even stocking and density of the stand into a less dense, less homogenous and more diverse stand. The portions of the Riparian Reserves to be thinned would have the following prescription: reserve trees greater than 18 inches DBH; tree spacing maximum at 20 feet both for conifers and hardwoods; a minimum of a 75-foot no treatment zone buffer on non-fish bearing streams and a 100 foot no treatment zone buffer on fish bearing streams. The majority of the riparian reserve thinning would not be placed at the minimum buffer zone but would be placed along natural topographic breaks such as the first slope break above the flood plain of Crooked Creek. No riparian reserves with moderate or high slope stability risk would be thinned. No landings or roads would be constructed within riparian reserves.

2.2 Alternative II - No Action

There would be no commercial thinning of the Matrix upland nor Density management of the riparian

timber resource nor road construction, road improvement or decommissioning proposed under this alternative.

2.3 Alternative III - No Riparian Thinning

This proposal would be similar to Alternative I except for the following: The 52 acres of riparian reserves would not be thinned. Spur A would be relocated to the north utilizing an existing old road grade for the first 400 feet. The Spur would then follow the location out on the ridge as in Alternative I, would not be rock surfaced and would be blocked, tilled and waterbarred at the junction of the new construction with the existing road/trail. The failing log culvert on Road No. 15-2-26.1 at stream No. 7 would be replaced with a culvert sized to a 100-year theoretical storm event and Road No. 15-2-26.1 would not be decommissioned. Road No. 15-2-26.1 would continue to provide access between Crooked Creek drainage and Dollar Road No. 15-1-31. The road access retained would be available for recreational uses but not likely for management access.

2.3.1 Logging

Logging would be the same as Alternative I.

2.3.2 Upland

Commercial thinning in the upland would be the same as Alternative I. Total harvest volume would be approximately 700 MBF.

2.3.3 Riparian

No harvesting would occur in the riparian reserves. The riparian reserve width would be 200 feet for non-fish bearing streams and 400 feet for fish bearing streams.

2.4 Post Harvest Activities

2.4.1 Slash Disposal and Hazard Reduction - Cover and burn any road side and landing piles. Landing debris remaining after logging would be made available for special forest products sales if access is not blocked by road and skid trail mitigation.

2.4.2 Road Improvement and Closure - For the Proposed Action, existing Road No. 15-2-26.1, Road No. 15-2-23.3, and all newly constructed temporary Spur roads (Spurs B and C) would be blocked, tilled and waterbarred after harvest operations. The culvert at stream 4 would be replaced and a new cross drain installed near Spur B.

For Alternative No. III, Road No. 15-2-23.3 would be blocked, tilled and waterbarred. The culvert located at stream No. 7 would be replaced. The newly constructed natural surfaced spur roads would be blocked, tilled and waterbarred.

2.5 Monitoring

Monitoring guidelines are established in the 1995 FRMP/ROD, pp. 175, and the 1994 Standards and guidelines, pp. E-1 to E-10.

2.6 Comparison of Alternatives

Table 1 Comparison of Alternatives

Actions	**Alternative I**	**Alternative II**	**Alternative III**
Type of Harvest	Comm. Thinning Upland - 93 ac. Dens. Mgt. Riparian - 52 ac	None	Comm. Thinning Upland - 93 ac.
Proposed timber volume to be removed (MBF)	1100	None	700
Sale Area Size	145 acres	0	93 acres
Roads constructed	Permanent: 0.3mi (Spur A) Temporary: 0.3 mi (Spurs B and C) unsurfaced 0.3 mi temp. tilled	0	0.6 mi (Spurs A,B,C) temporary unsurfaced 0.6mi temp. tilled
New roads remaining after harvest but blocked	Spur A - 0.3 mi.	0	0
Existing roads tilled	0.9mi	0	0.7mi
New roads remaining after harvest, open	0	0	0

2.7 Comparison Summary of the Predicted Environmental Effects of All Alternatives.

Resource Concern	Alternative I Proposed Action	Alternative II No Action	Alternative III
Effects to T & E	None for bald eagles. (See 3.2.1) Degrade dispersal may affect but is not likely to adversely affect spotted owls. (See 3.2.2 and 5.4)	None	None for bald eagles. (See 3.2.1) Degrade dispersal may affect but is not likely to adversely affect spotted owls. (See 3.2.2 and 5.4)
Effects to Fisheries	Sediment from roads would be reduced with removal or replacement of problem culverts, installation of a ditch relief culvert, and road closures. Upstream fish migratory patterns could be enhanced by replacing or eliminating barrier culverts. Sediment input from recreation trails would continue. (See 3.7 and 4.1.3)	Sediment from roads and trails would continue to be delivered to streams. Migration barriers would continue to impede upstream fish movement. (See 3.7 and 4.2.3)	Effects would be the same as those in the Proposed Action. (See 3.7 and 4.3.3)
Effects to Water Quality	Water quality would be improved as a result of improvements on permanent roads and restoration work on roads no longer needed. (See 3.5, 4.1.3)	Roads/trails would continue to erode and deliver sediment to streams. (See 3.5, 4.2.3)	Same as Proposed Action. (See 3.5, 4.3.3)
Effects to Soil Productivity	Irreversible loss of soil productivity on 0.3 mi (0.75 ac) by rocking Spur A. Tillage would recoup infiltration and soil productivity on 0.6 mi. (1.9 total acres) of existing compacted native surfaces/old skid trails and 0.15 mi. of newly constructed temporary road (Spur C). (See 3.4, 4.1.1)	Existing compacted native surfaces would persist on the landscape into the future, contributing to the loss of soil productivity on approximately 1.5 acres. (See 3.4, 4.2.1)	Tillage would recoup infiltration and soil productivity on 0.6 mile (2.4 total acres) of existing compacted native surfaces and 0.35 mile of newly constructed temporary road. (See 3.4, 4.3.1)
Effects to Riparian Vegetation	Increased growing space, accelerated growth rate. Larger diameter trees in a shorter time frame. (See 3.1, 4.1.4)	Suppressed growth rates, growth slows as stand age increases. Maintains higher rate of mortality . (See 3.1, 4.2.4)	Same as Alt. II. (See 3.1, 4.3.4)

3.0 AFFECTED ENVIRONMENTS

3.1 Vegetation:

The upland portion of the harvest area is a second growth stand of Douglas-fir approximately 40 years old. The stand was precommercially thinned approximately 20 years ago. The stand also contains bigleaf maple clumps, alder, cedar, and hemlock. Brush species include vine maple, hazel, and a ground cover of Oregon grape, sword fern, and salal. Most of the stand contains a single story canopy with few snags and down logs.

The riparian area is a second growth stand approximately 40 years old, composed primarily of Douglas-fir and red alder. Crooked Cr. has an alder dominated riparian zone within 50-100 feet of the stream along the majority of its length in the project area. Previous management (timber harvest) and lack of management (vegetation control) actions have allowed alder to continue to dominate portions of the riparian habitat. As in the uplands, there are few snags and down logs.

3.2 Threatened and Endangered Wildlife:

3.2.1 Bald Eagle (Threatened)

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

3.2.2 Northern spotted owl (Threatened)

Suitable nesting habitat for this species is mature forest (generally greater than 80 years old) with high canopy cover, an open understory, large down logs and large snags. There is no suitable habitat for spotted owls within or adjacent to the proposed project area. Dispersal habitat for spotted owls is generally defined as stands ranging from 40 to 79 years of age. There are 145 acres of dispersal habitat in areas proposed for harvest in the action alternative. There are no spotted owl activity centers, Unmapped Late Successional Reserves (LSR) or designated Critical Habitat within 0.25 mile of the proposed harvest areas.

3.3 Survey and Manage:

Botany

Surveys for species requiring predisturbance surveys have been completed. No bryophytes and lichen species requiring management of sites under the FSEIS ROD were found in the project area. Under the FSEIS ROD, surveys for additions to the list of species requiring surveys are not required until 2003. Refer to the project file for the list of species for which surveys were required.

Wildlife

Surveys were conducted for Survey and Manage mollusks within the project area in 1998. One megomphix was located within Linn County and five megomphix sites were located within Lane County. All six of these megomphix sites would have buffers established around them as per current management

recommendations for this species (IM-OR-2000-015). These surveys also identified four papillose taildropper and three blue-gray tail-dropper sites. As these species are no longer on the Survey and Manage list, these sites would not be retained. No surveys were required under the ROD for the Crater Lake tightcoil because the proposed project area is below 2000 ft elevation and so is not considered suitable habitat for this species. No Crater Lake tightcoils were found incidentally during other mollusk surveys.

All proposed project units are suitable habitat for the red tree vole (*Arborimus longicaudus).* All units were surveyed using current protocols for red tree voles and one inactive red tree vole nest was found within proposed units. Under current management recommendations (IM-OR-2000-086) there is no requirement to establish a Habitat Area for this inactive nest so there would be no management for red tree voles within the project area.

3.4 Soils:

Soils found within the analysis area are in the McCully series (60% of the area), the Hembre series (25% of the area), and the McAlpin series (15% of the area). Site specific features of these soils are as follows:

McCully soils are deep (40 to 60 inches), well drained and productive. They occur on the more gradual upland portions of these harvest areas where slopes range from 5 to 45%. The surface layer is a clay loam, the subsoil is typically clay. Permeability is moderately slow due to the heavy textures and the absence of coarse fragments. Consequently, these soils are particularly susceptible to compaction.

Hembre soils are deep (40 to 60 inches), well drained and moderately productive. They occur on the steeper side slopes and within certain Riparian Reserve portions of the harvest areas north of Crooked Creek (Harvest Areas 2 - 6) where slopes range from 40 to 80%. The surface layer is a silt loam, the subsoil is silty clay loam. Coarse rock content is typically less than 15% in the upper portions, increasing to 40% at depth. Permeability is moderate. Surface erosion is a concern for these soils.

McAlpin soils are deep (> 60 inches ave.) and moderately well drained. They formed in alluvium on the flood plain of Crooked Creek where slopes are less than 5%. The surface layer is a silty clay loam, the subsoil either silty clay or clay. These soils will be largely unaffected by this proposal as they occur as a thin band within the protected riparian zone.

Current Condition:
The current condition shows evidence of productivity impairments due to deep, persistent compaction. Multiple old natural surface skid trails used for previous harvest have been reinforced and extended by off road vehicle use. Portions of these are severely rutted, continuing to erode, and some segments have the potential for negative impacts to water quality outside of the proposed Harvest Areas. Approximately 0.9 miles of compacted trails exist within Harvest Area Nos. 5 and 6, and the Riparian Reserve between (Stream #9). Most of this length (80%) is used by 4X4 vehicles and averages 15 feet wide. Another 0.15 miles of compacted trails exist in Harvest Area No. 3 which is also traveled by 4X4 vehicles. These trails account for approximately 2.2 acres of soil productivity loss largely contained in portions proposed for ground-based harvest.

3.4.1 Timber Productivity Capability Classification (TPCC)

Approximately 5 acres with high potential for mass wasting was identified /classified as FG/FP-W within the analysis area north and east of Harvest Area 6. This area was reserved from harvest due to slope stability concerns as indicated by steep slopes over 75%, distorted timber (i.e. "pistol butted") and active soil creep downslope. Approximately 20 to 25 acres are classified as RM/RS-R. These areas have moisture restrictions for reforestation due to patches of surface rock, skeletal soils, and steep slopes with inclusions of shallower soils than those described above. These droughty soils occur in all of Harvest Area 8, and portions of Harvest Areas 3 and 5. Thinning is not a concern on these sites. No other fragile sites or low productivity soils inappropriate for timber harvest activities were found to occur within the analysis area.

3.5 Water Quality:

The Mohawk River below river mile 25 is listed on the 1998 D.E.Q. Water Quality Limited List (303(d)) for elevated summer water temperatures. Water temperature was monitored in Shotgun Creek during 1998 and 1999 and did not exceed state standards. Data was collected on Shotgun Creek and Crooked Creek during the summer of 2000 and both creeks meet state standards at this time. Shotgun Creek and the Mohawk River were on the 1996 Waters of Concern list for sediment, however no data was collected to support listing these streams on the D.E.Q. 303(d) list.

3.6 Hydrology:

The proposed harvest areas are adjacent to Crooked Creek in the Mohawk/McGowan 5th Field Watershed. Crooked Creek is a 4th order tributary of Shotgun Creek. Below the confluence with Crooked Creek, Shotgun Creek is a 5th order stream that flows into the Mohawk River north of Marcola. Annual precipitation ranges from 40 – 90 inches per year, with the majority occurring between October and April. Approximately 82% of the land in the watershed is in the rain dominated zone, 14% in the transient snow zone between 2,130 - 2,810 feet in elevation, and 4% in the snow dominated zone. The sale units for the Crooked Creek timber sale total 145 acres in the Shotgun drainage and are within the rain dominated zone. The timber in the sale units is considered to be hydrologically mature because the canopy is closed and can intercept some of the direct precipitation by absorption.

Identified beneficial uses of water in this area are: aesthetics, resident fish and aquatic life, salmonid spawning and rearing, water contact recreation, fishing, and water supply. According to records obtained from the Lane County Watermaster, there are no water right permits on Crooked Creek. Two water right permits were issued downstream from the analysis area for Shotgun Creek at the BLM recreation site. On the Mohawk River, between Shotgun Creek and Marcola, there are six permits for irrigation and domestic uses.

3.7 Fisheries:

Several fish bearing streams are present in the analysis area. The largest stream, Crooked Creek (tributary 1), flows west to east through the project area and is thought to be a steelhead and rainbow trout bearing stream. However, to date only cutthroat trout and sculpin have been identified in the

mainstem of Crooked Creek. Information is incomplete or lacking about the use and distribution of steelhead and rainbow trout in the Crooked Creek system. Aquatic habitat condition along Crooked Creek is predominantly a pool-riffle/rapid type. Accumulation of LWD (large woody debris) is scattered as individual pieces or found in small clumps or jams. LWD is thought to be moderate to low in abundance when compared with quantities found in other third order stream systems in physically similar locations. Riparian vegetation is primarily composed of hardwoods immediately adjacent to stream banks.

Tributary 14 is a first order stream which joins the mainstem Crooked Creek near the eastern boundary of the analysis area. Cutthroat trout were found in the stream segment between Road Nos. 15-1-19 and 15-2-24. The culvert at Road 15-2-24 limits the passage of fish upstream of the road. Tributary 14 is a deeply incised channel with a step-pool aquatic habitat classification. Silt, sand, and small gravel sized material dominate the stream substrate throughout tributary 14. Riparian vegetation consists of a mixture of hardwood and conifer species.

Tributaries 6 and 7 flow together to form a second order tributary to Crooked Creek. Cutthroat trout were found in both stream channels up to the point where roads cross the drainage. The culvert on Road 15-2-22.1 at tributary 6 is undersized and bars upstream fish movement and the passage of bedload materials. There is approximately 1000 feet of potential fish habitat above the culvert blockage. Roughly 8 to 10 feet of stream channel has been downcut by the force of water discharged from the undersized culvert. Bedload material unable to move through the culvert has accumulated on the inlet side of the pipe and necessitated the placement of a second culvert situated above the first to facilitate water movement. A transportation team has assessed the area and are currently working up plans for restoration. A future EA would be prepared proposing to restore this stream crossing. A log culvert located on Road 15-2-26.1 at tributary 7 shows some evidence of subsidence and other signs of possible failure. The culvert is less of a fish passage concern than it is a sediment delivery concern. The overly steep road approaches to the log culvert are additional contributors of sediment directly to tributary 7. Aquatic habitat in both tributaries are similarly steep, step-pool type channels. Accumulations of older, large diameter logging slash characterizes the LWD found in each channel. Riparian vegetation is primarily hardwood trees species.

3.8 Recreation:

The project area is located within the boundary of the MRAMP (Mohawk Recreation Area Management Plan). It includes single and dual-track trail segments used by OHV (Off Highway Vehicle) enthusiasts. Trail mileage within the project area totals approximately 1.4 miles. Much of this distance stems from road originally constructed for timber harvest. Gravel roads bordering the project area are used by motorized and non-motorized trail enthusiasts to access trails within, and adjacent to, the project area.

Trails located within the project area, and the majority of those located immediately adjacent to the project planning boundary, were not analyzed for trail designation status under the Shotgun Trail environmental assessment (OR090-EA-00-04). Consequently, no decision was made as to whether such trails will remain open and managed for long-term trail recreation. A separate planning effort is currently underway to determine whether or not such trails will be retained or closed.

The project area is bordered by a system of maintained roads that enable easy visitor access. Consequently, in addition to motorized and non-motorized trail recreation activities supported by this infrastructure, other dispersed recreational activities (e.g., camping, hunting, target shooting, etc.) are likewise facilitated within and adjacent to the project area.

4.0 ENVIRONMENTAL CONSEQUENCES

This Chapter incorporates the analysis of cumulative effects in the *USDA, Forest Service and the USDI, Bureau of Land Management Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Related Species Within the Range of the Northern Spotted Owl*, February 1994, (Chapters 3 & 4), Final Supplemental Environmental Impact Statement *For Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines*, January 2001, (Chapters 3 & 4) and the *Eugene District Proposed RMP/EIS*, November 1994 (Chapter 4). These documents analyze most cumulative effects of timber harvest and other related management activities. None of the alternatives in this proposal would have cumulative effects on resources beyond those effects analyzed in the above documents. The following analysis includes cumulative effects that supplement those analyzed in the above documents, and provides site-specific information and analysis particular to the alternatives considered here. Aquatic Conservation Strategy Objectives are listed in Appendix A.

4.1 Alternative I - Proposed Action

4.1.1 Issue #1 - How would timber harvest and road related activities affect soil productivity? This specifically concerns the following actions:

- Timber Harvest with ground-based systems on approximately 55-60 acres. Harvest with cable systems on approximately 85-90 acres.
- Construction of 0.3 mile of permanent graveled road (Spur A).
- Tillage and blocking of 0.6 mile of existing compacted native surfaces/old skid trails.
- Construction and tillage of 0.15 mile of temporary road (Spur C).

Direct and Indirect Effects

Impacts to soils from commercial thinning activities would be in the form of soil compaction, and displacement of surface soil and organic material due to harvesting. Soil porosity is an essential component of site productivity. It is instrumental in water infiltration, water storage and gas exchange. Soils with good porosity create favorable conditions for root growth, water movement, and nutrient uptake by roots, and mychorrhizal growth. Cable yarding systems typically result in 2% or less of the harvest area left in a compacted condition, a level within Eugene District standards for achieving insignificant growth-loss effect. The residual effect of soil compaction within yarding corridors would remain on site for 10 to 35 years depending upon the depth of compaction within individual yarding corridors.

Ground-based harvesting has the potential for greater reductions of macropore space than cable systems through the compaction of surface and subsurface soil. The direct effect of ground-based harvesting

would result in more area impacted, as compared to cable yarding systems, up to 10 percent of the area versus 2 percent for cable. Consequently, with more ground area disturbed by yarding machines, the likelihood of compaction increases. The compaction resulting from ground-based harvesting could be satisfactorily mitigated by subsoiling all skid trails and other compacted areas, thus achieving insignificant growth-loss from compaction.

Existing compacted native surfaces would be utilized for ground-based harvest and reclaimed by tillage and blocking. The direct and indirect effects would be the restoration of infiltration characteristics and productivity on these acres. Realizing these positive effects would be dependent on effectively blocking the treated acres to OHV traffic.

Irreversible Effects
The construction and gravel surfacing of 0.3 mile of permanent road (Spur A) constitutes an irreversible, long term loss of soil productivity on approximately 0.75 acre. This effect would persist for the life of the road.

Cumulative Effects
Planned road construction, road decommissioning, and tillage under the Proposed Action would result in a net decrease in the area/acres currently identified as non-productive compacted road and trail surfaces.

4.1.2 Issue #2 - What would be the effect of harvesting and road management on the timing and magnitude of peak flow? Peak flow is defined as the highest instantaneous rate of streamflow attributable to a particular rainfall or snowmelt event. This specifically concerns the following actions:

- Commercial thinning approximately 93 acres of 40-year-old conifers in the Matrix LUA, and 52 acres in the Riparian Reserve LUA.
- Construction of 0.3 mile of permanent road (Spur A).
- Construction of 0.3 mile of temporary road (Spurs B and C). These roads would be blocked and tilled following harvest.
- Tilling, blocking, and reestablishing stream channel drainage on Road 15-2-23.3.
- Blocking and reestablishing stream channel drainage on a portion of Road 15-2-26.1.
- Adding a cross drain on Road 15-2-24.
- Repair a failing culvert on permanent Road 16-1-19.

Direct and Indirect Effects
Generally, peak discharge increases in excess of 10% are considered to have notable impacts on channel stability (Washington Forest Practices Board, C-40). The proposed harvest area is completely within the rain dominated zone and commercial thinning is not expected to impact peak flows under normal storm conditions. Under unusual storm conditions where there are warmer winter temperatures, higher wind velocities, and a deeper snow pack, peak flows downstream from the harvest area could increase about 1% as a result of thinning operations. The change in water available for runoff under this action is considered to be a low risk for increased flood damage or bed scour because the increase in peak flow is well below the 10% threshold described above. The potential slight increase during unusual storms is considered a short-term impact until the canopy grows back together.

Constructing permanent roads in ridgetop locations for this harvest and future use would not have negative effects to stream flows. Adding a cross drain on Road 15-2-24 would have the direct effect of reducing road related run-off to an adjacent stream. Utilizing temporary roads for harvesting activities, followed by decommissioning, would indirectly protect streams from long-term road related run-off at those locations. Decommissioning existing roads no longer needed would also reduce potential for long-term road related run-off.

The combination of temporary road construction, permanent road construction in ridgetop locations, road repairs, decommissioning, and the use of the Standards and Guidelines for timber harvesting is expected to result in an overall reduction of run-off reaching the stream system during winter storm events. As a result, the timing and magnitude of in-stream flows would be maintained or restored to a more natural condition and the intent of ACS Objective 6 would be met.

Cumulative Effects

No detrimental cumulative effects to stream flow is anticipated from implementing the Proposed Action. Improving drainage conditions of the permanent road system and decommissioning roads no longer needed would reduce the amount of road related run-off currently entering the stream system. These actions would result in an improved condition of this part of the watershed. Likewise, implementation of this alternative, combined with other road maintenance and restoration work (both on BLM and private lands) would result in a reduction of road related run-off to streams in the Mohawk Watershed.

4.1.3 Issue #3 - What would be the effect of harvesting and road management activities on erosion and sediment delivery to water bodies? This specifically concerns the following actions:

- Rock surfacing 0.3 mile of permanent road (Spur A).
- Construction of 0.3 mile of temporary road (Spurs B and C).
- Removing two failing log culverts and replacing one with a new culvert sized to the 100-year storm event. At the other location the stream channel would be restored to a natural configuration.
- Adding a new cross drain on Road 15-2-24.
- Decommissioning roads no longer needed for management purposes. Tilling, blocking, and reestablishing stream channel drainage on Road 15-2-23.3. Tilling and blocking Spurs B and C after harvest. Blocking, waterbarring, and reestablishing stream channel drainage on a portion of Road 15-2-26.1.
- Commercial thinning approximately 93 acres of 40-year-old conifers in the Matrix LUA, and 52 acres in the Riparian Reserve LUA.

Direct and Indirect Effects

Direct effects include the temporary addition of sediment to streams during the removal of the fill material at stream crossings, both on roads to be repaired and roads to be closed. The impacts to the streams at these locations are expected to be short-term, as the first fall rains following the activity would move the sediment downstream. Replacement of the failing stream crossing structure on the permanent road and removal of the two crossings on roads no longer needed would improve long term conditions and reduce the amount of sediment that could enter the adjacent streams (meets ACS Objectives 4, 5). By restricting equipment operation in stream channels and conducting the work during low flow periods (July

15 to October 15) prior to fall rains, the amount of sediment delivered to streams can be minimized. Sizing the permanent crossing to accommodate a 100-year storm event would maintain the natural sediment regime and reduce the potential for plugging by debris (meets ACS Objective 5). Minor excavation to restore the natural stream channel configurations on roads to be closed and tilling those roads where subgrade conditions allow would minimize future sediment recruitment from the road prism (meets ACS Objectives 3, 5). Restoration of the stream banks and channel bottoms at those locations would eliminate existing artificial barriers to sediment transport.

Indirect effects include impacts to the channel farther downstream as a result of movement of the sediment generated during fill removal at the stream crossings. Again, this impact is anticipated to be short-term as the fall and winter storms would disperse the sediment through the system downstream. Sediment and bedload materials stored in the channel above undersized culverts may mobilize after pipe replacement and move downstream during high streamflow events. The placement of additional relief drainage features to improve existing roads would have no direct effects to channels, but would have the indirect effect of reducing the amount of sediment from these roads delivered to streams. Rock surfacing permanent roads (especially in an area with active Off Highway Vehicle use) would have the indirect effect of reducing potential sedimentation.

No direct or indirect effects are anticipated from new temporary road construction because no stream channels would be crossed and none of the proposed spur roads are located in the Riparian Reserves. Likewise, no direct or indirect sedimentation would be expected from harvest activities since no thinning would take place within 75 feet of non-fish bearing streams, or 100 feet of fish bearing streams, or on any potentially unstable slopes. No negative impacts to aquatic habitat condition are anticipated. Buffers are expected to provide adequate protection to stream channels and therefore, the fisheries resource.

Cumulative Effects

The Mohawk/McGowan WA indicated that erosion from roads has increased sediment production over natural levels, particularly in the Shotgun subbasin. Implementation of this proposal, combined with other ongoing and planned future road renovation and restoration work in the Shotgun drainage (both on BLM and private lands) would result in a reduction of road-related sediment delivery to streams in the future.

4.1.4 Issue #4 - What would be the vegetative response to commercial thinning in the Matrix and density management in the riparian reserves? Specifically, consider (1) tree size and vigor and (2) understory vegetation response.

Direct and Indirect Effects

The direct effects would be the disturbance to understory vegetation, mechanical damage to residual trees, e.g. stripping of limbs, stem damage and broken tops. The indirect effects would be the release from competition conifer and hardwood trees thereby capturing the increase in sunlight, moisture and nutrients. Conifers and hardwoods released by commercial thinning or density management allows retained trees to expand root systems and tree crown depth and width. Typically, conifers and hardwoods would show an increase in stem diameter and height growth for a period of approximately 15 years. The expected effect would be for the retained trees to accelerate diameter growth for the initial 15 year period thereby developing larger size trees for potential snags and/or large woody debris. In

addition, the increase in sunlight reaching the forest floor, due to the thinning of the forest canopy, would result in an increase in understory vegetation.

Cumulative Effects
Altering the riparian forest overstory, and mechanical damage to understory vegetation in combination with the commercial thinning of the upland vegetation creates a local pattern of disturbance. Within the context of the watershed scale, the effects of the thinning become moot because of the relative scale of the project and watershed. A more appropriate scale for comparison is the Crooked Creek basin scale. The Crooked Creek basin comprises approximately 5.12 sq. mi. or approximately 3,277 acres. Previous timber harvest activities in the basin include approximately 370 acres of regeneration harvest (clearcut) 15 or more years ago and a recent (less than 10 yrs., 90 acres) regeneration harvest with 8-10 leave trees per acre. No other commercial thinning treatment has been completed within the basin. Cumulatively the basin has approximately 4 percent of the timber stands less than 10 years old, 11 percent between 10 and 20 years old and 85 percent older than 20 years. Implementing this proposal would disturb approximately 4.5 percent of the basin via the thinning prescription. Consequently, short term effects on 4.5 percent of the area would be a reduction of canopy density, an increase of slash coverage of the forest floor and additional growth of understory vegetation. When compared to the untreated portions of the basin the treated portions would appear visually different and by consequence of increased sunlight reaching the sub-canopy level be richer in biomass of species other than suppressed conifers.

4.2 Alternative II - No Action

4.2.1 Issue #1 - How would timber harvest and road related activities affect soil productivity?
The following activities would **not** occur:

- Construction of 0.3 mile of permanent road.
- Tillage and blocking of 0.6 mile of existing roads/skid trails.
- Construction of temporary roads.

Direct and Indirect Effects
In comparison with the Proposed Action, no additional soil compaction or soil displacement would be incurred beyond what occurs currently since no harvesting or road construction would be conducted. Soil porosity in the existing road segments targeted for decommissioning under the Proposed Action would not be rehabilitated through tillage. Impaired infiltration, water storage, and gas exchange would persist along these road segments with the corresponding productivity losses.

Cumulative Effects
Existing native surface roads would persist on the landscape in a compacted condition, constituting a loss of productive acres within the treated stand. Active erosion would continue, leading to further productive losses and sediment delivery to nearby streams.

4.2.2 Issue #2 - What would be the effect of harvesting and road management on the timing and

magnitude of peak flow? Peak flow is defined as the highest instantaneous rate of streamflow attributable to a particular rainfall or snowmelt event. The following activities would **not** occur:

- Commercial thinning approximately 93 acres of 40-year-old conifers in the Matrix LUA, and 52 acres in the Riparian Reserve LUA.
- Construction of 0.3 mile of permanent road (Spur A).
- Construction of 0.3 mile of temporary road (Spurs B and C).
- Tilling, blocking, and reestablishing stream channel drainage on Road 15-2-23.3.
- Blocking and reestablishing stream channel drainage on a portion of Road 15-2-26.1.
- Adding a cross drain on Road 15-2-24.
- Repair a failing culvert on permanent Road 16-1-19.

Direct and Indirect Effects
Harvesting and road management would not take place. In the short term, existing stream flows would be maintained in the current condition and no direct or indirect effects are anticipated. In the long term, the direct effect of implementing this alternative would be an increase in surface run-off reaching the stream system via deteriorating roads and ACS Objective 6 would not be met.

Cumulative Effects
Opportunities to improve road drainage at this location would be postponed until a later time. By postponing the road work, conditions could degrade further, resulting in more extensive and expensive repairs in the future.

4.2.3 Issue #3 - What would be the effect of harvesting and road management activities on erosion and sediment delivery to water bodies? The following activities would **not** occur.

- Rock surfacing 0.3 mile of permanent road (Spur A).
- Construction of 0.3 mile of temporary road (Spurs B and C).
- Removing two failing log culverts and replacing one with a new culvert sized to the 100-year storm event.
- Adding a new cross drain on Road 15-2-24.
- Decommissioning roads no longer needed for management purposes. Tilling, blocking, and reestablishing stream channel drainage on Road 15-2-23.3. Blocking, waterbarring, and reestablishing stream channel drainage on a portion of Road 15-2-26.1.
- Commercial thinning approximately 93 acres of 40-year-old conifers in the Matrix LUA, and 52 acres in the Riparian Reserve LUA.

Direct and Indirect Effects
The physical integrity of the aquatic system, water quality, the sediment regime in the basin may not be maintained at the current level. Under this alternative, the Aquatic Conservation Strategy may not be met on these lands because taking no action would not necessarily maintain the current condition of riparian-dependent resources. In particular, long-term road-related sedimentation to streams would continue to occur and potentially escalate because of lack of maintenance. Existing stream crossings in need of repair would not be replaced or removed which could result in mass movement, and short-term water quality

degradation.

Direct sediment input to tributaries Z, 4, 7, and 12 from roads would continue and is expected to increase over time as log culverts degrade further. Sediment input to streams would be chronic and present short-term increases of fine sediments and turbidity during each high stream flow or rain event. Sediment accumulation above undersized or failing culverts would present a higher risk to stream channels and the fisheries resource resulting from catastrophic failure. Vast amounts of road fill and stored bedload material would be mobilized and transported through channels as culverts fail which could adversely alter stream configuration and bank vegetation.

Continued use of Road 15-2-23.3 for recreational access would continue and would be expected to lead to continued sediment impacts to stream Z and the mainstem Crooked Creek. Road 15-2-24 would continue to degrade at approaches to tributary 7 and would be expected to place additional sediment directly into the channel. Road drainage presently introducing sediment directly to tributary 12 would continue without the installation of an additional ditch relief culvert.

Cumulative Effects
Opportunities to improve drainage on the existing roads, restore stream channels, and decommission roads no longer needed would be postponed to a later date. Detrimental effects from possible culvert failures and road introductions of sediment would be expected to continue and it is unknown what the cumulative ramifications may be.

4.2.4 Issue #4 - What would be the vegetative response to commercial thinning in the Matrix and density management in the riparian reserves? Specifically, consider (1) tree size and vigor and (2) understory vegetation response.

Indirect Effects
Under the No Action alternative the silvicultural treatment would not be applied at this time. The result of no action at this time would be to continue on a course of alder domination in portion of the riparian reserves, and slowly the conifers would overtop the hardwoods and gradually shade them out. As trees compete with each other for sunlight, height growth dominates as the major survival mechanism. Tree vigor tends to decrease as the individual tree is competing for growing space. Over time the entire stand is in a battle for growing space and sunlight which results in trees developing small lateral crowns, small root masses and small diameters, due to accelerated height growth. Natural creation of openings in the stands can result in accelerated windthrow adjacent to the openings due to small root mass from overcrowding. Forest pathogens, pests and weather related processes would result in small scale change to the forest until a large event resets the stand to an early seral condition.

Understory vegetation abundance would continue to diminish due to lack of adequate sunlight.

Cumulative Effects
Cumulatively, the effects of no action would result in forest stands that are too dense to carry into the future without risk of density related mortality. Natural stratification of the stand would continue, tree growth would be spread to all trees on site, with a slight bias toward the dominant crown class trees.

Density related mortality issues would be pathogenic, insect infestations and weather related. Overall, leaving the stand at the present density would result in future mortality of small size trees (stem exclusion phase) whose contribution to stand complexity are uncertain.

4.3 Alternative III

4.3.1 Issue #1 - How would timber harvest and road related activities affect soil productivity?

Direct and Indirect Effects
Impacts to soils from the thinning activities would be comparable to those described under the Proposed Action. The resulting compaction and displacement would be satisfactorily mitigated through the use of design features including soil moisture restrictions, designated skid trails, and tillage of compacted surfaces after harvest.

As compared to the Proposed Action, Alternative III would utilize more temporary native surface road to be reclaimed through post-harvest tillage. This would have the indirect effect of restoring productivity on 2.4 total acres as compared to 1.9 total acres in the Proposed Action.

Irreversible Effects
Unlike the Proposed Action there is no permanent surfaced road planned under this Alternative, therefore there would be no long term irreversible effects to productivity.

Cumulative Effects
Comparable to the Proposed Action.

4.3.2 Issue #2 - What would be the effect of harvesting and road management on the timing and magnitude of peak flow? Peak flow is defined as the highest instantaneous rate of streamflow attributable to a particular rainfall or snowmelt event. This specifically concerns the following actions:

- Commercial thinning approximately 93 acres of 40-year-old conifers in the Matrix LUA.
- Use and extending an existing permanent road in a ridgetop location (Spur A).
- Construction of 0.3 mile of temporary road (Spurs B and C).
- Tilling, blocking, and reestablishing stream channel drainage on Road 15-2-23.3.
- Repair failing culvert on Road 15-2-26.1
- Adding a cross drain on Road 15-2-24.
- Repair a failing culvert on permanent Road 16-1-19.

Direct and Indirect Effects
Direct and indirect effects would be comparable to those described under the Proposed Action and implementation of this alternative would meet ACS Objective 6. The only notable difference between the alternatives that could warrant discussion under this issue is that a segment of Road 15-2-26.1 would not be decommissioned and thinning in the Riparian Reserves would not occur. On Road 15-2-26.1, the failing stream crossing would be replaced with a properly sized culvert. This road improvement would protect existing stream flows there to accommodate a 100 year storm event. Not thinning in the Riparian

Reserves would have no effect on stream flows.

Cumulative Effects
Same as Proposed Action.

4.3.3 Issue #3 - What would be the effect of harvesting and road management activities on erosion and sediment delivery to water bodies? This specifically concerns the following actions:

- Commercial thinning approximately 93 acres of 40-year-old conifers in the Matrix LUA.
- Use and extending an existing permanent road in a ridgetop location (Spur A).
- Construction of 0.3 mile of temporary road (Spurs B and C).
- Decommissioning roads no longer needed for management purposes. Tilling, blocking, and reestablishing stream channel drainage on Road 15-2-23.3. Tilling and blocking Spurs B and C after harvest.
- Repair failing culverts on Road 15-2-26.1 and Road 15-1-19.
- Adding a cross drain on Road 15-2-24.

Direct and Indirect Effects
As in the Proposed Action, direct effects include the temporary addition of sediment to streams during the removal of the fill material at stream crossings, both on roads to be repaired and roads to be closed. The impacts to the stream at the individual crossings are expected to be short-term, as the first fall rains following the activity would move the sediment downstream. Replacement of two failing stream crossing structures on the permanent roads, and removal of the one crossing on Road 15-2-23.3, would improve long term conditions and reduce the amount of sediment that could enter the adjacent streams (meets ACS Objectives 4, 5). Sizing the permanent crossings to accommodate a 100-year storm event would maintain the natural sediment regime and reduce the potential for plugging by debris (meets ACS Objective 5). Minor excavation to restore the natural stream channel configurations and tilling Road 15-2-23.3 would minimize future sediment recruitment from the road prism (meets ACS Objectives 3, 5).

Indirect effects would be similar to those described under the Proposed Action. However, spur A would be extended out onto the ridgeline and after harvesting the native surface segment would be blocked to protect those soils from displacement by OHV use. The existing segment of road is pit-run surfaced and would be open to vehicle traffic. Although sedimentation off ridgetop roads is not common, blocking the native surface segment would have the indirect effect of minimizing sediment transport to other roads by the vehicle wheels therefore the effects on fish and fish habitat would be less than alternative II but are expected to be slightly greater than the proposed action.

As in the Proposed Action, no direct or indirect effects are anticipated from new temporary road construction. Likewise, no direct or indirect sedimentation would be expected from harvest activities since no thinning would take place near streams or on any potentially unstable slopes.

Cumulative Effects
Same as Proposed Action.

4.3.4 Issue #4 - What would be the vegetative response to commercial thinning in the Matrix and density management in the riparian reserves? Specifically, consider (1) tree size and vigor and (2) understory vegetation response.

Direct, Indirect and Cumulative Effects
The effects to the uplands would be the same as the Proposed Action and the riparian areas would be the same as Alternative No. II.

5.0 Other Environmental Effects Common to All Action Alternatives

5.1 Prime Farmland and Rangeland

There is no prime farmland or rangeland within the Federal ownership of the proposed harvest units.

5.2 Wetlands and Flood Plains

No wetlands were identified within the proposed harvest area. Since riparian thinning would exclude lands within the active riparian area, floodplain inundation would be unaffected by harvest activities and the intent of ACS Objective 7 would be met.

5.3 Recreation

Alternatives I and III would affect current OHV (Off Highway Vehicle) use where proposed road construction, designated skid trails, and slash accumulations overlap with existing, user-developed, single- and dual-track trails. The effects would occur through the removal of trail tread, creation of trail hazards (e.g., trees protruding onto trails), and/or blockage of trails. In Alternative I the proposed BLM Road 15-2-26.1 partial closure between Spur A and BLM Road 15-2-22.1 would also affect OHV use by removing a short road link between trail segments in the area. Closure of BLM Road 15-2-23.3 would not affect current motorized trail recreation because the trail segment to which it is linked has not been actively used due to windthrown trees. Alternative II would retain access and use as it currently exists.

The proposed timber harvest and road-related activities would modify dispersed recreational use patterns to some degree, such uses (e.g., camping, hunting) would not be precluded.

An interdisciplinary planning team is currently assessing existing trails within the Shotgun drainage to identify which trails are to be closed and others that will remain open and maintained for continued trail recreation opportunities. It is through this trail planning effort that trails located within the proposed harvest area boundary will be evaluated and a decision made as to their long-term retention or closure. Consequently, impacts realized through timber harvest and road closure operations could be mitigated for trails located within the timber harvest boundary that are selected for long-term trail management.

5.4 Threatened and Endangered Species

A biological assessment for Spring Chinook Salmon was completed on April 16, 1999 and submitted to NMFS (National Marine Fisheries Service). A letter of concurrence was received from the NMFS dated August 4, 1999. Reinitiation of consultation is not necessary since changes from the original project are minor and do not change the project scope or introduce new information that would lead to potential effects to listed species not previously considered. The updated project scope is less than that originally consulted upon. Therefore, effects to listed species was considered in all actions and no reinitiation of consultation is warranted.

The assessment of impacts from the project on essential fish habitat was determined to be a no effect. The project would have no effect on water quality or stream substrate material necessary for commercially important marine fish species.

Approximately 145 acres of Northern spotted owl dispersal habitat would be degraded under Alternative 1 and 93 acres of Northern spotted owl dispersal habitat would be degraded under Alternative 3. No owls would be negatively affected by disturbance from the proposed project under either of the action alternatives. Consultation for this proposed project was accomplished in "The Willamette Province Fiscal Year 2000 Habitat Modification Biological Assessment for Effects to Listed Species." Because the proposed project would degrade dispersal habitat in an area where dispersal habitat is not limited, this action resulted in a "may affect but is not likely to adversely affect" determination for the Northern spotted owl. US Fish and Wildlife Service gave concurrence on this determination in the resulting Biological Opinion.

5.5 Hazardous Materials Survey

There are no Hazardous Materials at this time in the analysis area.

5.6 Cultural Resources

No cultural sites have been identified. The analysis file contains the cultural report.

5.7 American Indian Rights

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

5.8 Environmental Justice

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

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

No mitigation measures were identified as part of this EA, a Finding of No Significant Impact (FONSI), nor any significant and adverse environmental effects of proposed Federal actions on minority populations, low income populations, and Native American tribes.

5.9 Invasive and Non-Native Species

Scotch broom, a noxious weed, occurs along the roads all throughout this watershed. In this project area, it occurs in small amounts. Timber harvest does disturb the soil, creating a seed bed. As this project is a thinning, the remaining canopy would provide enough shade to limit spread of broom into the harvest area. Other invasive species, such as Himalayan blackberry also grow along the roads, but shade would limit their spread into the project area. The design of the project uses Best Management Practices, which minimizes the spread of invasive species.

6.0 List of Agencies and Persons Consulted

This Environmental Analysis is being mailed out to the following members of the general public and organizations:

John Bianco
Oregon DEQ
Jim Goodpasture
Pam Hewitt
Charles & Reida Kimmel
Lane County Land Management
Carol Logan, Kalapooya Sacred Circle Alliance
Oregon Dept of Fish & Wildlife
Oregon Dept of Forestry
Oregon Natural Resources Council
The Pacific Rivers Council
John Poynter
Leroy Pruitt
Roseburg Forest Products
Peter Saraceno
Harold Schroeder
Sierra Club - Many Rivers Group
Swanson Superior Forest Products Inc.
Craig Tupper
Governor's Forest Planning Team
Jan Wroncy
Ann Mathews
American Lands Alliance
Kris and John Ward
Sondra Zemansky
Robert P Davison
Tom Stave, U of O Library
John Muir Project
James Johnston

A summary was sent to those receiving the "Eugene BLM Planning and Project Focus" Summer 1996 and Winter/Spring 1997 (approximately 250 mailings. A complete listing is available at the Eugene District Office).

Maps of the proposed harvest areas were sent to the Confederated Tribes of Grand Ronde and Confederated Tribes of Siletz, no comments were received.

7.0 List of Preparers

THE INTERDISCIPLINARY TEAM

Each member has reviewed this EA and concurs with its contents.

NAME	TITLE	RESOURCE/DISCIPLINE
Cheshire Mayrsohn	Botanist	Botany
Paula Larson	Wildlife Biologist	Wildlife Habitat
Kris Ward	Hydrologist	Water Resources
Rudy Wiedenbeck	Soil Scientist	Soils
Dave Reed	Fuels Mgt. Specialist	Fuels
Mike Southard	Archaeologist	Archaeology
Fred Kallien	Sivilculturist	Silviculture
Liz Aleman	Recreation Planner	Recreation
Mark D'Aversa	Soil Scientist	Fisheries
Mike Sabin	Forester	Engineering
Glen Gard	Haz/Mat Coordinator	Hazardous Materials
Dave DeMoss	Forester	Forestry
Jack Zwiesler	Forester	EA Writer/Team Lead
Trish Wilson	Landscape Planner	NEPA Coordination

The Finding of No Significant Impact (FONSI) is not a decision document. Its purpose is to state that the actions proposed do not have a significant effect on the environment and that an EIS is not needed according to information contained in the EA and other available information. The unsigned FONSI is sent out with the EA to let you know that we feel that our actions do not warrant an EIS.

Finding of No Significant Impact

CROOKED CREEK TIMBER SALE NO. E-01-205
EA OR 090-01-04

The Interdisciplinary Team for the McKenzie Resource Area, Eugene District, Bureau of Land Management has completed an Environmental Assessment (EA) and analyzed a proposal to harvest Federal forest in the Crooked Creek Timber Sale unit. Crooked Creek is located approximately 4 miles north of Marcola, Oregon in T. 15 S., R. 2 W., Sections 22 and 23 W.M. The proposal is a commercial thinning involving the removal of timber from the General Forest Management Area (Matrix) and density management within portions of the Riparian Reserves. Thinning of Riparian Reserves would be in compliance with the Standards and Guidelines of the Record of Decision (ROD) for the Forest Plan.

The proposed harvest would provide jobs and supply wood products. Cable logging systems and tractor logging systems would be used from existing roads and roads to be constructed. Approximately 0.6 mile of temporary road would be constructed and 0.3 mile decommissioned upon completion of harvest activities. All new roads would be blocked to 4-wheeled OHV traffic.

The design features of the Proposed Action are described in the attached Crooked Creek Environmental Assessment (OR 090-EA-01-04). The Proposed Action to harvest timber from Matrix and Riparian Reserves and an alternative to harvest timber from Matrix lands in the Eugene District are in conformance with the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl* (April 1994), the *Record of Decision for Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines,* February 2001, and the *Eugene District Record of Decision and Resource Management Plan* (June 1995).

The anticipated environmental effects contained in this EA are based on research, professional judgement, and experience of the Interdisciplinary (ID) team and Eugene District Resources staff. No significant adverse impacts are expected to (1) Threatened or Endangered species, (2) Flood plains or Wetlands/Riparian areas, (3) Wilderness Values, (4) Areas of Critical Environmental Concern, (5) Cultural Resources, (6) Prime or unique Farmland, (7) Wild and Scenic Rivers, (8) Air Quality, (9) Native American Religious Concerns, (10) Hazardous or Solid Waste, or (11) Water Quality.

DETERMINATION

On the basis of information contained in the EA, and all other information available to me, it is my determination that the Alternatives analyzed do not constitute a major Federal action affecting the quality of the human environment. Therefore, a new EIS or supplement to the existing EIS is unnecessary and will not be prepared.

Approved by:_____ Date:_____

Field Manager, McKenzie Resource Area

Appendix A

AQUATIC CONSERVATION OBJECTIVES

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

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

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

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

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

6. Maintain and restore in stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing (i.e., movement of woody debris through the aquatic system). The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.

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

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

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

Appendix B

PROJECT 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 analysis area.

1. **Riparian Reserves** - Interim Riparian Reserves would be established adjacent to all streams in accordance with the Northwest Forest Plan and RMP Standards and Guidelines. The reserves would provide habitat for Special Status and other species. There would be no landing or road construction in the Riparian Reserves. Timber harvest activities would be conducted in the upland portion of selected sections of the Riparian Reserves. The site potential tree height for the Mohawk Watershed Unit is 200 feet. A one site tree height (200 feet here) is considered the Riparian Reserve width on both sides of non-fish bearing streams and two site tree heights (or 400 feet) is established as the Reserve on both sides of fish bearing streams adjacent to the harvest areas. As stated previously, portions of the Riparian Reserve (the upland portion) would be treated via a density management treatment.

2. **Coarse Woody Debris Requirement** - All Class 2, 3 and 4 coarse woody debris (CWD) present within project units would be reserved on site. Recent windthrown Class 1 CWD would be salvaged and removed. CWD that presents a hazard to logging operations may be relocated within the project area.

3. **Snag Trees** - Existing snags in the harvest areas were found to be below the minimum RMP/ROD standards to meet the 40 percent primary cavity nesting birds criteria. Retain all existing snags that do not pose a safety hazard or operational obstacle. Snags felled as danger trees would be retained on site as down logs.

4. **Hardwoods And Minor Species** - Retain all Pacific Yew trees in the harvest areas. Hardwoods are to be retained in proportion to their occurrence.

5. Management activities would be altered according to RMP standards and guidelines if any cultural resources, Special Status Plants including Threatened and Endangered, Survey and Manage species, and Threatened and Endangered wildlife are found in or adjacent to the harvest areas.

6. Felling and Yarding Requirements - Directional felling and yarding would be utilized for the protection of retention trees, snags, and reserve areas.

7. Commercial thinning would be conducted using a cable logging system. One-end suspension of logs would be required wherever topography permits to reduce the extent of soil compaction. Ground based yarding operations can occur where slopes are less than 35 percent. Use of the following recommendations for ground based yarding systems would keep soil impacts within RMP standards:

    - Restrict yarding to seasonally dry periods when soil moisture levels are less than 25 percent

(usually between July 15 and Octber 15), as approved by the Authorized Officer in consultation with Area Soil Scientist.

- Preplan and designate all skid trails to occupy less than 10 percent of the harvest area. Require felling of trees to lead to the skid trails and maximize winching distances up to 100 feet and distances between trails up to 200 feet where feasible. Use existing skid roads wherever possible.

- Other methods of ground based harvesting, e.g., shovel logging, harvester processor, cut-to-length systems where there are restrictions to a single pass over the ground may be utilized with the approval of the Area Soil Scientist.

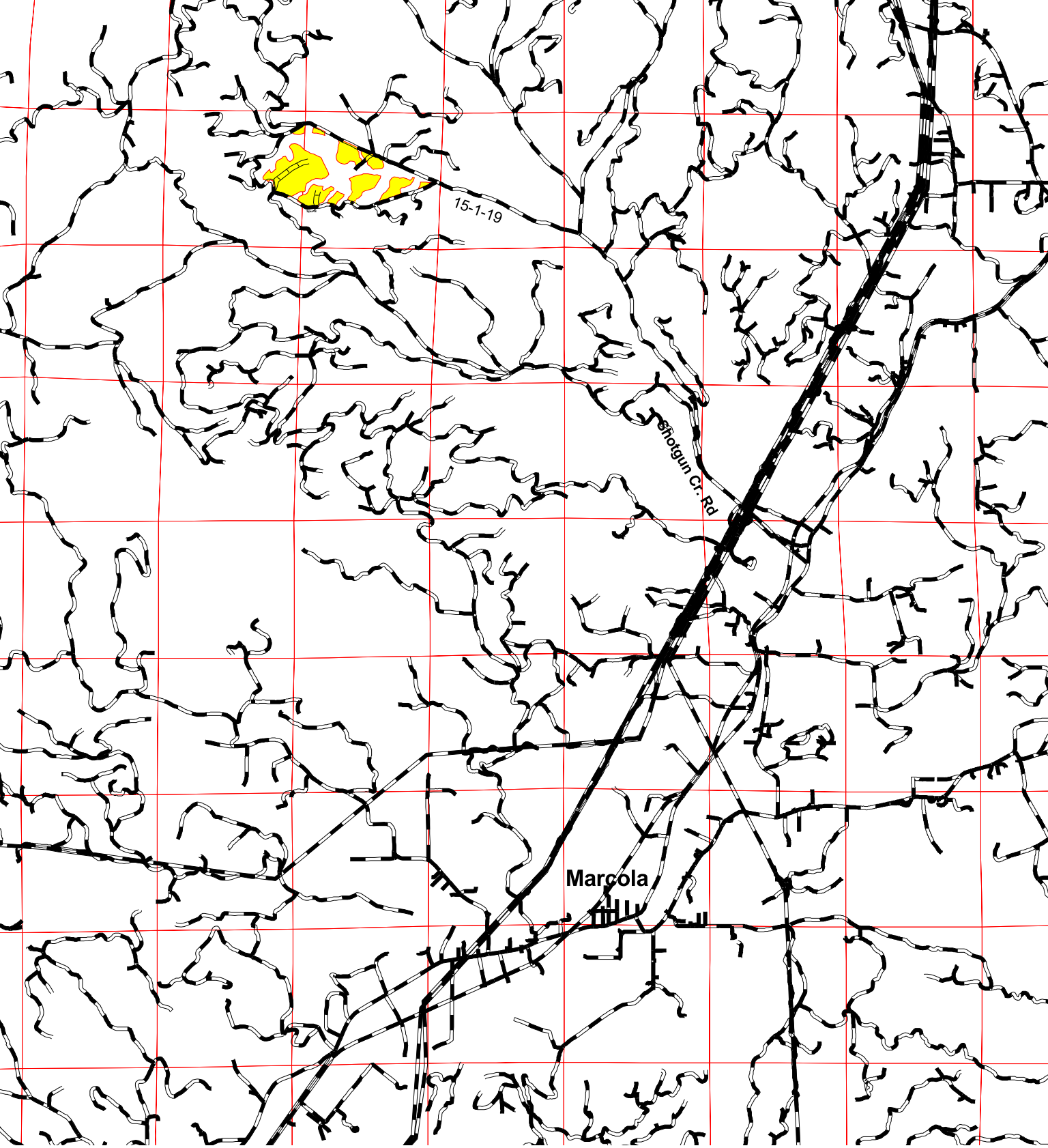
- Till all compacted skid trails and temporary native surface roads with a winged subsoiler during the same summer season as falling and yarding, when soil moisture conditions are 25 percent or less, or as approved by the Authorized Officer in consultation with the Area Soil Scientist.

8. For public safety reasons, roads would be signed to alert the public of the logging operations. The existing roads would be left clear of logging debris and equipment at the end of each day. New construction could be blocked during logging operations. Local OHV clubs would be notified of logging activities and local bike shops would be provided with announcements.

9. **Road Closures:** Remove all stream crossings and cross drain relief culverts. In channel work is to be conducted during low flow periods (July 15 to October 15) prior to fall rains. At stream crossings, recontour the channel side slopes and seed or plant exposed soils with native plant species for erosion control, as needed. If closed roads are not to be subsoiled, construct drainage dips, water bars, lead-off ditches, etc. to improve drainage to the surface and otherwise leave the road in an erosion resistant condition.

10. **Road Improvements:** Place cross drain relief culverts immediately upgrade of stream crossings where necessary to prevent cut slope ditch sediment from entering streams. Replace existing stream crossing culverts that are (1) failing or otherwise depositing excess sediment into streams or, (2) are undersized and located in an area with moderate to high potential for slope failures. Use the theoretical 100-year storm event as design criteria for permanent stream crossing culverts. In channel work is to be conducted during low flow periods (July 15 to October 15) prior to fall rains. Design adequate streambank protection (i.e., riprap) where scouring could occur. Silt fences or straw bales should be used to minimize sediment transport from the excavation area to down stream locations.

11. **Road Construction:** Road building would be limited to the dry season (generally between June 15 and October 15), as well as any harvest operations conducted from temporary native surface roads. Permanent roads would be surfaced with 8 inches of rock aggregate to reduce the potential for sediment delivery.

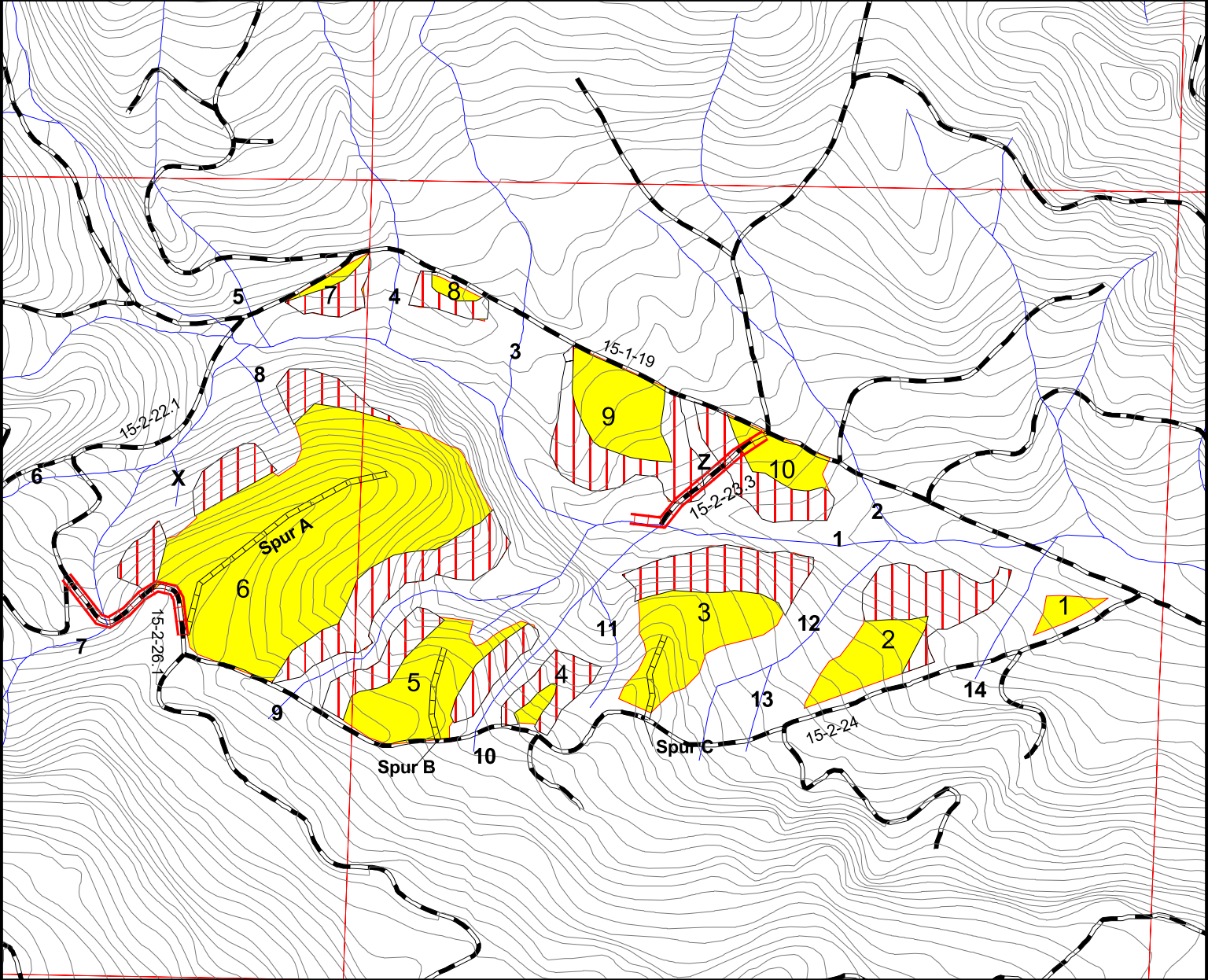


Spur
Roads
Sales01
Euge_pls

Vicinity Map
Proposed Crooked Creek Timber Sale
EA No. OR 090-EA-01-04

0.4 0 0.4 0.8 1.2 Miles

N



Area:
unit 1 - 1
2 - 12
3 - 18
4 - 4
5 - 16
6 - 62
7 - 3
8 - 2
9 - 15
10 - 9
ROW 3
total 145 acres

Fallfungi
Contour
Existing Road Decom.
Spur
Roads
Streams
Euge_pls
Riparian Thin
Sales01

2001 Harvest Area Map
Crooked Creek Proposed Action
Unit #1 through 10 - Thin

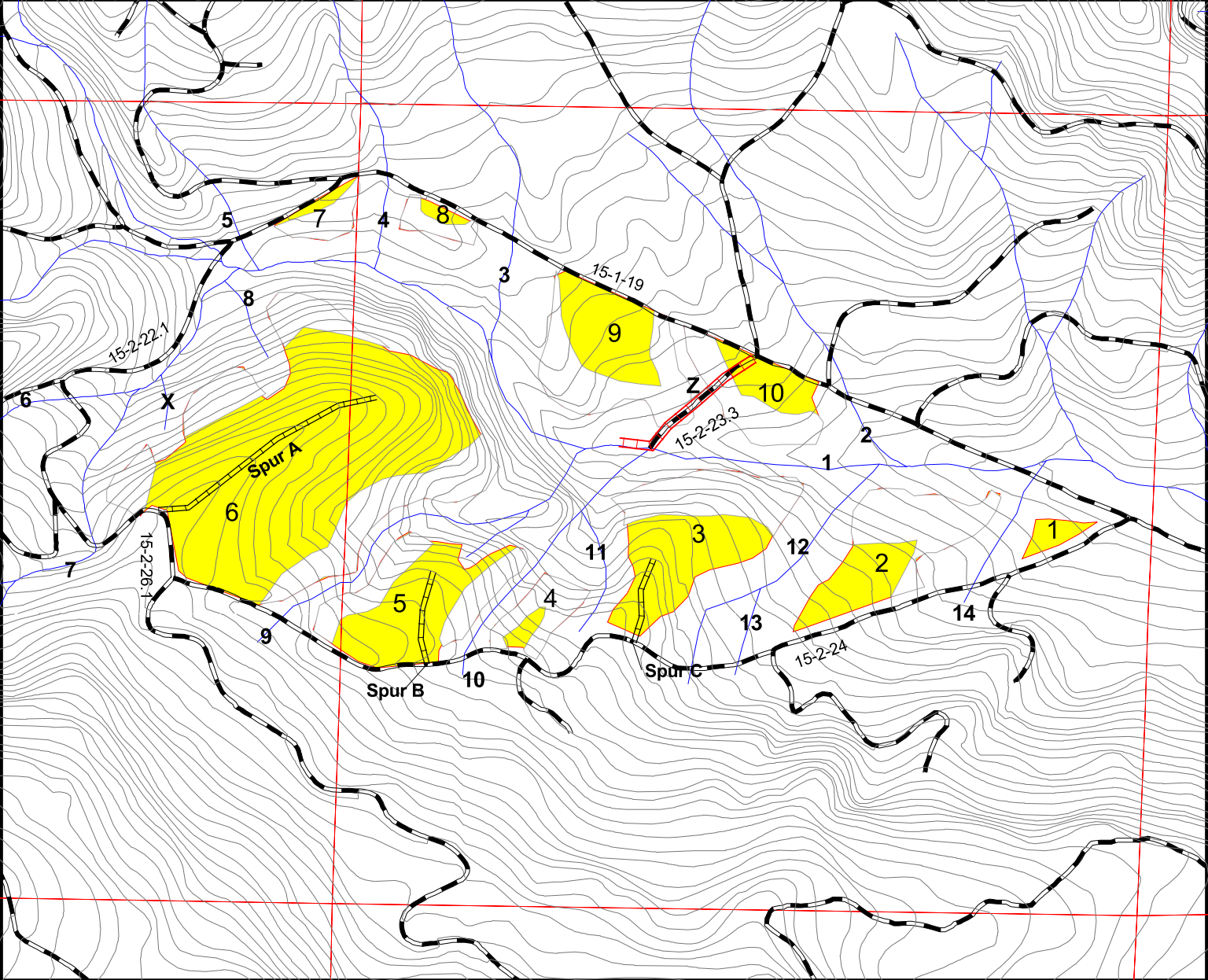
T.15S., R.02W. Sec 22/23

1000 0 1000 Feet

map scale 1"=1000'

N

1/05/2001



Area:
unit 1 - 1
2 - 5
3 - 10
4 - 1
5 - 10
6 - 49
7 - 1
8 - 1
9 - 8
10 - 4
ROW 3
total 93 acres

- Fallfungi
- Contour
- Spura3.shp
- Decoma3.shp
- Roads
- Streams
- Euge_pls
- Riparian not thinned
- Sales01

2001 Harvest Area Map
Crooked Creek Alternative III
Unit #1 through 10 - Thin

T.15S., R.02W. Sec 22/23

900 0 900 Feet

map scale 1"=1000'

N

11/17/2000