South River Commercial Thinning 2002 Environmental Assessment

South River Field Office
Roseburg District, Bureau of Land Management
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U.S. Department of the Interior, Bureau of Land Management
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Chapter 1
PURPOSE AND NEED

This chapter provides a description of the purpose and need for the action being proposed and analyzed in this environmental assessment (EA).

Background

Potential units for commercial thinning have been identified in the Upper Middle Fork Coquille River Watershed Analysis Unit in T. 29 S., R. 8 W., Section 29; T. 29 S., R. 9 W., Section 13; and T. 30 S., R. 9 W., Sections 13 and 23. Other units were identified in the Middle South Umpqua River/Rice Creek Watershed in T. 29 S., R. 6 W., Sections 27, 33 and 35; T. 29 S., R. 7 W., Sections 25 and 35 and the Lower Cow Creek Watershed in T. 30 S., R. 6 W., Sections 3 and 9. These stands evolved naturally following wildfires, or were reforested following previous timber harvest. The stands have received silvicultural treatments that may have included pre-commercial thinning, fertilization and/or hardwood eradication.

A summary of the management recommendations may be found in the Upper Middle Fork Coquille Watershed Analysis (USDI, BLM 1999a pp. 107-124), the Middle South Umpqua Watershed Analysis (USDI, BLM 1999b pp. 105-118), and the Lower Cow Creek Watershed Analysis (USDI, BLM 2000a p. 87) For the purpose of identification, proposed units were divided into three project areas based on proximity to one another, and logical access routes. The three project areas have been designated as Boomerang, Rice Bowl and Taylor Made. These names will provide a point of reference and basis for discussion in the chapters on Affected Environment and Environmental Consequences contained in this document.

Purpose

Inventories and stand exams formed the basis for identifying even-aged stands with high relative densities and diminishing crown ratios. Approximately 400 acres of General Forest Management Area (GFMA) are proposed for commercially thinning. Density management treatments are proposed for an estimated 120 acres of Riparian Reserves.

The objective would be reduction of relative stand densities in order to maintain stand vigor, consistent with stand and landscape objectives described in the Roseburg District *Record of Decision and Resource Management Plan* (USDI, BLM 1995a (ROD/RMP, pp. 150-1)). The ROD/RMP directs that commercial thinning in the GFMA should be carried out where practical and where increased gains in timber production are likely (ROD/RMP, p. 62). Stands suitable for thinning generally exhibit closed canopy, suppression mortality and reduced growth rates.

Density management within Riparian Reserves should be considered as a means of maintaining or restoring tree growth and vigor, reducing susceptibility to insect infestation, maintaining or enhancing current structural and vegetative diversity, and hastening the growth of larger trees in a shorter period of time that would provide shade and large wood for recruitment into streams.

Thinning in GFMA would yield an estimated 5.3 million board feet, equal to approximately 7,000 hundred cubic feet (CCF). This volume would contribute toward the Roseburg District's declared objective for an annual allowable sale quantity (ASQ) of 45 million board feet (ROD/RMP, p. 8). Volume derived from density management within Riparian Reserves would not be chargeable toward the annual ASQ.

This EA will provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement (EIS) or a finding of no significant impact (FONSI). It will consider the environmental consequences of the proposed action and no action alternatives, in the short and long term, on a site-specific level and at the fifth-field analytical watershed level. It will also evaluate the consistency of each alternative with the analysis of impacts contained in the Roseburg District *Proposed Resource Management Plan/Environmental Impact Statement* (USDI, BLM 1994 (PRMP/EIS)).

Need

Commercial thinning in GFMA stands is needed to reduce densities in order to maintain the health and vigor of the stands, and to provide a high level of quality wood and sustainable timber production.

Similar treatments in the associated Riparian Reserves are also needed, consistent with recommendations of watershed analysis and staff silviculturists. Density management would help achieve controlled stocking, establishment of desired non-conifer vegetation, and the desired vegetation characteristics needed to attain objectives of the Aquatic Conservation Strategy (ROD/RMP, pp. 153-154)

The sales are needed for attainment of the annual District ASQ, and in order to meet the socioeconomic objectives of the ROD/RMP and the PRMP/EIS. The PRMP/EIS (Vol. 1, p. xii) estimated that BLM management programs (including timber sales) would support 544 jobs and provide $9.333 million in personal income on an annual basis during the life of the plan. The management direction of the ROD/RMP is to "Plan and design forest management activities to produce a sustained yield of products to support local and regional economic activity. A diversity of forest products (timber and nontimber) will be offered to support large and small commercial operations and provide for personal use." (PRMP/EIS p. 2-41)

The sales are also needed to meet the requirements of the O&C Act which stipulates that suitable commercial forest lands revested by the government from the Oregon and California Railroad are to be managed for the sustained production of timber.

Implementation of the proposed action would conform to management direction contained in the ROD/RMP, as amended by the *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines in Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (USDA, USDI 2001 p. 3).

The ROD/RMP and PRMP/EIS incorporate the standards and guidelines of the *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* (USDA, USDI 1994a) and the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (USDA, USDI 1994b).

Chapter 2
DISCUSSION OF THE ALTERNATIVES

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

I. Alternative 1 - No Action

Under this alternative, no commercial thinning or density management would be carried out in the proposed areas. Current stand densities would continue to increase. Growth and development of the stands would continue along present trajectories, resulting in increased suppression mortality and potential stand stagnation. Other forest stands in the Matrix would be selected and analyzed for commercial thinning or regeneration harvest to meet ASQ and socioeconomic objectives of the ROD/RMP and PRMP/EIS, and requirements of the O&C Act.

II. Alternative 2 - Proposed Action

Commercial thinning or density management treatments would be applied to dense and even-aged stands dominated by Douglas-fir. The objective would be reduction of relative stand densities. Relative density compares the current density of a stand with the theoretical maximum density. In general terms it means that for a given average diameter, a stand can support a maximum number of trees per acre. Conversely, for a given number of trees per acre, there is a maximum average diameter possible. Relative density indicates whether the stand is growing well, is in need of thinning, can support an understory, or is experiencing mortality suppression.

GFMA stands would be thinned from below, removing primarily suppressed and intermediate trees, though removal of some co-dominant and dominant trees would be anticipated. Thinning would be designed to achieve a Relative Density Index (RDI) of approximately 0.35-0.45, to maximize growth of the remaining trees. On average, about 1/3 of the basal area in each unit would be removed. Where they are present, remnant older trees, and conifer and hardwood snags would be retained where they would not pose a safety risk, or otherwise interfere with access or operations. Marking would be based on an average spacing that would be generally consistent across most of the units. Trees selected for retention would have a live crown ratio of at least 30 percent so that release in response to thinning would be more likely. Average crown closure within the stands would be 60-70 percent, post-treatment.

The primary objective of density management in Riparian Reserves would be to accelerate the development of late-successional forest and habitat characteristics. These characteristics would include larger diameter trees, large down wood, hardwood tree species, a mosaic of treated and untreated areas, and small gaps or openings that would allow for the establishment and development of additional canopy layers. This would be accomplished by reducing the RDI to between 0.25 and 0.30.

Variable width "no-harvest" buffers would be established on all perennial and intermittent streams, a minimum of 20-feet in width, with actual widths varying according to adjacent topography, vegetation and the degree of solar radiation to which streams could be subjected. Trees designated for felling adjacent to these "no-harvest" buffers would be directionally felled away from the buffers to help maintain buffer integrity.

Outside of the "no-harvest" buffers, density management in the Riparian Reserves would be based on variable spacing that would retain trees across a range of heights and diameter classes. Where consistent with other resource objectives, wider spacing would be prescribed to foster rapid growth of individual trees. This would also create small openings which would allow for establishment of a vigorous growth of trees and shrubs in the understory. Untreated areas would be established around key habitat features identified by the interdisciplinary team.

The selection of leave trees in the Riparian Reserves would not be based solely on retaining the healthiest and best-formed trees. Some of the retained trees would exhibit defects such as crooks, brooms and broken tops. Minor conifer species such as cedars would be favored for retention. Douglas-fir would be favored over grand fir. Ponderosa pine planted in the 1960s from off-site seed sources would be removed wherever practical. Hardwood trees greater than 10 inches in Diameter at Breast Height (DBH) would be selected for retention in both the GFMA and Riparian Reserves, where they are likely to survive thinning operations and not compromise treatment objectives.

All existing large down wood in Decay Classes 3, 4 and 5 would be reserved under contract stipulations. Should a post-treatment evaluation conclude that a need exists for additional down wood or large wood in streams, larger trees from among those reserved would be felled to fill the short-term deficit.

Timber cruising would be accomplished using techniques that could include the felling of sample trees in GFMA stands. If determined to be necessary, trees would be felled for the formulation of local taper and volume tables, and become a part of the offered sale volume. Selection and felling of sample trees would be conducted consistent with the assumptions and provisions described in the Roseburg District *3P Fall, Buck and Scale Sampling Environmental Assessment* (USDI, BLM 2000b).

Cable yarding equipment would be required to have the capability of maintaining a minimum of one-end log suspension in order to reduce soil disturbance. At least 100 feet of lateral yarding capacity would also be required so that yarding corridors would be spaced at intervals of at least 200 feet, whenever practicable. The intent is to reduce the number of reserved trees that would require cutting to clear yarding roads and landing areas.

Ground-based harvest would be restricted to the period between May 15th and the onset of regular fall rains, usually around mid-October. Main skid trails, those in which 50 percent or more of the trail is exposed to mineral soil, and landings would cumulatively affect less than 10 percent of the yarded area. Existing skid trails would be used to the degree practical and count toward the 10 percent affected area, when combined with new trails and landings. Landings

would be tilled upon completion of operations. Selective tilling of haul roads and skid trails would also be done if recommended by silviculture and soils staff. Main skid trails not designated for treatment at intermediate entry would be mapped and documented for treatment at the time of final regeneration harvest.

Additional operational restrictions may also apply during the bark slip period, from April 15th to July 15th. The bark slip period is the portion of the year when active cambial growth results in bark being less firmly attached to the boles of trees and more susceptible to mechanical damage, particularly in younger trees. Timber felling and yarding in association with right-of-way clearing would be allowed. Timber felling and yarding within units would generally be subject to this restriction. Circumstances may exist, however, where it would be practical to waive this restriction, such as in the use of harvesters and forwarders that are capable of severing trees and setting them aside without damaging adjoining trees.

Tables 1-3 summarize the three proposed commercial thinnings by unit, acreage, anticipated harvest method and anticipated seasonal restrictions on operations. Where units are identified as being available for harvest in any season, and also subject to dry weather restrictions, this reflects the probability that both ground-based and cable harvest systems would be employed.

Table 1 –Boomerang Commercial Thinning

Unit	Approximate Acres	Yarding Method				Season of Operation	
		ground-based	%	cable	%	dry	any
A	24			X	100	X	
B	4	X	100			X	
C	30	X	65	X	35		X
D	13	X	65	X	35	X	X
E	5	X	100			X	
F	23			X	100	X	
H	17			X	100	X	
I	7			X	100		X
J	8	X	35	X	65	X	X
K	28			X	100	X	X

Table 2 –Rice Bowl Commercial Thinning

Unit	Approximate Acres	Yarding Method				Season of Operation	
		ground-based	%	cable	%	dry	any
A	62	X	30	X	70	X	X
B	112	X	15	X	85	X	X

Table 3 - Taylor Made Commercial Thinning

Unit	Approximate Acres	Yarding Method				Season of Operation	
		ground-based	%	cable	%	dry	any
A	26	X	50	X	50	X	X
B	21	X	25	X	75	X	X
C	13			X	100	X	
D	25	X	85	X	15	X	
E	3	X	100			X	
F	14	X	100			X	
G	13	X	100			X	
H	5	X	100			X	
I	59	X	85	X	15	X	X
J	10			X	100		X

Existing system and non-system roads (i.e., jeep roads, skid roads) would provide primary access to thinning units. These roads would be supplemented by the construction of permanent and temporary roads where needed. Temporary roads would be planned for construction, used and decommissioning in the same operating season. If temporary roads could not be utilized in that time frame, such as in times of fire closure, the BLM would winterize these roads, at its discretion, and allow their use the following year. A second option would be to authorize surfacing to accommodate winter operations if no other conflicting resource concerns were present. In either case, the intent would be to decommission temporary roads after use. Renovated roads that are not surfaced would be treated in a similar fashion, subject to one additional provision. If the roads could not be decommissioned because of access rights held by private parties under easement or reciprocal rights-of-way, the roads would be blocked to prevent vehicular use during winter months and reopened in the future if needed.

Table 4 summarizes the road work proposed in association with the projects. The figures are approximate. Actual decommissioning would be subject to the agreement of individuals and/or corporations holding easements or reciprocal rights-of-way agreements as noted.

Table 4 – Summary of Proposed Road Work

Project Name	Proposed Road Work / Treatments (miles)					
	Construct / Decommission	Renovate / Decommission	Decommission / Without Using	Renovate / Surface	Construct / Permanent	Totals
Boomerang	0.50	0.70	0.00	0.40	0.10	1.70
Rice Bowl	0.00	0.15	0.33	1.07	0.21	1.76
Taylor Made	0.25	0.08	0.65	1.20	0.05	2.23
Totals	**0.75**	**0.93**	**0.98**	**2.67**	**0.36**	**5.69**

Maps of proposed unit configurations and access, contained in Appendix A provide additional information as to the location of specific roads.

Units D, E, F, G and H of the Taylor Made proposal are located within the Camas Valley Rural Fire District and the Wildland-Urban Interface. The area has been identified as a high fire-risk area. In order to address the risk, within those portions of the units allocated as GFMA, all trees greater than 5 inches DBH and not reserved from cutting would be felled. Logging slash would be pulled back a minimum of 20 feet from Douglas County Highway 131S, and scattered within the units.

III. Considered But Eliminated From Detailed Analysis

A. Units Dropped from Consideration

Unit G in the Boomerang thinning project was dropped from further consideration because it is dissected by a large number of streams. The establishement of Riparian Reserves and “no-harvest” buffers would make access, designation of landing areas, and conventional yarding extremely difficult.

B. Retention On-Site Of All Trees Cut In Riparian Reserves

Retention on site of all cut trees within Riparian Reserves was considered. It was concluded that it was not viable because of the following risks posed.

Insect Risk

Research indicates that the risk of Douglas-fir beetle infestation increases when three or more trees per acre greater than 12 inches DBH are killed in a single year, though beetles have also been found to utilize trees as small as 8 inches DBH. Felled or girdled trees in full or partial shade would provide prime brood habitat for beetles. Newly hatched generations could then infest and damage, or kill other trees in treated or adjoining stands (Goheen 1996).

Beetles outbreaks generally persist for four years, during which time beetles typically attack the larger trees in a stand. In an outbreak it may be expected that, on average, four live trees would be attacked and killed for every 10 felled or girdled trees. If beetle populations are large, all trees may be killed in pockets up to 2 acres in size. Douglas-fir beetles are strong fliers and 10-20 percent of the time will migrate and infest other stands at distances of 5 miles or more from where they hatched (Goheen 2001). This would pose an unacceptable risk to other forest stands managed by Federal agencies, private timber companies, and individual property owners.

Fire Risk

If all of the trees felled within the Riparian Reserves trees were retained on-site, fuel loading would be increased by 15 tons/acre or more. It would be expected that approximately 75 percent of this material would be fine fuels, less than 3 inches in diameter. Fine fuels represent ignition potential and the means by which larger fuels are ignited. Fine fuels also have the greatest influence on the rate of fire spread. The risk of ignition posed by these fuels would persist 1-3 years after the completion of individual thinning treatments.

The remainder of the fuels would be characterized as large fuels, greater than 3 inches in diameter. These fuels are primarily responsible for fire intensity and duration, and pose the greatest fire control problems. The increased risk for high fire intensity would persist for 15-20 years until the material decays sufficiently. By themselves, large fuels do not pose a high risk but when combined with large amounts of fine fuels they create the risk of a fire sufficiently severe to result in stand replacement. This would be inconsistent with management objectives for limiting the size of all wildfires and maintaining long-term ecosystem function within the Riparian Reserves (ROD/RMP, p. 27).

As already noted above, several units from the Taylor Made proposal are located within the Camas Valley Rural Fire District and the Wildland-Urban Interface. Creation of fuel conditions that would further increase the risk of catastrophic fire would be inconsistent with current National policy, and contrary to the objective of reducing the risks to private property and natural resources in the rural-urban interface.

C. Retention of a Portion of the Trees Cut in the Riparian Reserves

Comments have been received on previous analyses that proposed density management in Riparian Reserves. The suggestion was made that some trees selected for cutting should be girdled or felled and retained on-site. The opinion was expressed that this was necessary to provide snags and down wood, and that the removal of all of the cut material that would otherwise create deficiencies in these habitat components.

In developing the marking prescription for Riparian Reserves, no additional measures were deemed necessary to recruit additional down wood and snags. As discussed previously (p. 5), the reservation of all existing Decay Class 3, 4 and 5 down wood would be stipulated under contract provisions, and existing snags reserved wherever practicable. The selection of trees for retention would include trees with broken tops or displaying other defect that would provide future nesting structure.

It would also be expected that mechanical damage during thinning operations would create down wood and snags. Natural processes such as wind throw and wind break, snow break, insect damage, disease and suppression mortality would also create snags and down wood over the course of normal stand maturation. If a post-treatment assessment of identified deficiencies in these habitat components, sufficient larger trees would remain so that some could be felled or girdled to create additional snags and down wood.

IV. Resources That Would Remain Unaffected by Either Alternative

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

No measurable effect on the introduction of noxious weeds or the spread of established infestations would be anticipated, as discussed in Chapter 3 of this document.

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

Chapter 3
AFFECTED ENVIRONMENT

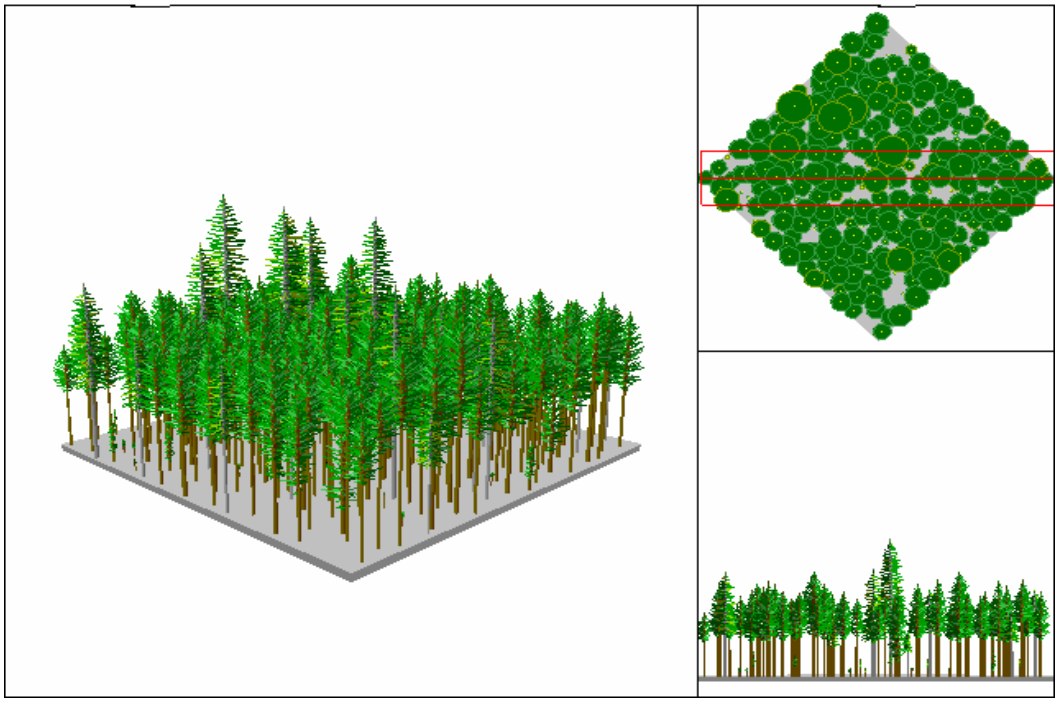
This chapter summarizes the specific resources present or potentially present within the area, and that could be affected by the proposed action.

I. Timber/Vegetation

A. *General Forest Management Areas*

Douglas-fir and grand fir are the dominant tree species with incense-cedar, western redcedar, ponderosa pine, and sugar pine present as lesser components. Average crown closure ranges from 80-to-100 percent. Hardwoods include Pacific madrone, golden chinquapin, big-leaf maple, red alder, and willow. Vine maple, manzanita, huckleberry, ocean spray, and hazel are the most common shrub species, with herbaceous growth that includes Oregon-grape, salal, and sword fern as the primary species.

Figure 1 - Current Stand Condition. *The following display is representative of current of GFMA stands proposed for thinning. SW Organon version 6.0 was used to model existing stand conditions, and Stand Visualization System version 3.8 (SVS) was used to display the results.*



Tables 5-7 summarize the stand conditions within the three project areas. These were generated from stand exam plot data using SW ORGANON growth models. They are intended to represent expected average conditions and may not entirely reflect individual site conditions across and between stands.

Table 5 - Boomerang Commercial Thinning

Unit	Current Stand Age	Trees per Acre	% Crown Closure	Quadratic Mean Diameter (inches)	Basal Area in Sq. Ft.	RDI
A	38	183	88	14.2	149	0.497
B & C	41	150	89	14.2	165	0.497
D	39	169	90	13.1	159	0.493
E & H	40	262	100	12.1	208	0.667
F	42	248	94	11.8	189	0.610
I	39	231	99	12.2	186	0.595
J	39	244	95	11.7	183	0.594
K	39	231	99	12.2	186	0.595

Table 6 - Rice Bowl Commercial Thinning

Unit	Current Stand Age	Trees per Acre	% Crown Closure	Quadratic Mean Diameter (inches)	Basal Area (ft^2)	RDI
A	61	233	93	11.8	177	0.573
B	61	289	89	11.5	210	0.575

Table 7 - Taylor Made Commercial Thinning

Unit	Current Stand Age	Trees per Acre	% Crown Closure	Quadratic Mean Diameter (inches)	Basal Area (ft^2)	RDI
A	43	197	90	12.5	167	0.530
B	35	347	83	9.8	180	0.629
C	81	324	100	11.7	243	0.791
D, E, F, G, H	39	222	90	8.0	160	0.525
I	43	206	70	11.7	154	0.501
J	39	248	95	12.0	194	0.610

B. *Riparian Reserves*

The condition of the Riparian Reserves within the proposed thinning units is comparable to those of the adjacent GFMA stands. High stand density and crown closure are resulting in suppression mortality in smaller trees, recession of individual tree crowns, and a general decline in growth rates and tree vigor.

C. *Port-Orford-cedar and Port-Orford-cedar Root Disease*

Port-Orford-cedar does not occur naturally in the Middle South Umpqua River/Rice Creek watershed, but is present to the south in the Lower Cow Creek watershed. Off-site Port-Orford-cedar was planted in previously harvested units adjacent to proposed Units D, E, F, H and I of the Boomerang project, and along portions of the haul route.

The Taylor Made proposal is located in the Upper Middle Fork Coquille watershed analysis unit. There are 67,207 acres in the watershed analysis. The BLM manages 25,960 acres, or 39 percent of the total area. Port-Orford-cedar is native to the area, and occurs as individual or scattered groups of trees, rather than as continuous stands. A comprehensive inventory of the location of Port-Orford-cedar on privately managed forest lands does not exist.

In order to determine the extent of Port-Orford-cedar on BLM-managed lands, roadside surveys were conducted in 1996. If Port-Orford-cedar was observed along a road, it was assumed to be present within the entire corresponding forest operations inventory unit, unless more extensive surveys indicated otherwise. Port-Orford-cedar was estimated to occupy 6,163 acres, or roughly 24 percent of the BLM-managed lands in the Upper Middle Fork Coquille watershed analysis unit. Infected and healthy Port-Orford-cedar trees are present in the Taylor Made project area along the proposed haul route, in a draw between proposed Units B and C, and in Unit D.

Port-Orford-cedar can be infected by the pathogen *Phytophthora lateralis* (*P. lateralis*). This water mold causes a root disease in which mycelia grow in the cambial tissues of the tree roots. The mycelia may eventually colonize the entire root system of the host tree, where they block the uptake of water and nutrients and result in eventual death of the infected tree. Mature trees may succumb in two to four years, and seedlings in a few weeks.

P. lateralis is spread by the transport of infested soil and overland flow of water, primarily in the autumn, winter, and spring when cool and moist conditions are the most favorable. Resting spores may lie dormant during dry periods, and remain viable in infected root systems for 7 years or more following the death of the host tree (Hansen and Hamm 1996).

Vehicular traffic, primarily the use of dirt roads during prolonged periods of wet weather, and activities related to road construction, road maintenance and logging can spread the disease by transporting infested soil into disease-free areas. One study (Jules, et al. in press) concluded that 72 percent of infected sites in the landscape under examination were the result of vehicular dispersal of contaminated soil along roads. Wildlife and casual forest visitors are additional means by which infested soil may be transported.

High-risk areas include stream courses, drainages, low-lying areas down slope from infected sites, or areas below roads and trails where inoculum may be introduced. There is no definitive distance along roads or streams considered to be at high risk, but Port-Orford-cedar is not usually infected more than 40 feet down slope from roads except where streams, culverts, and wet areas are present to facilitate spore dispersal. (Goheen, et al. 1986) Spread of the disease upslope depends on slope steepness and the location of tree roots in relation to the road or ditchline.

Infested areas were initially identified using 1994 aerial photographs for the Roseburg District portion of the Middle Fork Coquille watershed, supplemented by on-the-ground verification. The subsequent spread of the disease was assessed using 1997 Coos Bay District aerial photographs and 1999 Roseburg District aerial photographs.

Within the entire watershed, it is estimated that 163 acres are infected. On BLM-managed lands in the watershed, an estimated 79 acres are infected, representing slightly more than one percent of the area in which Port-Orford-cedar is present. In contrast, the Draft Port-Orford-cedar Rangewide Assessment estimates that the infection is present in 8 percent of the entire range of Port-Orford-cedar. The average size of infected areas in the Upper Middle Fork Coquille watershed analysis unit is one acre, with the largest being 12 acres.

II. Wildlife

A. *Special Status Species*

Special status species are: listed as threatened or endangered under the Endangered Species Act of 1973, as amended; candidates or proposed for listing under the Act; or designated as Bureau Sensitive or Bureau Assessment species. Bureau Sensitive species are eligible for Federal or state listing, or candidate status under BLM 6840 policy. Bureau Assessment species are designated under Oregon/Washington BLM 6840 policy. They are not presently eligible for listing or candidate status, but are of State concern and may require protection or mitigation in the application of BLM management activities.

1. Threatened and Endangered

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

Annual surveys by the Oregon Cooperative Wildlife Research Unit have not located any nesting bald eagles within the South River Resource Area. None of the proposed units are near large rivers or bodies of water, or contain trees of suitable size for nesting or roosting. The bald eagle would not be expected in the project areas, and would not be affected by the proposed thinnings. As a consequence, no further discussion of the eagle is necessary in this analysis.

The project areas are outside the historic range of the Douglas County population of Columbian white-tailed deer. As a consequence, the species is not expected, no impacts would be anticipated, and no further discussion is necessary in this analysis.

Northern Spotted Owl

Provincial home ranges for northern spotted owls overlap portions of the project areas. The Rice Bowl project area is overlapped by two occupied home ranges, and abuts two others. In the Taylor Made project area, three home ranges overlap Unit A, and a single home range overlaps Units B and C. None of these units are within ¼-mile of any owl activity centers, however.

Suitable nesting, roosting and foraging habitat is generally characterized by mature forest stands containing large conifer trees with broken and unbroken limbs of large diameter, bole or crown deformities, and large broken tops or cavities which would provide nesting sites (Forsman 1984; Hershey 1995; Forsman and Giese 1997). Wild forest stands greater than 120-years-old are representative of Suitable Habitat 1, on the Roseburg District.

Suitable Habitat 2 is characterized by forest stands 80-120-years-old. These stands provide for foraging and roosting, but have little or no nesting structure

As illustrated by Tables 5-7 (p. 12), the age of stands proposed for thinning is generally 40-to-45-years-old with the exception of the units in the Rice Bowl project and Unit C of the Taylor Made project. The stands lack the larger trees that provide nesting opportunities. Theses stands have closed canopies and provide for foraging and dispersal. The level of use for foraging may vary in accordance with abundance of prey, proximity to activity centers and percentage of Suitable Habitat 1 and 2 within the home range.

Marbled Murrelet

All of the proposed Taylor Made project area is located within the 35-50 mile marbled murrelet management zone. The other project areas are not.

Suitable nesting structure for the murrelet is similar to that used by the northern spotted owl, consisting of mature to old-growth trees with large limbs, deformities, mistletoe brooms and abandoned animal nests that provide nesting platforms. (Evans et al. 2000.) By contrast, though, these large trees may be components of a mature stand, or remnant overstory trees in younger stands.

Following evaluation, only proposed Units D and J of Taylor Made were determined to be potential habitat. In addition to the 35 acres comprising the two units, an additional 9 acres of contiguous habitat was identified.

2. Proposed or Candidate

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

3. Bureau Sensitive

The only Bureau Sensitive species reasonably expected in the project areas is the Oregon Megomphix snail (*Megomphix hemphilli*).

The Oregon Megomphix snail has been located in forest stands throughout the South River Resource Area, where it appears to favor a habitat with hardwoods and hardwood litter. This species was also designated as a Special Attention, also referred to as Survey and Manage, species in the ROD for the Northwest Forest Plan. The amended Standards and Guidelines for Survey and Manage (USDA, USDI 2001 p. 49) do not require pre-disturbance surveys for the species, but direct that sites located prior to September 30, 1999, be managed for persistence of the species on those sites. No sites have been previously identified, no management action is required, and no further discussion of the species is necessary in this analysis.

B. <u>*SEIS Special Attention Species*</u>

Special Attention species are species designated for protection under Survey and Manage and/or Protection Buffer standards and guidelines in the Northwest Forest Plan as amended by the *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines in Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl*, and incorporated into the Roseburg District ROD/RMP.

There are six vertebrate and invertebrate species that might be expected in the Resource Area. As noted, surveys for the Oregon Megomphix snail are no longer required. Survey requirements for the Bureau Sensitive Del Norte salamander (*Plethodon elongatus*) were also dropped.

The project area is outside of the accepted range of the Crater Lake tightcoil snail (*Pristoloma arcticum crateris*). Based upon additional data considered in the 2001 Annual Species Review, the requirements for pre-disturbance surveys for red tree voles (*Arborimus longicaudus*) were modified. Within the central portion of the vole's distribution range, an area that includes the Roseburg District, pre-disturbance surveys are no longer required.

Great gray owls (*Strix nebulosa*) may be found in forest types that include ponderosa pine, Douglas-fir and grand fir, among others. Current protocols require pre-disturbance surveys if the project area is located above 3,000 feet in elevation and within 1,000 feet of natural meadows larger than 10-acres in size. These habitat components are not present in the project areas, so pre-disturbance surveys are not required and the great gray owl will not be discussed further in this analysis.

The Oregon shoulderband snail (*Helminthoglypta hertleini*) inhabits rocky areas and talus deposits, and areas with permanent ground cover and moisture in conjunction with rock fissures or large woody debris. Occupied sites have been identified in the South River Resource Area in the Canyon Creek and Dickerson Rocks areas.

III. Vascular and Non-Vascular Plants

The criteria for designating plants as Special Status Species are identical to those described above, for wildlife. Based upon available habitat, the following species might be expected to occur in the project areas and would be surveyed for.

A. *Special Status Vascular Plants*

Aster vialis
Bensoniella oregona
Cimicifuga elata
Cypripedium fasciculatum
Cypripedium montanum
Iliamna latibracteata
Lupinus sulphureus var. kincaidii

Kincaids's lupine (*Lupinus sulphureus* ssp. *Kincaidii*) is a federally-threatened species with the potential to inhabit portions of the project areas. The U.S. Fish and Wildlife Service has identified potential suitable habitat, based upon geographic location and an array of soil types. Based upon this information, the Rice Bowl and Taylor Made projects are not located in or adjacent to potential suitable habitat. Units B, C, E and J of the Boomerang project are located in an area that is described as potential suitable habitat and would require surveys to determine the presence of the species.

B. *SEIS Special Attention Species*

Based upon existing habitat conditions, the following species may be present in the project areas and would be surveyed for.

Lichens
Hypogymnia duplicata
Lobaria linita
Pseudocyphellaria rainierensis

Bryophytes
Schistostega pennata
Tetraphis geniculata

IV. Fish and Essential Fish Habitat

A. *Aquatic Habitat Conditions*

Aquatic habitat surveys by the Oregon Department of Fish and Wildlife, and observations by BLM fisheries biologists form the basis for describing the present condition of aquatic habitat at the 5th-field watershed levels, though they do not necessarily reflect conditions in the individual drainages in which thinning is proposed.

Within the Upper Middle Fork Coquille watershed analysis unit, the following conditions were observed in surveys conducted in 2000. For the subject streams, Bridge Creek and an unnamed tributary of Twelvemile Creek, overall habitat condition was assessed as good.

- Habitat access evaluates the presence of physical barriers that restrict or eliminate access by fish to historically available habitat available. Habitat access is considered poor for resident fish passage.

- The condition of substrate (spawning gravel) was assessed as fair to good, though sediment from agricultural activities, timber harvest, and forest roads is considered a problem.

- Pools provide rearing habitat for anadromous fish fry and year-round habitat for resident fish. Pool frequency and quality were evaluated as fair to good. Conditions affecting the quality of pools may include size and depth, sediment, cover and the availability of large wood.

- Large woody debris, in the form of trees and logs, provides cover and reduces stream velocities. It also promotes channel meander, collects and holds substrates, and provides a long-term source of organic material and nutrients. Large wood in streams within proposed units is primarily logging slash in an advanced stage of decay. As a consequence its overall condition is considered poor. Past timber management practices on Federal lands included stream cleaning. Historic harvest on private lands cleared along streams to enlarge pastures and fields, and salvaged deadfall from streams.

- Off-channel habitat and refugia are considered to be in generally good condition. These areas adjacent to streams and wetlands provide a reservoir of water to maintain stream flows and water temperatures during periods of low flows, and provide habitat for a variety of terrestrial and aquatic wildlife. The amount of streamside shade that moderates water temperatures during the summer months was assessed as good to excellent.

A set of four stream surveys (Rice Creek, Lane Creek, Judd Creek and the W. Fork of Willis Creek) was used to describe the baseline conditions in the proximity of proposed thinning units in the Middle South Umpqua River/Rice Creek watershed. The overall rating was fair.

- Habitat access would be considered poor. On the lower reach of Rice Creek, poorly installed stream-crossing culverts impede passage of adult fish during low flows, and likely restrict the upstream and downstream migration of juvenile resident trout.

- Sediment conditions were considered fair in the W. Fork of Willis Creek and in Judd Creek, but good to excellent in Lane Creek and Rice Creek.

- Stream pool conditions were assessed as fair to poor, with the exception of the W. Fork of Willis Creek, which was considered excellent.

- The condition and availability of large in-stream wood was assessed as poor across all of the surveyed streams.

- Off-channel conditions and stream shade were considered good for all but Rice Creek. The lowest reaches of Rice Creek are bordered by road and pasture, and as a consequence, few trees exist to provide shade.

B. *Threatened and Endangered Species*

The Umpqua River cutthroat trout (*Oncorhynchus clarki clarki*) was previously listed as endangered by the National Marine Fisheries Service. The listing was withdrawn on April 19, 2000, with concurrence from the U.S. Fish and Wildlife Service (Federal Register 2000a Vol. 65/No.81), based on the determination that the Umpqua cutthroat was not a unique Evolutionary Significant Unit (ESU), but a part of the larger Oregon Coast cutthroat trout ESU.

The Oregon Coastal cutthroat trout has subsequently been listed as a candidate, and jurisdiction on final listing and consultation transferred to the U.S. Fish and Wildlife Service (Federal Register 2000b Vol. 65/No.78). Candidate status is still under review by the U.S. Fish and Wildlife Service.

In 1998, the National Marine Fisheries Service proposed the Oregon Coast steelhead (*Oncorhynchus mykiss*) as a candidate for threatened species designation (Federal Register 1998a Vol. 63/No. 53). To date, there has been no change in its status. The National Marine Fisheries Service also designated the Oregon Coast coho salmon (*Oncorhynchus kisutch*) ESU as a threatened species (Federal Register 1998b Vol. 63/No. 153).

There are no coho salmon within 2 miles of any units comprising the Taylor Made proposal, because of natural barriers described below. Steelhead trout may be present within a half mile of some units, though. Resident fish have been noted immediately adjacent to some units.

The Oregon Department of Fish and Wildlife has documented spawning by coho salmon and winter steelhead trout in Rice Creek, immediately adjacent and downslope from Unit A of the Rice Bowl proposal. No resident or anadromous habitat exists within or adjacent to Unit B.

Resident and anadromous fish are present within 200 feet of Unit A of the Rice Bowl proposal and in a stream adjacent to and directly downslope of Unit C of the Boomerang proposal. No fish-bearing streams are adjacent to any other proposed units. Resident fish are present 0.2-1.5 miles, and anadromous species from 0.2-2.3 miles downstream of all other proposed units.

C. *Essential Fish Habitat*

Essential Fish Habitat (EFH) is designated for fish species of commercial importance by the Magnuson-Stevens Fishery Conservation and Management Act of 1996. On the Roseburg District this is habitat that is currently or was historically available to Oregon Coast coho or chinook salmon (Federal Register 2002 Vol. 67/ No. 12).

There is no Essential Fish Habitat in the vicinity of any proposed units in the Taylor Made project area because of long-standing natural barriers to fish passage. The first barrier is Bradford Falls, on the Middle Fork Coquille River, approximately 2.5 miles inside the watershed boundary. Some accounts have steelhead trout passing this barrier during periods of high flow, but further migration up the Middle Fork Coquille is blocked by a second barrier 1.5 miles upstream from the confluence of Twelvemile Creek with the Middle Fork Coquille River.

Essential Fish Habitat is located immediately below Unit A and approximately 0.6 miles downstream of Unit B in the Rice Bowl project area. Essential Fish Habitat in the Boomerang project area reflects the limits of anadromous fish distribution.

V. Water Quality/Resources

The watersheds in which thinning is proposed are located within the Southern Oregon Coastal Basin. This area has a Mediterranean type of climate characterized by cool, wet winters and warm, dry summers. The majority of precipitation falls as rain, however, some snow may fall at higher elevations. Stream flows closely parallel the precipitation pattern, with peak flows occurring from November to March and low flows from July to October. Low base flows in the summer months result in small 1st and 2nd order headwater streams going dry in most years.

Peak Flows and Annual Yield

Peak flows may be increased as a result of warm, rain on snow events in the Transient Snow Zone (Harr and Coffin 1992), generally described in this geographic area as the lands situated between 2000 and 5000 feet in elevation. The only proposed units in the Transient Snow Zone are those of the Boomerang project, and the southern edge of Unit B of the Rice Bowl project.

Roads have also been associated with potential increases in peak flows (Beschta 1978, Wemple et al. 1996). Mid-slope roads may intercept subsurface water and divert it into the road drainage system, effectively extending the drainage network and concentrating run-off before it is delivered to streams. Inadequate road drainage may create the same result. Several road segments proposed for use in the thinning projects are poorly drained.

While not conclusive, increases in peak flows of approximately 10 percent have been observed when road density approaches 3-4 percent of the area in a basin (Watershed Professionals Network 1999 p. IV-15). While drainages are not comparable in scale, roads in the project drainages account for 1.9 to 3.2 percent of the total area, with the Lower Twelve Mile drainage at the upper end of this range.

Water Quality

The Oregon Department of Environmental Quality (ODEQ) establishes water quality standards for each water body, based on the most beneficial downstream user. The most sensitive beneficial use of streams in the project areas is as habitat for resident fish and aquatic life, and for salmonid fish spawning and rearing (Miner 1996 p. 1). Water bodies that do not meet these standards are placed on the 303(d) list as Water Quality Limited (ODEQ 1998). Rice Creek is the only stream within any of the project areas that is currently listed. This listing is for habitat modification associated with a lack of large wood and resulting low pool frequency.

Stream Temperature

Elevated stream temperatures can result from a lack of stream shading, allowing more direct solar heating of stream surfaces (Moore and Miner 1997). Streams in the project areas are well shaded by 40-60 year-old second-growth stands, though, and solar radiation is not a problem.

Sediment

An increase in fine sediments from forest management activities is often the most adverse effect to streams (MacDonald 1991 p. 98). No streams in the project areas are currently listed as impaired, though BLM personnel have observed some that appear to be affected by excess fine sediment. These included streams within or adjacent to Taylor Made Units D-J and Boomerang Unit F. The headwaters of Rice Creek appear similarly affected. A possible cause may be past harvest operations in riparian areas, including operation of ground-based equipment in stream channels. Surface erosion from old skid trails and roads adjacent to streams is also considered a likely source of increased fine sediment.

Several natural-surface forest roads and old truck roads in the Taylor Made project area are exhibiting severe surface erosion and are sources of fine sediments. In Units G and J, small streams less than 3 feet in width were diverted onto road surfaces for several hundred feet, before re-entering their respective channels. Road 30-9-23.1 in Unit B shows extensive surface erosion with downcutting that is several feet deep. Sections of Road 30-9-14.1, east of Unit I are also actively eroding. Although some natural surface roads are sources of sediment, other old roads have re-vegetated and exhibit little or no evidence of erosion.

There are also two old stream crossings that are in poor condition. Each of these crossings contain several tons of fine sediment, and are at a high risk of failure because they were built on fill that consisted primarily of woody debris. One is located on Road 29-7-25.2 in Unit B of the Rice Bowl project area, in the headwaters of Rice Creek. The second is at the eastern end of an old truck road in Unit F of the Boomerang project area.

Channel Condition and Large Wood

Streams within or adjacent to proposed units are primarily intermittent or small perennial streams, where most of the riparian areas were harvested in a previous entry. Durable, large wood is lacking as a result, and what is available is primarily cull logs and other logging slash. As noted above, Rice Creek is adjacent to units A and B of the Rice Bowl proposal, and is listed for habitat modification. The listing is based on stream surveys conducted by the Oregon Department of Fish and Wildlife in 2001.

Water Rights

There are four registered surface water rights for domestic use, located downstream and within one mile of units in the Taylor Made project area. No effect to downstream users is expected as a consequence of the proposed thinnings, and water rights will not be discussed further.

VI. Soils

Soil survey information was obtained from the National Cooperative Soil Survey conducted by the Natural Resource Conservation Service (NCRS) and United States Department of Agriculture (unpublished). Detailed soil series descriptions, soil mapping unit descriptions and soil interpretation sheets are available at the BLM and NRCS offices in Roseburg.

Approximately 15 soil series are present in the Boomerang project area. While some soil types are shallow, most are moderately deep to deep and are well drained with textures that range from loamy to clayey. Dupee and Zing are somewhat poorly drained and have a tendency to remain wet throughout the year, making more susceptible to puddling or compaction in association with ground-based harvesting.

Five soil series are present in the Rice Bowl project area. The soils are shallow to deep with a loamy and clayey texture. All are well drained.

There are also five soil series present in the Taylor Made project. As in the other two project areas, most soil types tend to be moderately deep to deep with textures that are loamy and clayey, and well drained. Two exceptions are the Dickerson and McNab series. Dickerson series are very shallow. Soils of the McNab series are very deep and somewhat poorly drained, tend to remain wet throughout the entire year and may be more susceptible to puddling or compaction.

In general, past timber harvest practices have reduced the thickness of the A horizon to less than half of what would be found in similar soils where no harvest has occurred. The condition is most prevalent on areas that were tractor logged, with varying degrees of soil compaction and displacement. Main skid trails and natural surface haul roads are readily visible, while secondary trail systems are more discrete or entirely obliterated.

VII. Air Quality/Rural Interface

There are no lands zoned as R5 for 1-5 acre residential properties within ¼ mile of any of the proposed units.

No broadcast burning would be conducted. Landings would be burned in conjunction with some possible roadside hand-piling and burning for hazard reduction. Burning would be conducted in accordance with the Oregon Smoke Management Plan. Piles would be burned during rainy and

unstable periods when winds would disperse smoke, and precipitation would wash particulates from the air. As a consequence, impacts to air quality would be within the range and scope previously identified and addressed in the Roseburg District PRMP/EIS, and air quality will not be discussed further in this analysis.

VIII. Cultural/Historical Resources

The Bureau of Land Management in Oregon, under the authority of the 1997 National Cultural Programmatic Agreement, has entered into an agreement with the State Historic Preservation Office (SHPO). This agreement allows the BLM to complete the section 106 responsibilities without consultation. Documentation is sent to SHPO.

A review of existing records indicates no known prehistoric or historic sites located within the project areas. Field inventories were conducted but located no prehistoric or historic sites. In the absence of any cultural or historic resources, no impacts would be anticipated and they will not be discussed further in this analysis.

IX. Recreation/Visual Resources

None of the proposed units in any of the three project areas are located in proximity to existing or planned recreation sites. Recreational use is of a dispersed nature. There are four small water impoundments, built for fire suppression purposes, where visitors often picnic or go swimming. Other forest activities include hunting, sightseeing, wildlife observation, and gathering of forest greenery and wild foods.

All of the lands near the project areas are classifies as Visual Resource Management (VRM) Class IV lands. This VRM designation allows for high levels of modification to the visual landscape, and activities that may attract the attention of the casual observer. The actions proposed would have a minor affect on the visual landscape.

X. Noxious Weeds

The extent of infestation on the Roseburg District is unknown, but the BLM Oregon State Office reported that the acreage of infestation nationwide increased at the average rate of 14 percent a year between, 1985 and 1991, nationwide. This would suggest an increase of approximately 1,000 acres annually on the Roseburg District, as described on page 7 of the *Roseburg District Integrated Weed Control Plan and Environmental Assessment* (USDI, BLM 1995b).

The Oregon Department of Agriculture (ODA) has developed a rating system for noxious weeds comparable to that contained in BLM Manual 9015 - Integrated Weed Management. The ODA Noxious Weed Rating System designates weeds as types “A” “B,” and “T,” equivalent to types “A,” “B,” and “C” described in BLM Manual 9015 - Integrated Weed Management. Species may be classed in multiple categories.

> Type “A” weeds are of known economic importance. Infestations are small enough that eradication or containment is considered possible, or the weed is not known to occur in the State of Oregon, but its presence in neighboring states make future occurrence in Oregon seem imminent.

Type "B" weeds are considered of economic importance and are regionally abundant, but of limited distribution in some counties. Where a fully-integrated statewide management plan is not feasible, biological control are considered the main approach to control.

Type "T" weeds are designated by the State Weed Board as target weed species on which the ODA will implement a statewide management plan.

Examples of noxious weeds documented or likely to occur in the project areas include but are not limited to:

"A" Noxious Weed	**"B" Noxious Weeds**	**"T" Noxious Weeds**
Woolly distaff thistle	Bull thistle	Yellow starthistle
Purple starthistle	Canada thistle	Woolly distaff thistle
Scotch broom	Rush skeletonweed	

Implementation of the *Integrated Weed Control Plan* by the District is ongoing in an effort to prevent or reduce rates of spread of weed populations. Efforts have included eradication of target species in areas in which management activities are planned, including mechanical treatments, hand-pulling and some limited herbicide spraying. Management practices aimed at reducing the potential for spread or establishing conditions favorable for weed germination are being implemented. These include required steam cleaning or pressure washing of heavy equipment used in logging and road construction, seeding and mulching of exposed soil with native seed, and revegetation of disturbed areas with indigenous plant species. Negligible changes in noxious weed populations are anticipated regardless of the alternative selected, and no further discussion of noxious weeds is necessary in this analysis.

Chapter 4
ENVIRONMENTAL CONSEQUENCES

This chapter discusses how implementation of the alternatives contained in this analysis would or would not affect specific resources in the project areas, in the short term and long term. It also identifies potential impacts or consequences that would expected.

I. Alternative 1 - No Action

This alternative would not meet the purpose and need identified in Chapter 1 (pp. 1-3). It would not achieve a high level of sustained timber production, maintenance of stand health and vigor, density management, diversification of species composition and diversification of habitat. The alternative would not contribute toward the ASQ and socioeconomic objectives of the PRMP/EIS and ROD/RMP, nor meet the requirements of the O&C Act.

The identification of other forest stands within the Matrix and analysis for commercial thinning or regeneration harvest would be necessary to fulfill these objectives.

A. Timber/Vegetation

1. *General Forest Management Areas*

In the absence of thinning, relative stand densities would continue to increase. Densities are approaching or already exceed 0.63, and would continue to increase with a corresponding increase in suppression mortality among trees in the suppressed and intermediate crown classes. Over time, height growth would slow, canopies would become more closed, and the crowns of individual trees would continue to recede.

As the live crown in individual trees decreases below 30 percent, tree vigor would decline. Individual trees would be less capable of adapting to and surviving disturbances, becoming more susceptible to wind damage, insect attack and disease. Potential release in response to any future thinning treatments would also decrease.

SW Organon version 6.0 was used to project the growth of the stands out to the Culmination of Mean Annual Increment (CMAI), in the absence of treatment. CMAI can be described as the point in time at which a stand achieves its greatest annual increase in volume growth, and after which that rate of growth begins to decline. The expected future conditions of the stands in the three project areas, if left untreated, are summarized in Tables 8-10.

Table 8 – Boomerang Stand Conditions at CMAI Untreated

Unit	Age at CMAI	Trees per Acre	% Crown Closure	Quadratic Mean Diameter (inches)	Basal Area Sq. ft.	RDI
A	98	122	92	21.4	303.4	0.777
B & C	101	112	91	24.3	360.0	0.854
D	104	104	92	25.5	365.7	0.874
E & H	85	179	96	18.3	324.7	0.885
F	97	169	96	19.5	349.6	0.929
I	89	140	94	20.3	313.3	0.820
J	99	149	93	21.5	373.0	0.954
K	89	140	94	20.3	313.3	0.820

Table 9 - Rice Bowl Stand Conditions at CMAI Untreated

Unit	Age at CMAI	Trees per Acre	% Crown Closure	Quadratic Mean Diameter (inches)	Basal Area Sq. ft.	RDI
A	131	132	100	21.2	323.3	0.830
B	136	90	94	22.5	375.4	0.943

Table 10 - Taylor Made Stand Conditions at CMAI Untreated

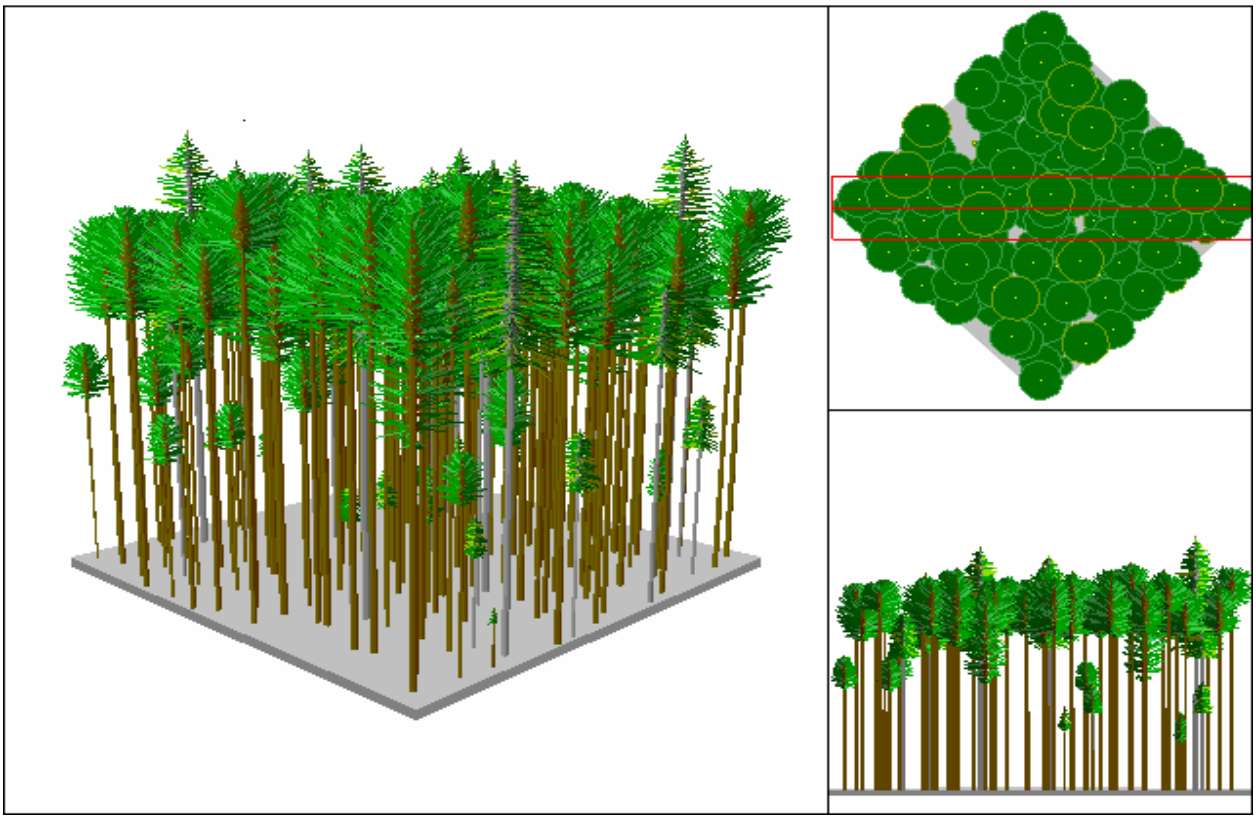
Unit	Age at CMAI	Trees per Acre	% Crown Closure	Quadratic Mean Diameter (inches)	Basal Area Sq. ft.	RDI
A	108	123	92	23.6	375.6	0.925
B	103	164	97	18.2	295.4	0.807
C	86	289	100	12.6	248.8	0.786
D, E, F, G & H	99	123	91	23.9	383.4	0.939
I	103	131	96	19.8	281.1	0.742
J	89	160	93	20.3	359.6	0.940

2. *Riparian Reserves*

The current growth trajectory would result in single-storied, not multi-storied stands. Older, natural stands appear to have developed under conditions of low tree density. Research indicates that tree density may have been no greater than 50 trees per acre. These stands regenerated over time with little competition between individual trees. It is considered improbable that old-growth stands had high tree densities comparable to managed second-growth stands, and that densities were greatly reduced by disturbances which left only the larger trees. Disturbances of a magnitude sufficient to regenerate Douglas-fir in the old stands are generally absent in young, intensively managed stands (Tappeiner, et al. 1997).

Shade-tolerant species, such as grand fir and western redcedar, would remain suppressed in the understory. There would not be sufficient sunlight to allow conifer and hardwood regeneration beneath the closed canopies. Figure 2 displays anticipated riparian forest conditions if left untreated and grown to CMAI.

Figure 2 – Untreated Riparian Reserve Conditions at CMAI



The number of large snags would decline as they age, deteriorate and fall, and available habitat provided by large wood would decline as the wood decays. Suppression mortality would occur primarily in small trees and not provide large material that would persist.

Suppression could eventually eliminate hardwoods in the Riparian Reserves, and simplify the vegetative composition, rather than provide a broad range of habitat for a healthy and diverse assortment of terrestrial and riparian-dependent wildlife species. This would be inconsistent with ACS objectives and management direction to develop structural diversity and habitat components characteristic of late-successional and old-growth forest that would provide dispersal paths for terrestrial species dependent on this type of habitat.

3. Port-*Orford-cedar and Port-Orford-cedar Root Disease*

Any road associated activities occurring within the Upper Middle Fork Coquille watershed analysis unit may potentially spread the root disease, whether authorized by the BLM, privately undertaken, or casual in nature. Under this alternative, the BLM would not harvest any timber. Renovation or improvements to BLM roads in the project areas would not be undertaken at this time. Road use by private landowners, permittees, and the recreating public is beyond the management control of the BLM and would continue.

Most private timberlands within the watershed are managed on a 40-to-60-year rotation. Thinning or regeneration harvest of several thousand acres would be reasonably foreseeable over the next 3-5 years. Timber would be hauled over both private and BLM roads. Under reciprocal rights-of-way agreements the BLM has little or no discretion to specify terms under which adjacent landowners may use BLM roads and haul across BLM-managed lands. Similarly, discretion is limited in the consideration of permittee requests for permission to improve existing roads or construct new ones.

The best available information on recent spread of the disease comes from site-specific mapping of infected areas, conducted between 1994 and 1999. The rate of spread, estimated at 8 acres annually, would remain relatively constant under this alternative.

B. Wildlife

1. *Threatened or Endangered Species*

a. Northern Spotted Owl

Under this alternative there would be no direct, short-term consequences to the northern spotted owl. Stand conditions would remain relatively unchanged. While they would provide dispersal habitat and limited foraging opportunities, quality foraging habitat would not develop over the long term. Hardwood trees and other understory vegetation that provide cover and forage for prey species would die out under closed canopies.

In the long term, GFMA stands would not be expected to provide nesting habitat because they would be regeneration harvested at approximate CMAI. Riparian Reserves would continue to provide dispersal habitat, but in the absence of density management, foraging quality would decline and the development of late-successional conditions favorable for nesting would be delayed by many decades.

b. Marbled Murrelet

Under this alternative, there would be no direct, short-term consequences to suitable murrelet nesting habitat in the near term because there would be no removal of trees that could modify current habitat.

As noted above, stands allocated as GFMA would be scheduled for harvest at CMAI. Individual trees would not be expected to develop the structure associated with suitable nesting habitat. In the long term, absent density management, high stem densities would persist in the Riparian Reserves. Older trees would die, leading to a gradual decline in the number of currently available nesting trees. Competition between individual trees in a closed canopy would lead to recession of individual crowns and natural limb pruning. Nest structure provided by lateral crown development and large limbs would be lost or retarded.

2. *SEIS Special Attention Species*

Under this alternative, there would be no habitat disturbance or modification. As a consequence, there would be no effect on any species covered by the standards and guidelines governing the Survey and Manage Species program.

C. Vascular and Non-Vascular Plants

In the short-term, this alternative would not directly impact any special status or special attention species that may be present in the project area, because there would be no disturbance or modification of present habitat. Those species dependent upon early and mid-seral habitat would be indirectly affected in the long term as normal processes of succession gradually modify habitat conditions, allowing establishment of new plant communities that are better suited and adapted.

D. Fish and Essential Fish Habitat

In the absence of any management activities, there would be no effect on anadromous fish or Essential Fish Habitat. Fish populations and habitat would continue to be cumulatively affected, though, by watershed conditions that are presently degraded.

Roads, stream crossings and culverts in the project areas that have been identified as chronic sources of fine sediment would not be repaired, replaced or removed at this time. Excess sediment from roads, such as those in the Taylor Made project area, and described on p. 21, would continue to degrade water quality. In the event one of the stream crossings also should fail, a debris torrent would scour the stream channel and erode the stream banks. The results could include embedded substrates, or loss of spawning gravels. In the case of Rice Creek this would almost certainly result in adverse effects on individual fish and Essential Fish Habitat.

Without density management in Riparian Reserves, the growth rate of trees most likely to contribute large wood to stream channels (FEMAT 1993) would stagnate. Without some other form of disturbance, the stands would remain relatively uniform in age and species composition, resulting in the development of simplified size and age class distributions. This would result in stands dominated by smaller trees, and would be inconsistent with the objective of developing old-growth forest characteristics.

The short and long term availability of large wood would not be sufficient to meet needs for habitat, stream structure and organic nutrients. Suppression mortality would occur primarily in smaller trees. This smaller diameter material would not persist over time. The growth of large diameter trees for future recruitment of large wood into streams and riparian areas would be delayed by decades.

E. Water Quality/Resources

Under this alternative, there would be no potential for altering the timing and magnitude of peak and base flows, because there would be no alteration of vegetative cover or change in present road density.

Drainage and sediment problems from existing roads would remain uncorrected. Failure of one of the stream crossings described above would result in heavy sedimentation from stream bank and channel scour.

The period of time necessary to grow large trees in the Riparian Reserves would be lengthened by decades. In the interim, there would be insufficient large down wood for in-stream structure and habitat, and the protection of stream morphology and function.

F. Soils

In the absence of any thinning and density management, there would be no direct effect on soils. Tilling or sub-soiling to ameliorate compaction on existing skid trails and dirt haul roads would not be undertaken. Ongoing erosion of natural-surface roads would.

Other Matrix stands would be analyzed for timber harvest. Potential soil disturbances such as compaction, displacement, and surface erosion would potentially occur in those areas.

II. Alternative 2 - Proposed Action

This alternative would meet the objectives and management direction described in the purpose and need for action in Chapter 1 (pp. 1-3) of this analysis, and would contribute toward the annual ASQ for the Roseburg District, and socioeconomic objectives of the ROD/RMP.

A. Timber/Vegetation

- *General Forest Management Areas*

  As discussed in Chapter 2 (p. 4), thinning would remove approximately 1/3 of the basal area and reduce the RDI to between 0.35 and 0.45. The thinning would also reduce crown closure that typically averages around 90 percent, to approximately 60-70 percent. These figures were generated by computer modeling. They will vary between individual stands, however, and may be higher or lower than the stated values.

  Tables 11-13 describe the expected stand conditions, and Figure 2 is representative of the anticipated appearance of the GFMA stands following proposed thinning.

Figure 3 - Post-Thinning Stand Appearance

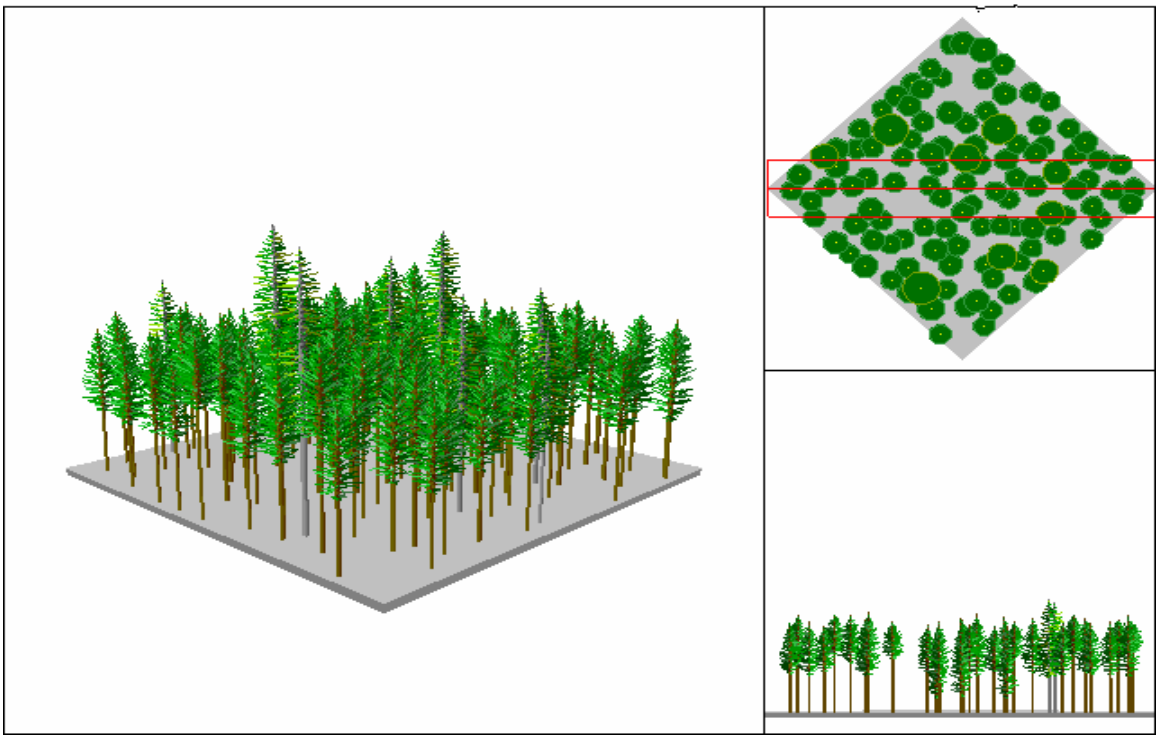


Table 11 – Expected Post-Treatment Stand Conditions for Boomerang Thinning

Unit	Trees per acre	Average Spacing (ft)	Quadratic Mean Diameter (inches)	% Crown Closure	Basal Area Sq. Ft.	RDI
A	115	20	13.8	70	120	0.365
B & C	101	21	15.3	72	130	0.380
D	99	21	15.5	77	130	0.378
F	110	20	14.1	60	120	0.362
E & H	116	19	14.4	60	130	0.390
I	101	21	14.7	65	120	0.356
J	116	19	14.4	68	130	0.390
K	101	21	14.7	65	120	0.356

Table 12 – Expected Post-Treatment Stand Conditions for Rice Bowl Thinning

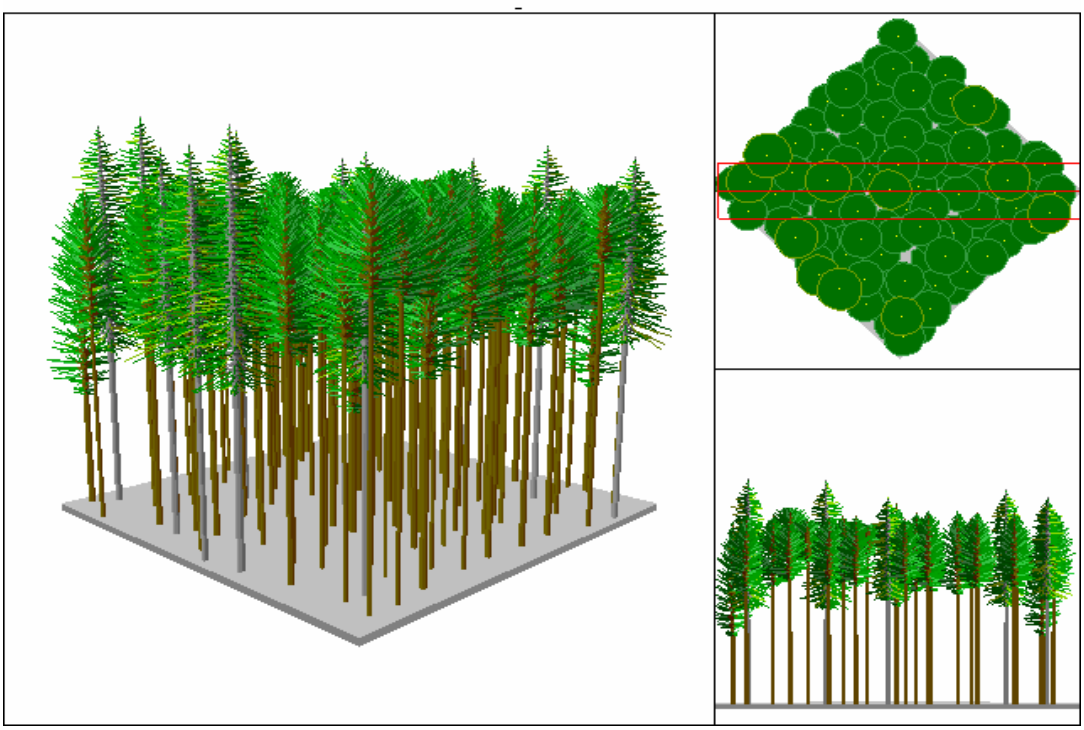
Unit	Trees per acre	Average Spacing (ft)	Quadratic Mean Diameter (inches)	% Crown Closure	Basal Area Sq. Ft.	RDI
A	101	21	15.4	64	130	0.379
B	104	20	16.2	58	150	0.428

Table 13 – Expected Post-Treatment Stand Conditions for Taylor Made Thinning

Unit	Trees per acre	Average Spacing (ft)	Quadratic Mean Diameter (inches)	% Crown Closure	Basal Area Sq. Ft.	RDI
A	101	21	15.4	67	130	0.379
B	105	20	13.2	47	100	0.310
C	89	22	17.6	54	150	0.415
I	116	19	13.2	51	110	0.341
D, E, F, G & H	106	20	15.0	72	130	0.383
J	109	20	14.8	65	130	0.385

Figure 4 illustrates the anticipated appearance of stands grown to an age of 102 years.

Figure 4 – GFMA Stand Structure at 102 Years of Age



- *Riparian Reserves*

As discussed in Chapter 2 (p. 4), density management would reduce the RDI to between 0.25 and 0.3, and create variable densities across the Riparian Reserves. This would involve the removal of 45-50 percent of the basal area.

The treatments would create small openings, generally less than ¼-acre variable in size, and comprising no more than 10 percent of the Riparian Reserve area. These openings would help promote understory development and vertical diversity, as well as accelerated growth of individual overstory trees. (Hayes et al. 1997)

Trees selected for retention would include deformed or broken-top trees to provide for snags and other nesting habitat. Untreated areas would allow passive development of snags, and accumulation of down wood through suppression mortality. Figure 5 depicts treated Riparian Reserves at age 102-years. Table 14 describes approximate conditions.

Figure 5 – Riparian Reserve Appearance at 102 Years of Age

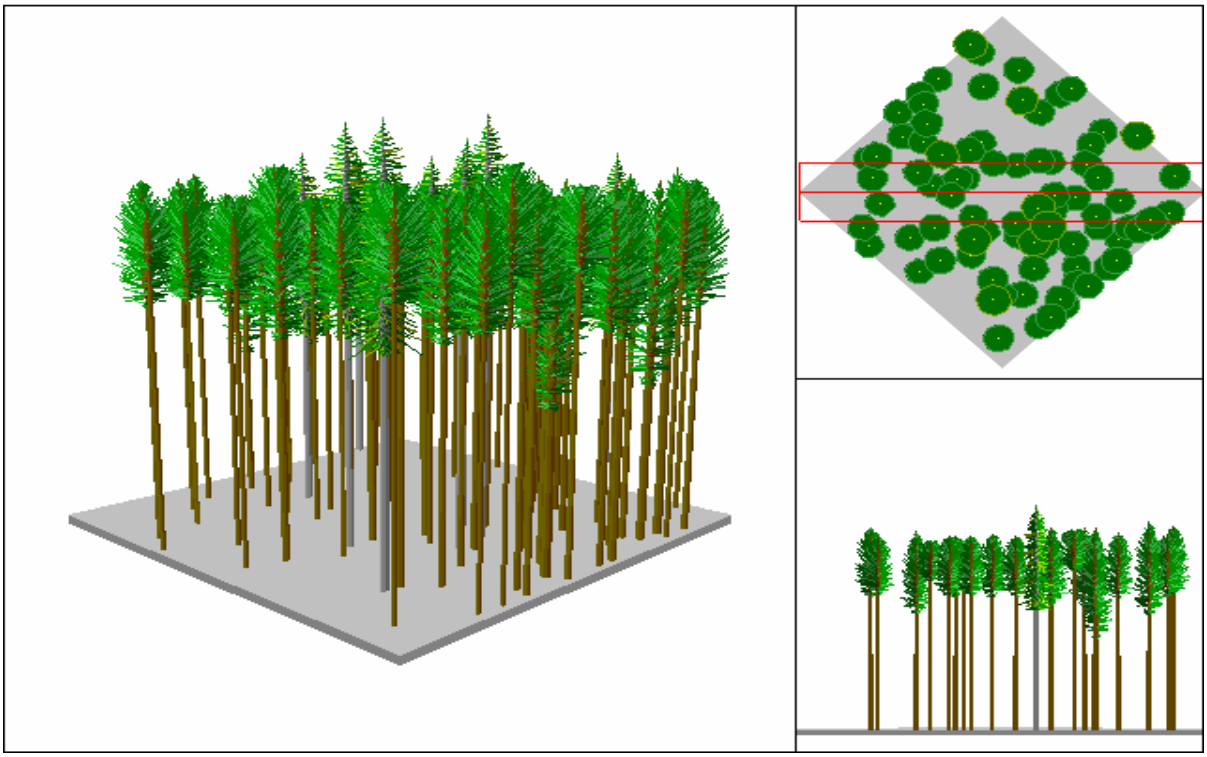


Table 14 - Post-Treatment Riparian Reserve Conditions

Unit	Trees Per Acre	Average Spacing (ft)	% Crown Closure	RDI	Basal Area Sq. Ft.
Boomerang A	75	24	52.6	0.266	90
Boomerang B, C	70	25	56.0	0.286	100
Boomerang D	65	26	60.2	0.282	100
Boomerang F, G	72	25	45.5	0.264	100
Boomerang I	69	25	48.8	0.262	90
Boomerang J	69	25	46.4	0.262	90
Boomerang K	69	25	48.8	0.262	90
Rice Bowl A	65	26	47.2	0.282	100
Rice Bowl B	60	27	41	0.245	110
Taylor Made A	57	28	48.3	0.252	90
Taylor Made B	91	25	42.1	0.277	90
Taylor Made D, E, F, G, H	54	28	48.8	0.249	90
Taylor Made I	92	25	59.3	0.277	90
Taylor Made J	66	26	45.2	0.26	90

3. *Port-Orford-cedar and Port-Orford-cedar Root Disease*

Since there is no Port-Orford-cedar in the Rice Bowl project area, nor along the proposed haul route, implementation of this project would have no effect on the occurrence or spread of *P. lateralis.*

Since roads are a primary vector by which *P. lateralis is* spread, the following road management actions would be implemented to minimize the likelihood of transporting infested soil.

- Road construction, renovation and decommissioning would be restricted to the dry season when the risk of spreading spores is least likely.

- Approximately 2.7 miles of unsurfaced roads would be surfaced with rock, and 1.9 miles of unsurfaced roads would be decommissioned or closed to eliminate vehicular use during wet weather when risk of transporting spore infested soil is greatest.

- All non-merchantable Port-Orford-cedar trees within 20 feet on the uphill side and 50 feet on the downhill side of haul routes would be cut, under a service contract, to remove potential host trees that could become infected and spread the disease. This would eliminate Port-Orford-cedar root disease concerns in the Boomerang project area.

- All logging and road construction equipment, excepting log trucks which are restricted to roads, would be steamed cleaned or pressure washed prior to move-in on contract areas, or prior to return if moved off-site during the life of the contracts. Cleaning greatly reduces the risk of importing infested soil into unaffected areas.

- Water taken from sources in the project areas for use in road construction, road grading or dust abatement would be treated with a solution of Clorox bleach, to kill any *P. lateralis* spores that might be present.

The following design features would be applied to thinning layout and contract provisions to reduce the risk of disease in association with the proposed sales.

- All merchantable Port-Orford-cedar trees within 20 feet on the uphill side and 50 feet on the downhill side of roads bordering or passing through units, and astride haul routes would be cut under the sale contracts to remove potential host trees that could become infected and spread the disease.

- Port-Orford-cedar trees selected for retention would be spaced a minimum of 50 feet from other Port-Orford-cedar trees to eliminate the possibility of disease spread through root grafting. Clumps of 3 or 4 trees could be retained as a group, but other Port-Orford-cedar to be retained would be a minimum of 50 feet from the group.

- Thinning operations would be sequenced so that areas with documented infection are harvested last to avoid transport of spores into uninfected areas.

- Thinning any areas accessed by unsurfaced roads would be restricted to summer operations.

With the project design features and controls described, and in light of the scattered occurrence of Port-Orford-cedar within the project areas, no measurable increase in the rate of spread of the root disease would be anticipated, and the management actions may actually reduce spread of the disease.

B. Wildlife

1. *Threatened or Endangered Species*

a. Northern Spotted Owl

Only the two units of the Rice Bowl project, and Units B and C of the Taylor Made project are overlapped by owl home ranges. None of the units are located within ¼-mile of an activity center, so the potential for disturbance during nesting season would be less than negligible.

Thinning would only occur in stands that provide dispersal habitat, and limited foraging opportunities. No suitable nesting and roosting habitat would be removed or modified. In the first 10-15 years after thinning, those units within a provincial territory, particularly those closest to activity centers, may see a decline in utilization by owls because of the more open stand and canopy conditions.

Within 15 years of thinning, canopy closure would return to pre-thinning levels, and use by owls for dispersal and foraging would be expected to rise. The units would develop greater structural and vegetative complexity and provide habitat capable of supporting more abundant prey and greater foraging opportunities. The GFMA portions of the units would not be expected to provide nesting and roosting habitat, as they would be scheduled for regeneration harvest at CMAI. Portions of the units located in Riparian Reserves would continue to mature, however, and develop late-successional characteristics that would provide nesting habitat as well as dispersal pathways.

b. Marbled Murrelet

Thinning of the Rice Bowl and Boomerang projects would have no direct effect on marbled murrelets, as these project areas are beyond the Marbled Murrelet Management Zone and outside of the generally accepted range of

the species. Only units comprising the Taylor Made proposal are located within the Marbled Murrelet Management Zone.

Units D and J have been evaluated as suitable habitat, with another 9 acres of suitable habitat contiguous to them. Two years of protocol surveys would be conducted. If nesting murrelets are detected, the units would be modified to exclude occupied habitat, or omitted from the project.

In the absence of confirmed occupancy, the potential for disturbance to birds occupying the area would still exist in the form of unsurveyed suitable habitat within ¼-mile. To reduce this possibility, daily operational restrictions would be implemented. These would consist of a prohibition on thinning operations from a period 2 hours before sunset until 2 hours after sunrise, and would apply during the nesting and fledging season, from April 1st through August 5th.

Thinning of the remaining units in the Taylor Made proposal would have no direct effect on murrelets because they are not considered suitable habitat. In the long term, as the stands mature, crown expansion and lateral development would provide additional crown interaction and canopy structure providing nesting platforms for murrelets. This would be particularly true for portions of the units allocated as Riparian Reserves, and not subject to regeneration harvest at CMAI.

2. *Effects Determination for Threatened or Endangered Species*

a. Northern Spotted Owl

Because no thinning operations would occur within ¼-mile of any nesting sites, it was determined that thinning would have "No effect" with regards to disturbance.

Despite long-term improvement in habitat, including the development of higher quality roosting and foraging habitat, thinning could alter current utilization of the stands by owls and modify dispersal habitat. The effect was determined to be one of "may affect, not likely to adversely affect" owls.

b. Marbled Murrelet

For the Rice Bowl and Boomerang project areas, thinning would constitute "No Effect" as the areas are beyond the accepted range of the species.

The application of daily operational restrictions on Units D and J of the Taylor Made proposal would reduce the risk for disturbance to less than negligible and would constitute a "May affect, not likely to adversely affect" determination.

Because the thinning would not remove or modify any suitable nesting habitat, the determination was that the Taylor Made project would have "No Effect" on nesting habitat.

3. *SEIS Special Attention Species*

The proposed thinnings would have no effect on the Oregon shoulderband snail. The project areas would be evaluated for the presence of suitable habitat. Where suitable habitat is present, surveys would be conducted. If populations of the snail are located, the sites would be protected consistent with the management recommendations in effect at the time of decision or decisions are made to implement thinning projects. These recommendations are designed to maintain habitat features and climatic conditions necessary for persistence of the species.

C. Vascular and Non-Vascular Plants

This alternative would have no direct effect on any special status or special attention species that may be present in any of the 3 project areas. If located, occupied sites would be managed in accordance with the current management recommendations designed to provide for persistence of the population(s).

Surveys would be conducted on the 4 proposed Boomerang thinning units, identified in Chapter 3 (p. 17), where suitable Kincaid's lupine habitat is present. If populations of the species are located, the sites would be protected in accordance with recommendations for protection of habitat conditions and persistence of the population(s). Under these circumstances, the proposed action would have "No Effect" on the species.

E. Fish and Essential Fish Habitat

1. *Aquatic Habitat Conditions*

Effects of Thinning

Thinning operations would not have any direct effects on aquatic habitat. The establishment of "no-harvest" buffers, described in Chapter 2 (p. 5), would serve to filter out any overland sediment transport. The retention of trees in the "no harvest" buffer, directional felling of trees away from buffers, and the reservation of existing down wood would maintain streamside shading, protect stream bank and channel integrity, and maintain existing large wood and pool habitat.

Density management in Riparian Reserves would increase the growth rate of trees in areas that are the most likely to contribute large wood to streams (FEMAT 1993, pp. V-26 & 27), and allow forest within the Riparian Reserves to develop at a rate consistent with the thinned upland stands. This would reduce by decades, the time in which large wood would become available for recruitment into streams. This would increase pool frequency and quality in perennial

streams, and enhance habitat for resident and anadromous fish.

Effects of Timber Hauling

Road run-off during wet weather could result in the transport and deposit of fine sediment into streams. Sediment could increase turbidity and become embedded in spawning gravels.

Proposed renovation of existing rocked roads and unsurfaced roads would reduce the generation of fine sediment. Initial surfacing or resurfacing of roads would reduce erosion. Stabilization of road cuts and fills would reduce the potential for road failure and erosion.

Reshaping road ditch lines and profiles would remove water from road surfaces and reduce erosion. Installation of additional cross-drainage would disperse run-off across forest slopes rather than concentrating and delivering water directly to streams. Sediments would settle out on slopes rather than reach live streams.

Seasonal restrictions would reduce the potential for sediment by excluding haul on unsurfaced roads during the wet season.

With the implementation of these best management practices and project design features, the probability of generating sediment would be low. Areas where sediment would remain a concern would be primarily associated with stream crossings and those areas where roads are located in close proximity to streams. The effect of any sediment reaching an active stream would be localized and not expected to persist beyond the first wet season following operations.

Effects of Road Decommissioning and Stream Crossing Removal

The potential consequences from road decommissioning and stream crossing removal are from sediment. Potential sources would include erosion of exposed soils following removal of fill material, road subsoiling, and the removal of cross-drain and stream-crossing culverts.

In order to reduce the potential for sediment from subsoiling and cross-drain removal, best management practices and project design features could include:

- Revegetation of subsoiled, excavated or other disturbed areas.
- Installation of drain dips or waterbars.
- Armoring of drain dips and ditch lines with rock.

To minimize the potential for sediment associated with the removal of stream crossings, measures to be implemented could include:

- Placing an absorbent boom downstream of the project site prior to the start of construction activities, to contain any inadvertent petroleum spills.

- Limiting in-stream work to the period between July 1 and September 15, when stream flows are at their lowest levels.

- Pumping or diverting stream flow around the project area during in-stream work, and minimizing in-stream equipment operation to the greatest extent practicable.

- Hauling all waste material to an authorized upland disposal site.

- Revegetating stream banks.

2. *Threatened or Endangered Species*

The only potential effect to Oregon Coast coho salmon would be associated with sediment from timber hauling, road decommissioning and stream crossing removal, as there are no there environmental or habitat features that would be affected. Effects could include reduced respiratory efficiency resulting from gill irritation, and reduced feeding efficiency resulting from reduced visibility. The effects to the Oregon Coast steelhead trout would be comparable to those for the coho salmon.

3. *Effects Determination for Threatened or Endangered Species*

There are no threatened or endangered species within 2 miles of any units in the Taylor Made project area because of natural barriers to anadromous passage described in Chapter 3 (p. 19). Any effects from sediment would remain localized. As a consequence, activities in this project area would be expected to have "No Effect" on coho salmon or steelhead trout.

Effects of Thinning

Thinning in the Rice Bowl and Boomerang project areas would have "No Effect" on coho salmon or steelhead trout. The establishment of "no-harvest" buffers would adequately filter any sediment transported overland, prior to it reaching any live streams. This is because forest soils in the Pacific Northwest have very high infiltration capacities and are not effective in transporting sediment by rain splash or sheet erosion (Dietrich et. al. 1982).

Effects of Timber Hauling

The potential for sediment during periods of wet weather would exist, but with seasonal restrictions and road renovation measures described on p. 39, these amounts would be negligible when compared against existing background levels. In the long term, the proposed road renovation would reduce sediment at the drainage level. As a consequence, a determination was made that timber hauling "may affect, but would not adversely affect" the coho salmon and steelhead trout.

Effects of Road Decommissioning and Stream Crossing Removal

The effects of sediment from the removal of stream crossings would be short term, lasting through the first winter following the removal. While there would be long term benefits in reduced sediment, and the removal of the risk of a future debris torrent, the short term consequences are "likely to adversely affect" coho salmon and steelhead trout, consistent with those effects addressed in the National Marine Fisheries Service *Programmatic Biological and Conference Opinion for Programmatic Activities Affecting SONC Coho Salmon,OC Coho Salmon, and OC Steelhead* (USDC 2002).

The effects on fish populations are not anticipated to result in the likelihood of jeopardy, however, nor in destruction or adverse modification of aquatic habitat. The extent of incidental take, if any, would not be measurable as a long-term effect on population levels.

4. *Effects Determination for Essential Fish Habitat*

Effects on Essential Fish Habitat would be comparable to those identified for listed fish species. Thinning would have "No Effect", timber hauling "may affect" but would be "not likely to adversely affect" habitat. As described above, stream crossing removal would "adversely affect" Essential Fish Habitat, particularly in the Rice Bowl project area, but only in the short term.

E. Water Quality/Resources

Peak Flows and Annual Yield

No measurable effect to stream flow would be expected as a result of commercial thinning and density management because it would only involve partial removal of vegetation over areas constituting no more than 2 percent of the affected drainage. In an overview of several studies, Satterlund and Adams (1992, p. 253) found that "lessor or nonsignificant responses occur [to streamflow] . . . where partial cutting systems remove only a small portion of the cover at any one time." Where individual trees or small groups of trees are harvested, the remaining trees will generally use any increased soil moisture that becomes available following timber harvest.

Water Quality

Stream Temperature

Density management in Riparian Reserves could potentially increase stream temperature by creating canopy openings and temporarily reducing shade that is important in maintaining cool water temperatures in the summer months. Most of the streams within or adjacent to proposed units are intermittent in nature, however, and provide little or no surface flow to perennial stream reaches during the summer when elevated water temperatures are of concern. Consequently, density management adjacent to intermittent streams would have a negligible effect on stream temperature.

Perennial streams are small, with an estimated water surface width of 3 feet or less during summer flows. Density management adjacent to these streams would have a negligible effect. The "no-harvest" buffers, a minimum of 20 feet in width, would retain canopy above stream channels and provide adequate shade for maintaining stream temperatures.

Sediment

Density management in Riparian Reserves could cause localized soil disturbance and a short-term potential for erosion, resulting from felling and yarding operations. However, the previously described "no-harvest" buffers would filter out any sediment prior to it reaching live streams.

Yarding corridors might be needed across an intermittent stream in the northwest corner of Unit A in the Boomerang project. These would be designed to minimize disturbance of the stream channel, with the final locations approved by the contract administrator prior to any cutting. Corridors would be a maximum of 20 feet in width and 200 feet apart, where practical, to minimize the number of corridors. Yarding would be restricted to the dry season during low flows, and any trees cut in the "no-harvest" buffer would be felled toward the stream channel and left to provide bank armoring.

Forest roads are a major contributor of fine sediment, resulting from downcutting of ditch lines and erosion of unsurfaced roads. Slope failures can also occur when road drainage is concentrated on unstable or erosive fill slopes. Failure of inadequate stream crossings can also result in the production of large quantities of sediment to streams.

Permanent road construction would be limited, and surfaced prior to any harvest and hauling activities. Roads would be located in stable upland locations,well away from any streams. Construction would incorporate best management practices (ROD/RMP, pp. 131-136) designed to minimize potential erosion and sediment transport. These would include minimizing excavation and endhauling waste material to stable upland disposal sites rather than sidecasting. Road surfaces would be shaped and cross-drains installed so that run-off is distributed across the landscape rather than concentrated. As a result there would be little potential for sediment delivery.

Temporary roads would also be located in stable areas away from streams and would employ construction features similar to those applied to permanent construction. As noted in Chapter 2 (p. 7), the intent would be to construct, use and decommission these roads in a single dry season. If not possible, these roads would be winterized or surfaced, and decommissioned the following year. In either event, because these roads would not be accessible to vehicular use during the wet season, for use, they would not be considered a risk for sediment.

Temporary crossings would be installed on roads to be renovated, where stream crossings have washed out or previously removed. The crossings would be removed when the respective roads are decommissioned following thinning operations. These temporary crossings would be limited to small, intermittent crossings. Construction of the crossings could result in small amounts of sediment entering the streams during the first winter following construction and removal. Measures to reduce sediment potential during construction and removal would be consistent with those described in association with stream crossing removal (p. 39). Additional measures could include using clean rock as fill, recontouring stream banks, installing geotextile fabric, or armoring with rock.

As discussed above (p. 38), proposed renovation of existing rocked roads and unsurfaced roads would reduce erosion and potential sediment.

Stabilization of road cuts and fills would reduce the potential for road failure and erosion. Reshaping ditch lines and road profiles would remove water from road surfaces and reduce erosion. Installation of additional cross-drainage would disperse run-off across forest slopes rather than concentrating and delivering water directly into streams. Suspended sediments would settle out on slopes rather than be carried into live streams.

Road decommissioning would remove approximately 2.3 miles of unsurfaced roads that are presently sources of sediment. As described earlier in this analysis, this would include removing two stream crossings that are at risk of failure, and rerouting of some small intermittent streams out of roads and into their original channels. Removal, or closing and stormproofing these roads would further reduce fine sediment within the project watersheds.

Channel Condition and Large Wood

Most streams within and adjacent to units are intermittent, headwater streams. Density management in Riparian Reserves would improve channel conditions and function in intermittent and perennial streams. One function of Riparian Reserves is to maintain the structure and function of intermittent streams, which store sediment and wood and serve as sources of these materials for permanently flowing streams (FEMAT 1993 p. V-36).

Density management in Riparian Reserves would increase tree growth rates in the area most likely to contribute large wood to stream channels (FEMAT 1993, pp. V-26&27).

This would accelerate the growth of individual trees in the Riparian Reserves, allow them to develop at a rate consistent with the thinned upland stands, and reduce the time until large wood becomes available for recruitment into streams. If deemed necessary, reserved trees would be available for felling to provide immediate recruitment. Avoiding treatments in the Riparian reserves would create a situation where the largest trees are furthest from the stream channel with less chance of interacting with the stream.

Large wood captures and stores sediment and is critical in maintaining step-pool morphology in many small headwater streams. Research showed up to 15 times the annual sediment yield was stored behind wood in Idaho streams, and between 100 to 150 years of average annual bedload was stored behind wood debris in steep tributary streams in northern California. A recent study (Curran 1999) found that spill resistance from step-pool reaches contributed 90 percent of the friction responsible for reducing water velocity in some Western Washington headwater streams. This would protect the structure of stream banks and channels, and delay flow during storm events and reduce peak flows downstream.

F. Soils

In order to minimize impacts to soils and maintain or improve long-term soil productivity, one or more of the following project design features and Best Management Practices would be incorporated into sale layout and contract provisions:

- Existing skid trails would be used to the greatest degree practicable.
- Ground-based operations would be limited to slopes of less than 35 percent.
- Ground-based operations would be seasonally restricted as described in Chapter 2 (p. 5) when soil moisture content is at its lowest, and soils are most resistant to compaction. For areas with somewhat poorly drained soils, such as those of the Dupee, McNab and Zing series, described in Chapter 3 (p. 22), ground-based operations would be avoided if conditions of soil moisture warrant.
- Major skid trails, including those from previous entries, would be selectively tilled. Tilled areas would be mulched and seeded, or treated in other manners to retard erosion.
- Major skid trails that are not treated during this proposed entry, would be inventoried so that treatment could be accomplished at a future time or at regeneration harvest.

Cable yarding could result in soil displacement and potential erosion. To reduce potential impacts, the following project design features would be implemented:

- Yarding would be restricted to the use of equipment capable of maintaining a minimum of one-end log suspension to reduce surface disturbance.

- The yarder would be equipped with a minimum of 100 feet of lateral yarding capacity to reduce the percentage of the surface area subject to potential surface disturbance.

Jeep trails and natural surface roads not needed as part of the transportation system and readily accessible to equipment would be tilled to enhance soil productivity. Natural surface roads, predating the proposed action, that are retained in the transportation system would not be tilled, but would be storm-proofed and closed to vehicular traffic.

III. Other Federal Timber Harvest and Restoration Activities Planned in the Project Watersheds

Middle South Umpqua River/Rice Creek Watershed

At present there are no other timber harvest or restoration actions planned, or under consideration in the next 3-5 years in the watershed.

Lower Cow Creek Watershed

In addition to the Boomerang commercial thinning proposed in this analysis, two regeneration harvests were previously planned in the watershed, with implementation scheduled in the next 5 years. The Cow Catcher and Loose Laces timber sales would harvest approximately 345 acres of mature timber. The two analyses propose no permanent road construction. Temporary and semi-permanent construction is estimated at 1.63 miles. In addition to the main haul roads, another 0.70 miles of permanent road, and 0.55 miles of unsurfaced roads are proposed for renovation. Following the completion of the sales, approximately 2.3 miles of road would be decommissioned subject to agreement by parties holding reciprocal rights.

Restoration work planned in the watershed is currently limited to the replacement of a large stream crossing on Russel Creek. Completion is anticipated in the summer of 2003.

Upper Middle Fork Coquille Watershed Analysis Unit

There is one commercial thinning of 52 acres that is currently active (Kola's Ridge). There is no permanent road construction, and only 0.12 miles of temporary construction that will be decommissioned afterwards. Road renovation totals 0.80 miles.

A second thinning (Angel Hair) of 93 acres, analyzed in the Middle Fork Coquille Commercial Thinning 2001 EA, was offered at auction in February of 2003. Three additional thinning sales (Diet Coq, Golden Gate and Smoke Screen) from this analysis will be offered over the next 4 years. In association with these sales, 200 feet of permanent road construction and 2.25 miles of

temporary road construction are proposed. Renovation will total approximately 13.7 miles. Post-project decommissioning of approximately 11 miles of road is proposed.

One regeneration timber sale is planned (Ragu) which would harvest approximately 117 acres in this watershed, and 10 acres in an adjoining watershed. No permanent road construction is proposed. Approximately 0.3 mile of temporary/semi-permanent road would be built. Renovation of 6.88 miles of road would be done, with 1.62 miles of decommissioning proposed subject to the agreement of parties with reciprocal rights.

There are currently no restoration projects planned. Three large stream crossings were replaced on Bingham Creek and Holmes Creek in the summer of 2002. The effects of these projects on sediment and water quality will have dissipated by the end of the summer of 2003.

IV. Monitoring

Monitoring would be done in accordance with the ROD/RMP, Appendix I (p. 84, 190, 193, & 195-199), with emphasis on assessing the effects of commercial thinning/density management on the following resources: Riparian Reserves; Matrix; Water and Soils; Wildlife Habitat; Fish Habitat; and Special Status and SEIS Special Attention Species Habitat.

Chapter 5
LIST OF AGENCIES/PERSONS CONTACTED AND PREPARERS

This project was included in the Roseburg BLM Project Planning Update (Spring 2002). A notice of decision will be published in the Roseburg *News-Review* if the decision is made to implement any of the projects described in this analysis.

I. Agencies & Persons Contacted:

Adjacent Landowners
Cow Creek Band of Umpqua Indians
NOAA Fisheries
Registered Down-Stream Water Users
U.S. Fish and Wildlife Service

II. Preparers and Contributors:

Paul Ausbeck	NEPA Coordinator/EA Writer
Gary Basham	Botanist
Kevin Carson	Silviculture
Dave Fehringer	Project Lead/Sale Layout
Dave Harman	Engineering
Dennis Hutchison	Soils
Dave Mathweg	Recreation/Visual resources
Steve Niles	Management Representative
Frank Oliver	Wildlife
Dale Pospisil	Timber Cruising
Don Scheleen	Cultural/Historical Resources
Alisa Spafford	Silviculture
Larry Standley	Hydrology/Water Resources
Erin Strange	Fisheries

III. Agencies, Organizations, and Individuals to be notified of the Availability of the EA/FONSI:

Doug Heiken, Oregon Natural Resources Council
Francis Eatherington , Umpqua Watersheds, Inc.
NOAA Fisheries
Oregon Department of Environmental Quality
Oregon Department of Fish and Wildlife
Robert Ragon, Executive Director Douglas Timber Operators
Ronald Yockim, Attorney for Douglas County Commissioners
U.S. Fish and Wildlife Service

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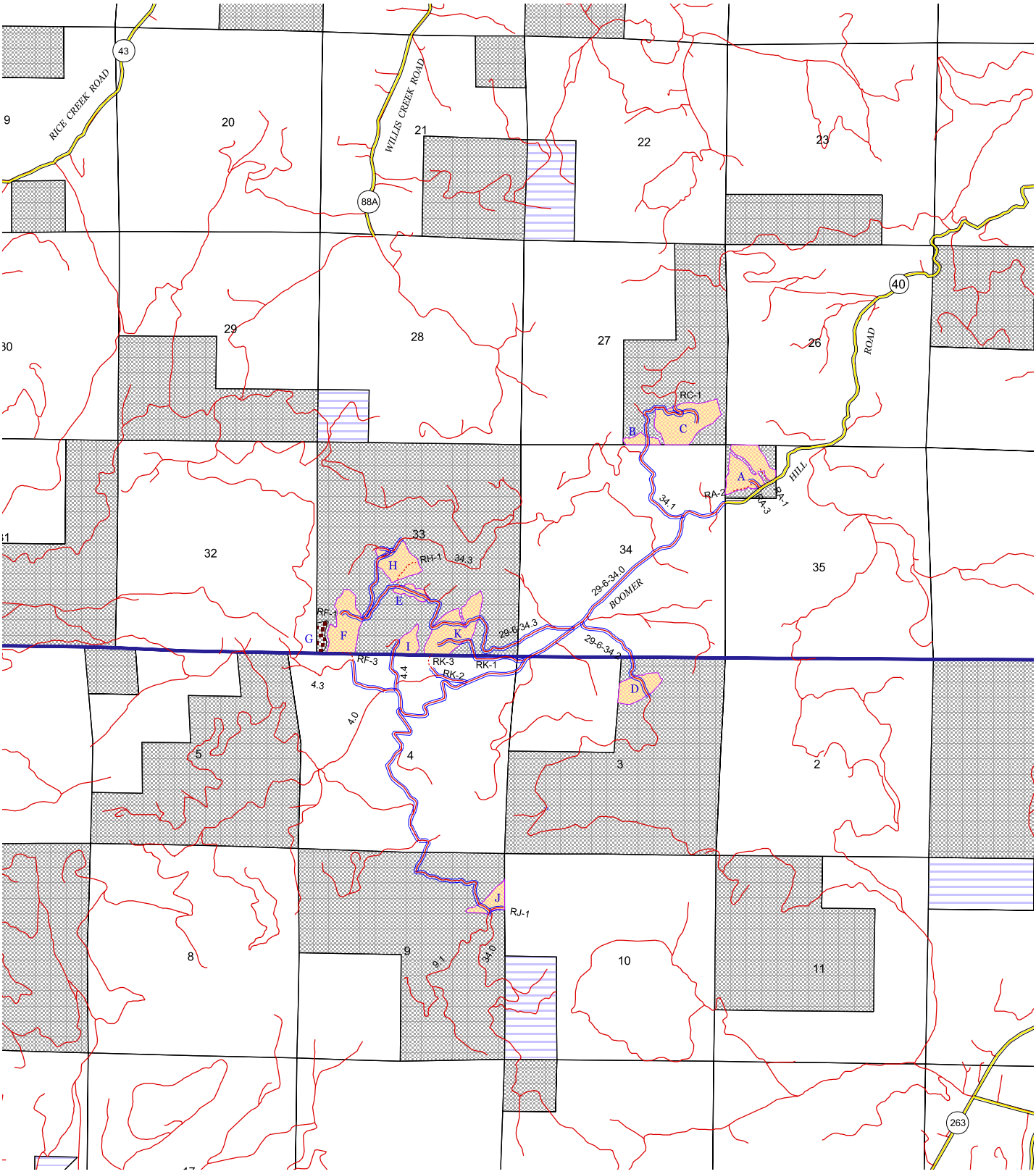
APPENDIX A

SALE AREAS AND UNIT MAPS OF THE PROPOSED ALTERNATIVE

BOOMERANG

Proposed Commercial Thinning



N
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T29,30S R6W

Willamette Meridian, Roseburg, OR.

0 1 Miles

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual or aggregate use with other data. Original data was compiled from various sources. This information may be updated without notification.

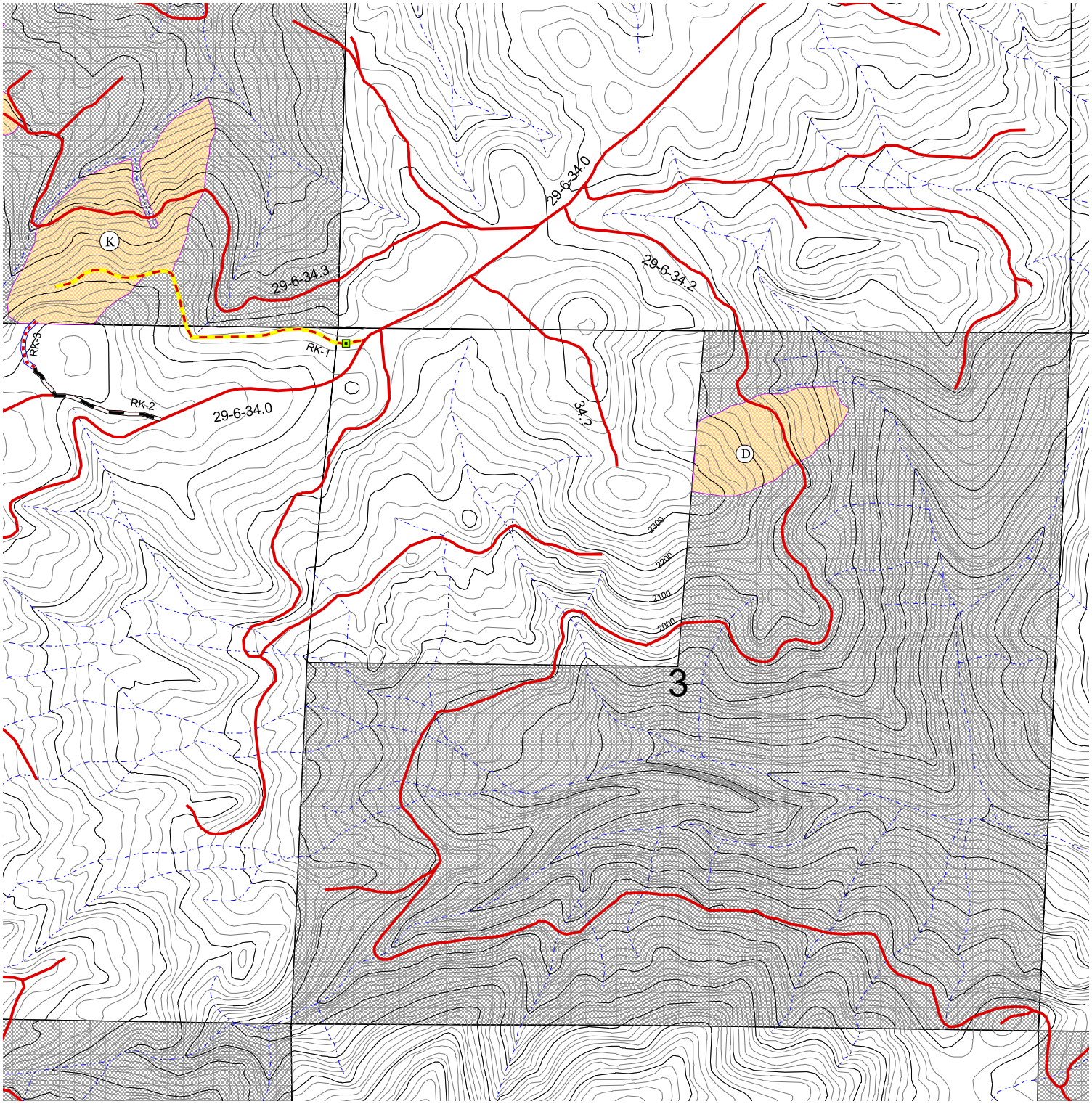
Road to be Constructed
County Road
Access/Haul Route
Existing Road

Thinning Area
Considered/Eliminated Area
O&C Land
PD Land
Private Land

2-13-2002

BOOMERANG

Proposed Commercial Thinning



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Willamette Meridian, Roseburg OR., BLM

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No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual or aggregate use with other data. Original data was compiled from various sources. This information may be updated without notification.

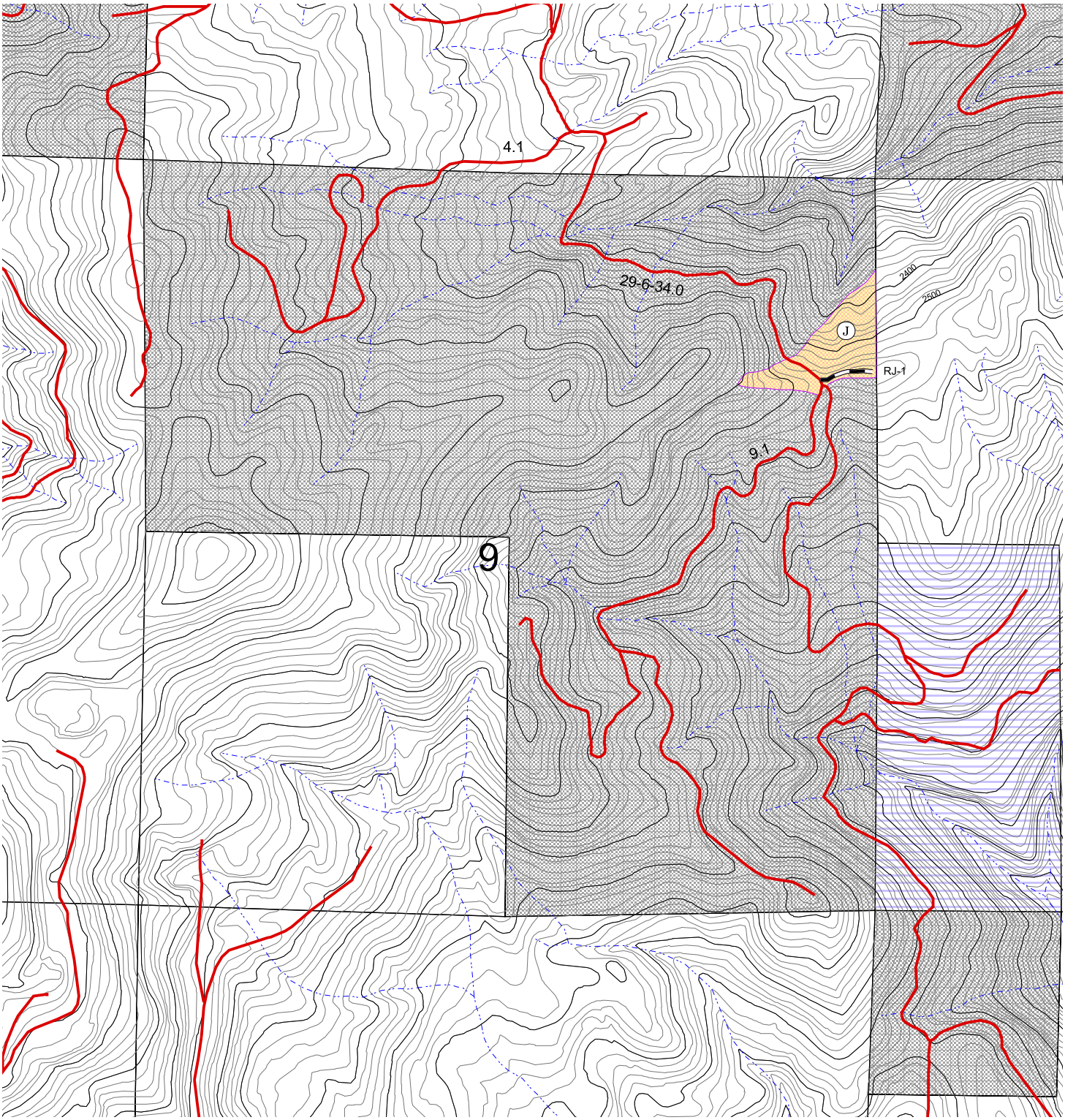
Construct Roadblock
Existing Road
Renovate, Decommission
Renovate, Permanent/Rock
Construct, Permanent/Rock
Stream
100' Contour
20' Contour

Thinning Area
O&C Land
Private Land

2-13-2002

BOOMERANG

Proposed Commercial Thinning



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Willamette Meridian, Roseburg OR., BLM

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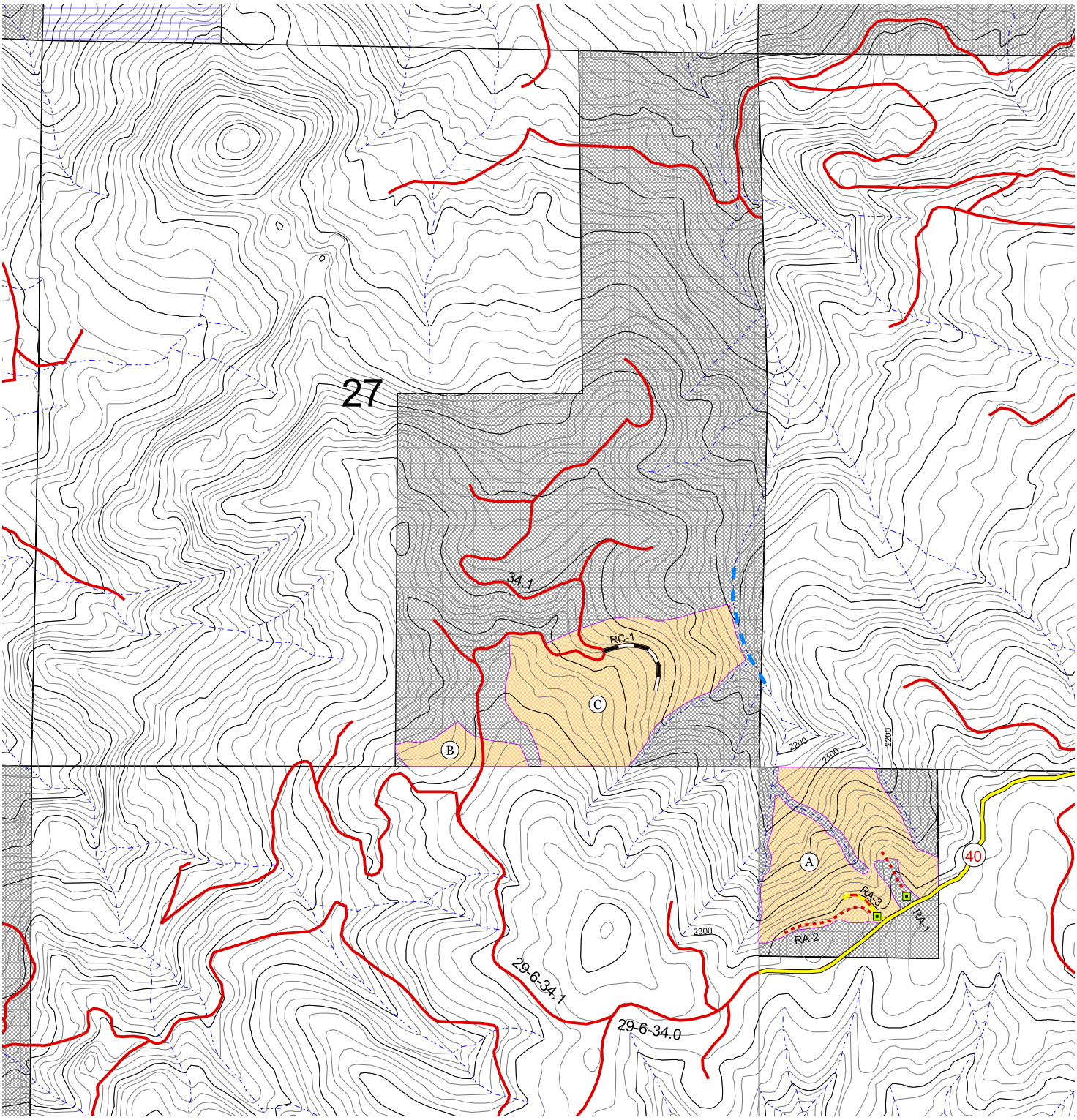
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual or aggregate use with other data. Original data was compiled from various sources. This information may be updated without notification.

Existing Road
Renovate, Permanent/Rock
Stream
100' Contour
20' Contour
Thinning Area
O&C Land
PD Land
Private Land

2-13-2002

BOOMERANG

Proposed Commercial Thinning



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Willamette Meridian, Roseburg OR., BLM

1000 0 1000 Feet

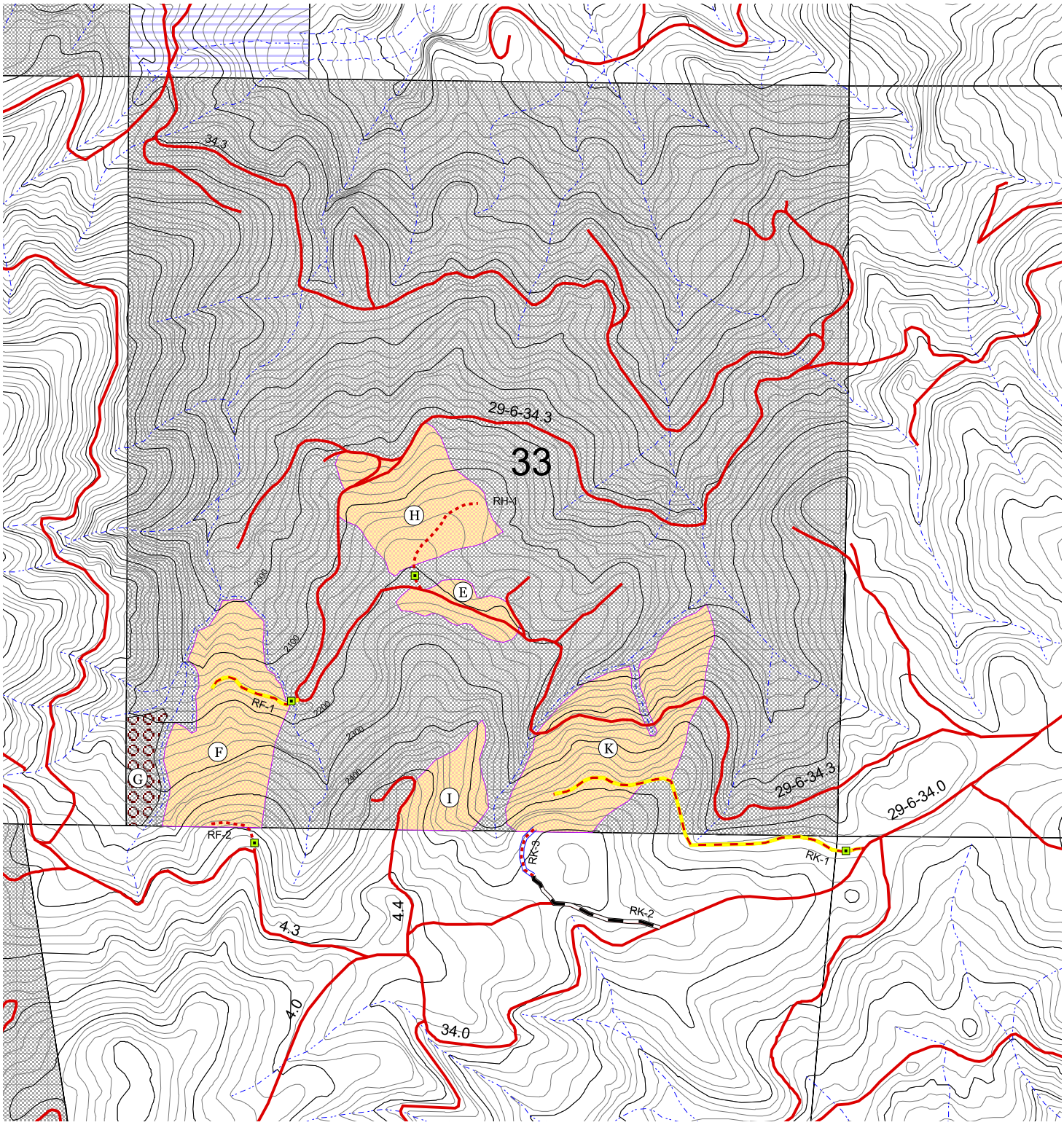
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual or aggregate use with other data. Original data was compiled from various sources. This information may be updated without notification.

Construct Roadblock
Paved Highway
Existing Road
Renovate, Decommission
Renovate, Permanent/Rock
Construct, Decommission
Stream
100' Contour
20' Contour
Thinning Area
O&C Land
PD Land
Private Land

2-13-2002

BOOMERANG

Proposed Commercial Thinning



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Willamette Meridian, Roseburg OR., BLM

1000 0 1000 Feet

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual or aggregate use with other data. Original data was compiled from various sources. This information may be updated without notification.

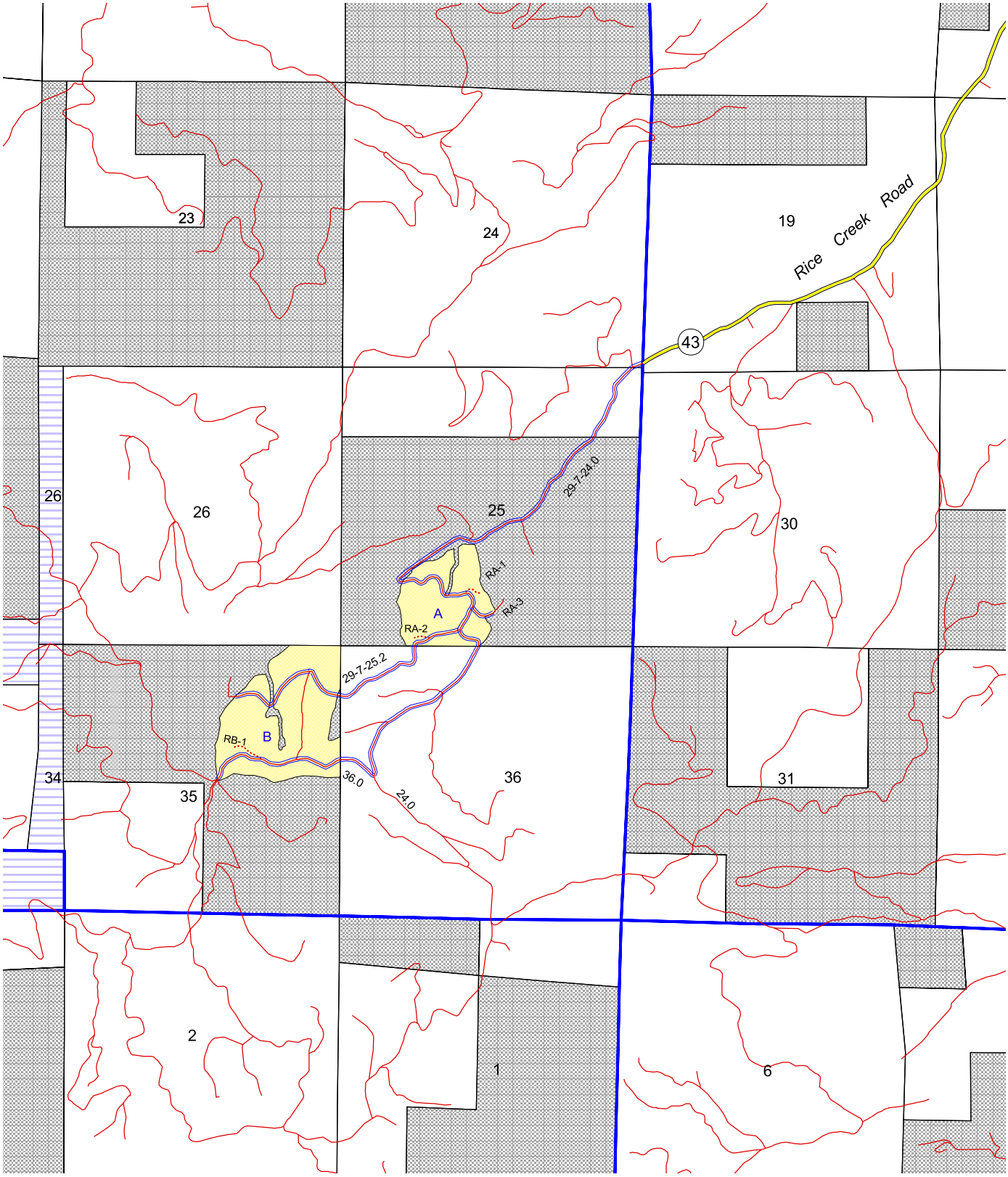
Construct Roadblock
Existing Road
Renovate, Decommission
Renovate, Permanent/Rock
Construct, Permanent/Rock
Construct, Decommission
Stream
100' Contour
20' Contour

Thinning Area
Considered / Eliminated
O&C Land
PD Land
Private Land

2-13-2002

RICE BOWL

Proposed Commercial Thinning



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T29S R7W

Willamette Meridian, Douglas Co., OR.

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No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual or aggregate use with other data. Original data was compiled from various sources. This information may be updated without notification.

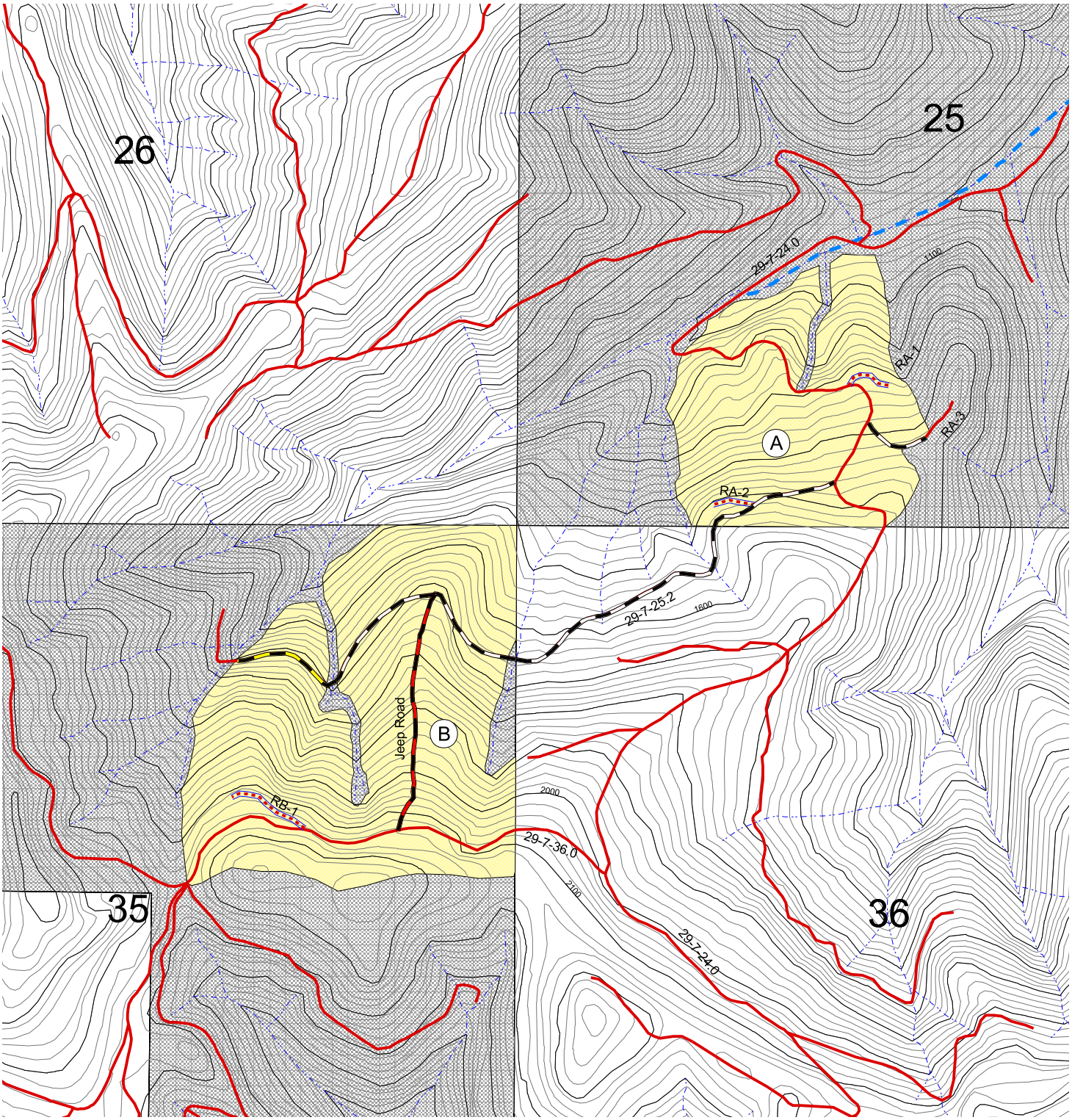
Road to be Constructed
County Road
Haul Route
Existing Road

Thinning Area
O&C Land
PD Land
Private Land

2-6-2003

RICE BOWL

Proposed Commercial Thinning



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Willamette Meridian, Douglas Co., OR.

1000 0 1000 Feet

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual or aggregate use with other data. Original data was compiled from various sources. This information may be updated without notification.

Existing Road
Decommission
Renovate, Rock
Renovate, Decommission
Construct, Permanent/Rock
Stream
Fish-Bearing Stream
100' Contour
20' Contour

Thinning Area
BLM (O&C) Land
Private Land

2-6-2003

TAYLOR MADE

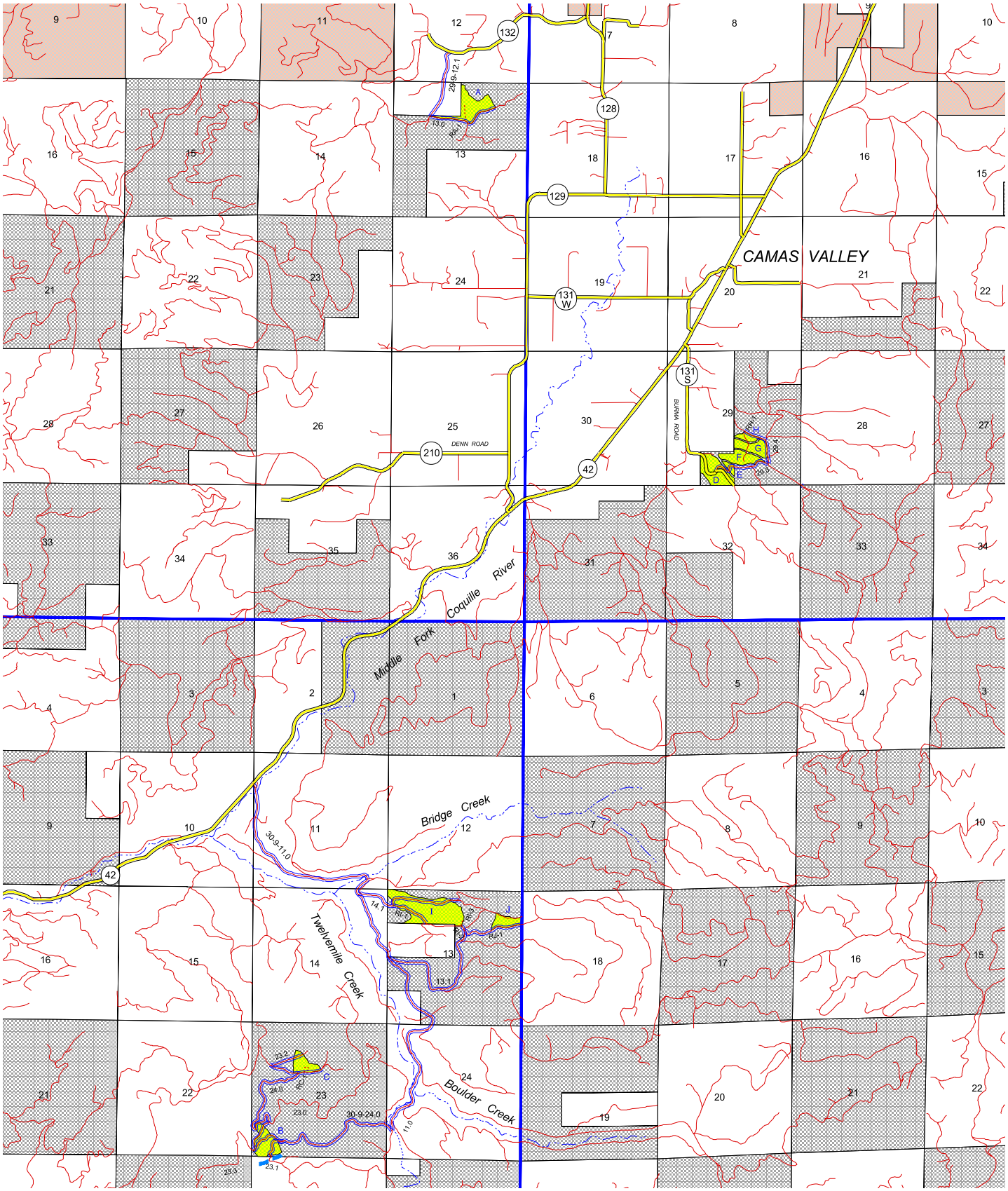
Proposed Commercial Thinning

R 9 W

R 8 W

T 29 S

T 30 S



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Willamette Meridian, Roseburg, OR.

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No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual or aggregate use with other data. Original data was compiled from various sources. This information may be updated without notification.

Thinning Area

BLM (O&C) Land

BLM (Coos Wagon Rd.) Land

Private Land

County Highway

Existing Road

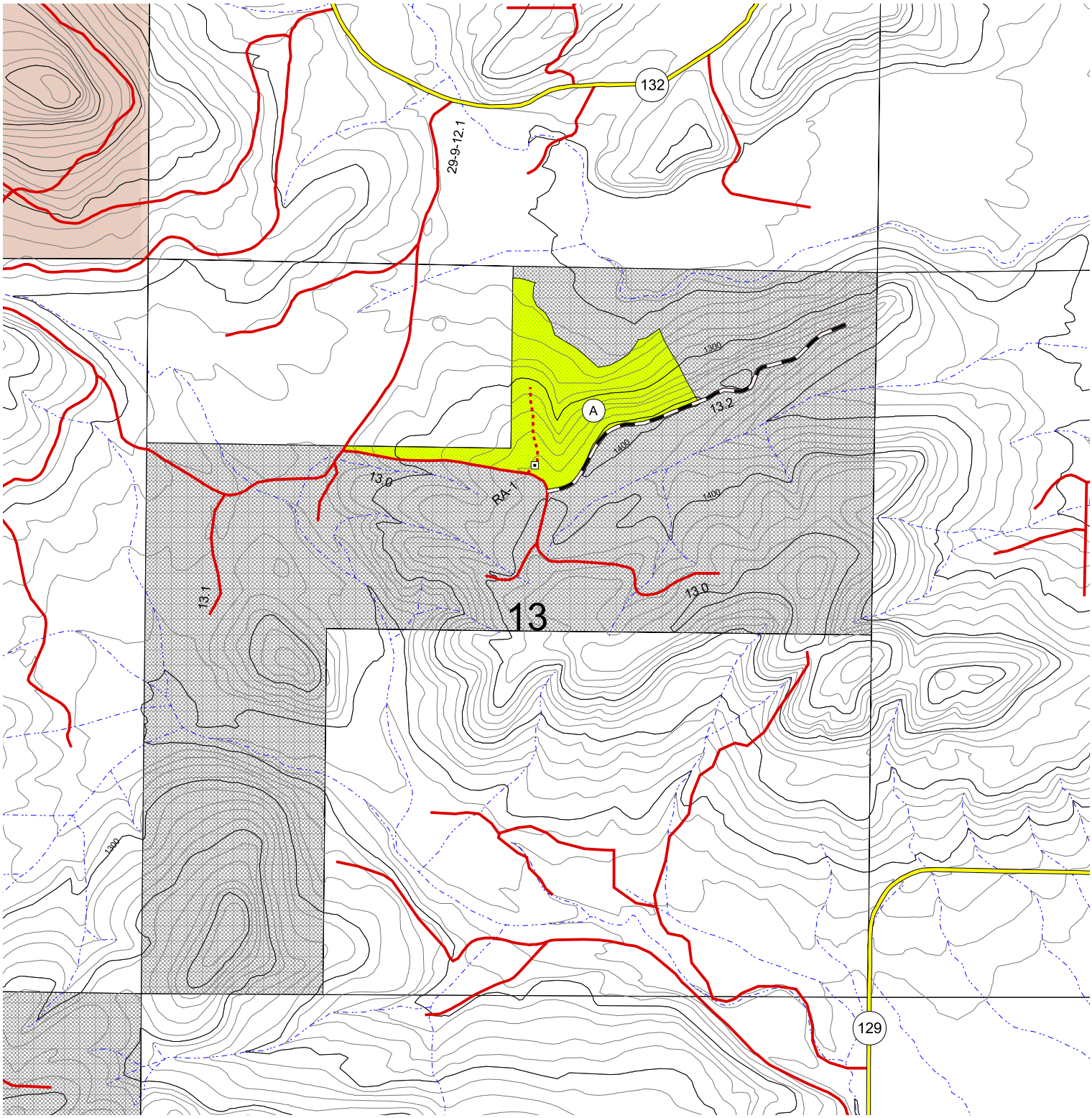
Access/Haul Route

Construct, Decommission

2-8-2002

TAYLOR MADE

Proposed Commercial Thinning



N
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T29S, R9W

Willamette Meridian, Roseburg, OR.

1000 0 1000 Feet

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual or aggregate use with other data. Original data was compiled from various sources. This information may be updated without notification.

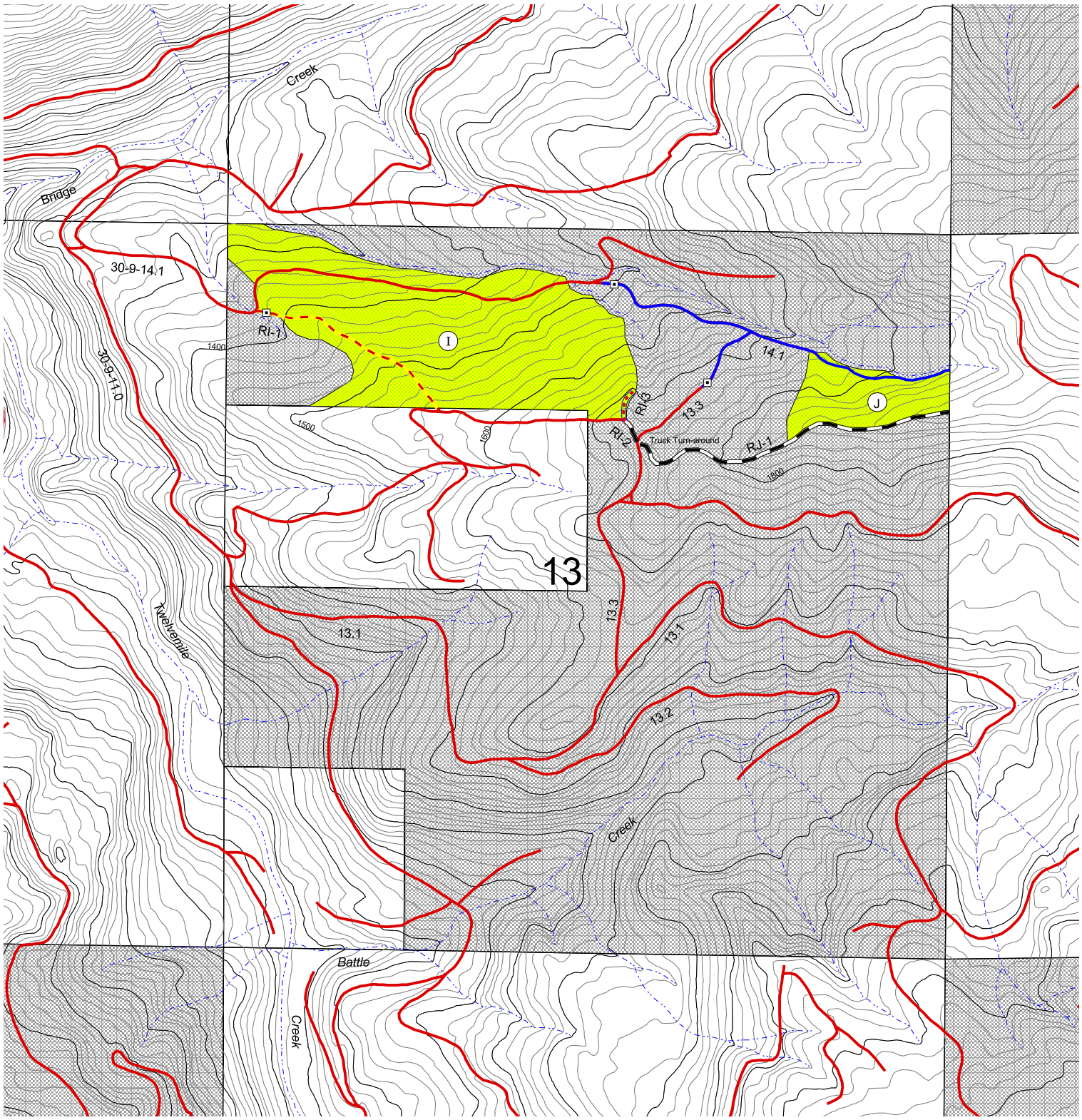
Thinning Area
BLM (Coos Wagon Rd.) Land
BLM (O&C) Land
Private Land

Roadblock
County Highway
Existing Road
Renovate, Rock
Construct, Decommission
100' Contour
20' Contour
Stream

2-14-2002

TAYLOR MADE

Proposed Commercial Thinning



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T30S, R9W

Willamette Meridian, Roseburg, OR.

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No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual or aggregate use with other data. Original data was compiled from various sources. This information may be updated without notification.

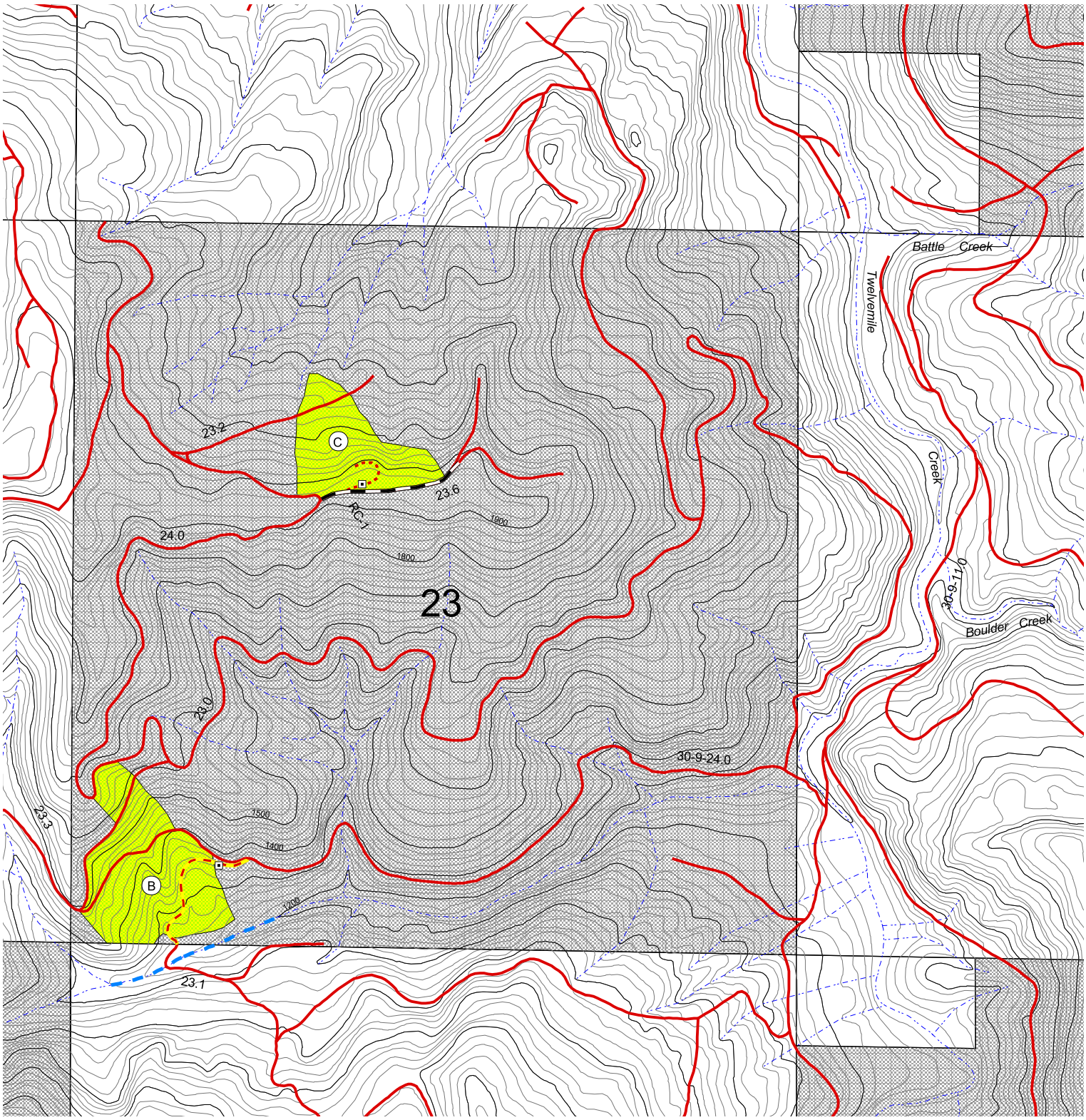
Thinning Area
BLM (O&C) Land
Private Land

Roadblock
Existing Road
Renovate, Permanent Rock
Construct, Permanent Rock
Decommission
Renovate, Decommission
100' Contour
20' Contour
Stream

2-14-2002

TAYLOR MADE

Proposed Commercial Thinning



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T30S, R9W

Willamette Meridian, Roseburg, OR.

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No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual or aggregate use with other data. Original data was compiled from various sources. This information may be updated without notification.

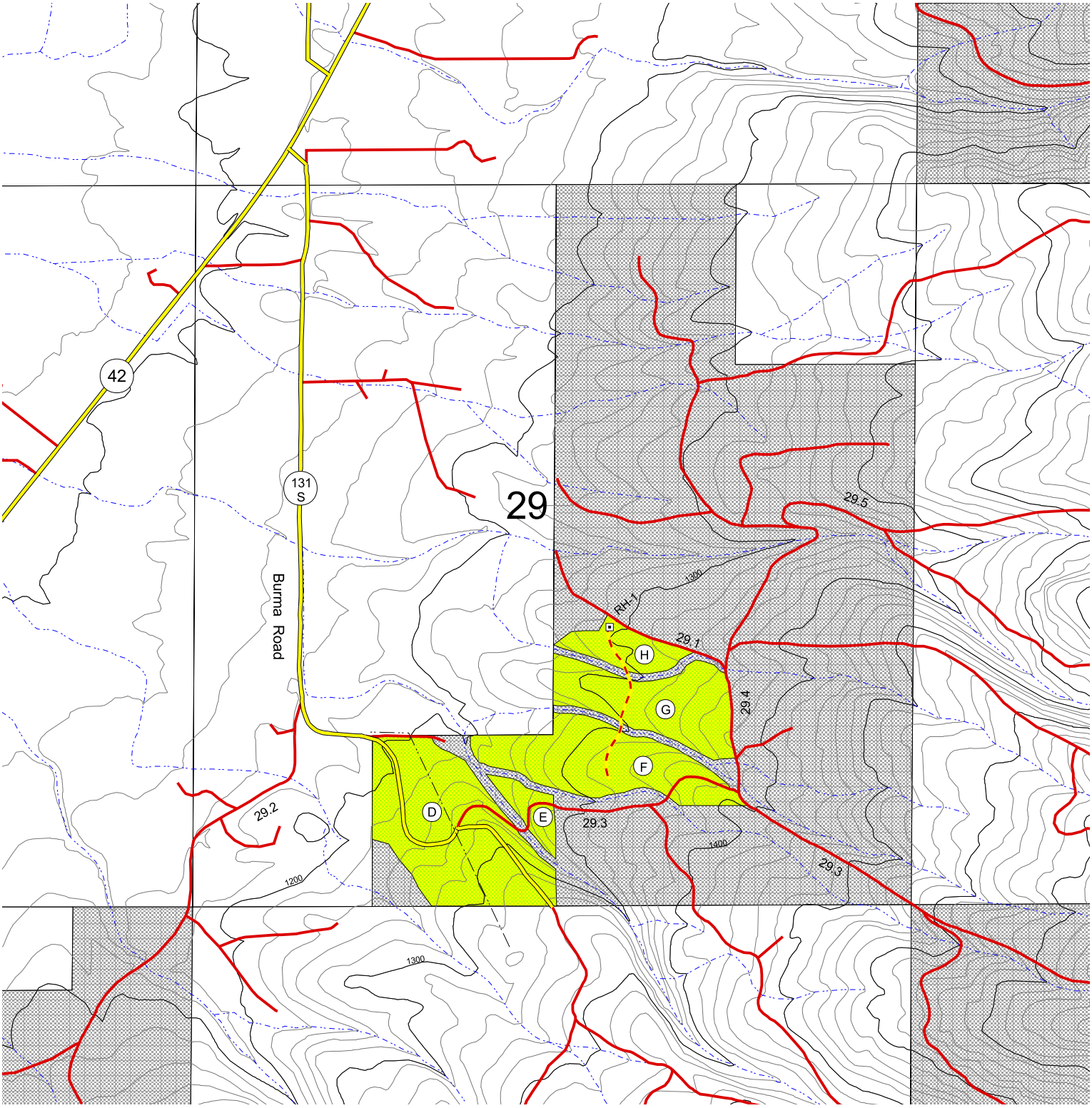
Thinning Area
BLM (O&C) Land
Private Land

Roadblock
Existing Road
Renovate, Decommission
Renovate, Rock
Construct, Decommission
100' Contour
20' Contour
Stream
Fish-Bearing Stream

2-14-2002

TAYLOR MADE

Proposed Commercial Thinning



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T29S, R8W

Willamette Meridian, Roseburg, OR.

1000 0 1000 Feet

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual or aggregate use with other data. Original data was compiled from various sources. This information may be updated without notification.

Thinning Area
BLM (O&C) Land
Private Land

Powerline R/W
Roadblock
County Highway
Existing Road
Renovate, Decommission
100' Contour
20' Contour
Stream

2-28-2002

APPENDIX B

CRITICAL ELEMENTS OF THE HUMAN ENVIRONMENT

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

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