# *South River Commercial Thinning 2003 Environmental Assessment*

South River Field Office
Roseburg District, Bureau of Land Management
EA # OR105-03-01

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 thinning units were identified through field reconnaissance, inventories and stand examinations. The candidate units were divided into three project areas, based on the proximity of proposed units to one another, and the most logical access routes. The project areas were assigned the names Shep Boyardee, Tater Tot, and Wasted Days in order to provide a point of reference and a basis for discussion of Affected Environment and Environmental Consequences.

The Shep Boyardee project area is in the Olalla Creek/Lookingglass watershed, with proposed units located in T. 29 S., R. 7 W., Section 31 and T. 29½ S., R. 7 W., Section 31.

The Tater Tot project area is in the Upper South Myrtle subwatershed of the Myrtle Creek watershed. Proposed units are located in T. 28 S., R. 2 W., Sections 31 and 32; T. 28 S., R. 3 W., Sections 35 and 36 and T. 29 S., R. 2 W., Sections 5 and 6.

The Wasted Days project area is in the South Umpqua watershed with proposed units in T. 29 S., R. 3 W., Sections 23, 25 and 35.

A summary of the recommendations for density management treatments in Riparian Reserves may be found in the Olalla-Lookingglass Watershed Analysis (USDI, BLM 1998 p. 103), the South Umpqua Watershed Analysis (USDI, BLM 2001 p. 209), and the Myrtle Creek Watershed Analysis and Water Quality Restoration Plan (USDI, BLM 2002a pp. 183-4).

*Purpose*

The proposal would commercially thin approximately 260 acres allocated to the General Forest Management Area (GFMA), and apply density management to another 46 acres allocated as Connectivity/Diversity Block. Density management would also be proposed for approximately 152 acres of Riparian Reserves, located within or immediately adjacent to proposed units.

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

Density management within Riparian Reserves should be considered in order to maintain or restore tree growth and vigor, reduce susceptibility to insect infestation, and to maintain or enhance current structural and vegetative diversity. Density management would hasten the growth of larger trees and shorten the period of time necessary for providing stream-side shading and large wood for recruitment into streams.

It is anticipated that the three sales, described above, would be offered in fiscal year 2004, yielding an estimated 5.2 million board feet (MMBF) or 9,360 hundred cubic feet (CCF) of timber 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 is not estimated and 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 alternatives and the alternative of no action in the short term and long term, at both the project level and the fifth-field analytical watershed level. It will evaluate the consistency of the alternatives 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 the Matrix is needed to reduce stand densities in order to: maintain stand health and vigor; provide a high level of quality wood and sustainable timber production from the GFMA; and provide moderately high levels of timber production from the Connectivity/Diversity Blocks.

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

The sales are needed to meet the annual District ASQ objective, and provide the socioeconomic benefits envisioned in the PRMP/EIS (Vol. 1, p. xii) which estimated that BLM management programs (including timber sales) would support 544 jobs and provide $9.333 million in personal income on an annual basis. Management direction 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 stipulate 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 incorporates the analysis contained in the *Roseburg District Proposed Resource Management Plan/Environmental Impact Statement* (USDI, BLM 1994). Both documents incorporate the analysis of the *Final Supplemental Environmental Impact Statement* (FSEIS) *on Management of Habitat for Late-Successional and Old-Growth Related Species Within the Range of the Northern Spotted Owl* (USDA, USDI 1994a). Management direction from the ROD/RMP incorporates the standards and guidelines of the *Record of Decision for Amendments* (ROD) *to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (USDA, USDI 1994b), otherwise known as the Northwest Forest Plan.

# Chapter 2
# DISCUSSION OF THE ALTERNATIVES

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

## I. Alternative One - No Action

No commercial thinning or density management would be conducted in the project areas. Stand development would continue along present trajectories. Stand densities would continue to increase, with increased suppression mortality and potential stand stagnation. Other stands in the Matrix would be analyzed for commercial thinning or regeneration harvest to meet the ASQ and socioeconomic objectives of the ROD/RMP and PRMP/EIS, and the management requirements of the O&C Act.

## II. Alternative Two - Proposed Action / Limited Winter Operations

To reduce current relative stand densities, commercial thinning and/or density management would be applied to dense, even-aged stands that are dominated by Douglas-fir. Relative density is a ratio that compares current stand density to a theoretical maximum. For an average tree diameter there are a maximum number of trees per acre that may be supported. Conversely, for a given number of trees per acre, there is a maximum average tree diameter. Relative density indicates how well a stand is growing and is a useful indicator in determining if stand conditions will support establishment and growth of an understory, and whether or not a stand is entering or experiencing a stage of mortality suppression.

GFMA stands would be thinned from below to a Relative Density Index (RDI) of approximately 0.30-0.35 in order to maximize growth of the remaining trees. Thinning would primarily remove trees from the suppressed and intermediate canopies. One-third to one-half of stand basal area would be removed and canopy closure would be reduced to between 45 and 60 percent.

Density management in Connectivity/Diversity Blocks would be conducted in a similar manner, but RDI would be reduced to approximately 0.25. This would remove 40 to 50 percent of the basal area and reduce canopy closure to between 40 and 50 percent. A second entry into Connectivity/Diversity Block stands would be anticipated in 15-20 years when RDI returns to approximately 0.45. This second entry, in conjunction with conifer under-planting, would help create a secondary canopy layer in conjunction with understory vegetation.

In the Matrix allocations, marking would be based on an average spacing that would generally be consistent across most of the units. The best-formed dominant and co-dominant trees would be selected for retention, reflecting the conifer composition of the stands. Trees would have at least a 30 percent live crown ratio so release in response to thinning would be more likely (Daniel, et. al. 1979). In the Tater Tot project area where many western hemlock are infested with dwarf mistletoe, retention of non-host species such as grand fir and Douglas-fir would be favored.

In Connectivity/Diversity Blocks, hardwood species would also be selected for retention to meet future objectives for stand structure and species composition that include an average of two large hardwoods per acre following regeneration harvest (ROD/RMP, p. 152). Trees selected would be at least 10 inches in diameter at breast height (dbh) and exhibit a reasonable likelihood of surviving thinning operations.

Density management in Riparian Reserves would be designed to develop structural diversity that includes understory vegetation and a multi-layered canopy. A variable density prescription would be used based on a desired basal area and number of trees per acre. This would help to create a mosaic of thinned areas interspersed with clumps of trees and canopy gaps. Gaps would be no larger than one-tenth of an acre and occupy no more than 10 percent of the area of any Riparian Reserve. RDI would be reduced to approximately 0.25-0.30 with a canopy closure of approximately 40 percent. Hardwoods and conifer trees with broken or deformed tops would be included in the selection of retention trees to foster species and structural diversity.

To protect stream bank integrity, maintain streamside shade and provide a filtering strip for overland run-off, variable width "no-harvest" buffers of at least 20 feet in width would be established within the Riparian Reserves. Buffers could be substantially wider, subject to on-site conditions that would include: unique habitat features; topography; and stream-side vegetation. The nature of the stream, intermittent vs. perennial, whether or not it is fish-bearing or is in proximity to Essential Fish Habitat would also be considered. Specific widths would be identified on the ground by fisheries and hydrology personnel.

Timber cruising would be accomplished using techniques that could include the felling of sample trees in upland stands to formulate local volume tables. Felled trees would become 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). No sample trees would be felled in Riparian Reserves.

Older trees scattered across the stands that predate the predominantly younger stands would be retained to the greatest degree practicable. Scenarios under which they might be designated for cutting would be limited to instances where they are located in a proposed road right-of-way where there is no other suitable or reasonable access, or in an area needed for a landing.

Decay Class 3, 4 and 5 down woody debris 16 inches or larger in diameter and 16 feet or greater in length would be reserved under contract provisions irrespective of land use allocation.

Conifer and hardwood snags would be felled where: they pose safety concerns; are in a road right-of-way with no suitable or reasonable alternative access; or where retention would preclude operations and project objectives. Otherwise, hard snags 16 inches or larger in dbh would be marked for retention where there is a reasonable likelihood that they would survive thinning operations. In some instances, snags would be buffered by rub trees in the Matrix allocations or enclosed by untreated areas within Riparian Reserves to increase the likelihood of survival.

All landing slash would be piled. Landing piles would be burned in the winter months.

Based on current road conditions, with respect to surfacing and drainage function, operations would be largely restricted to the summer operating season. Opportunities for wet season operations would be restricted to units accessible from paved roads. These would consist of approximately 35 acres, consisting of Unit C and the portion of Unit B in the Tater Tot project area that are located below BLM Road No. 28-3-35.0.

Tables 1-3 summarize the projects by unit, acreage, anticipated harvest method and seasonal operating restrictions. Units identified as available for harvest in any season, and subject to dry season restrictions, reflect the likelihood that a combination of ground-based and cable harvest systems would be used.

**Table 1 - Summary of Proposed Shep Boyardee Thinning / Alternative Two**

| Unit | Approximate Acreage | Estimated Riparian Acreage | Yarding Method (Estimated Percentage by Type) | | Operational Season | |
|---|---|---|---|---|---|---|
| | | | Cable | Ground-Based | Dry Season | Any Season |
| A | 61 | 21 | 35 | 65 | X | |
| B | 12 | 7 | | 100 | X | |
| C | 39 | 14 | 75 | 25 | X | |
| D | 34 | 1 | 70 | 30 | X | |
| E | 14 | 13 | 100 | | X | |
| **Total** | **160** | **56** | | | | |

**Table 2 - Summary of Proposed Tater Tot Thinning / Alternative Two**

| Unit | Approximate Acreage | Estimated Riparian Acreage | Yarding Method (Estimated Percentage by Type) | | Operational Season | |
|---|---|---|---|---|---|---|
| | | | Cable | Ground-Based | Dry Season | Any Season |
| A | 10 | 5 | | 100 | X | |
| B | 52 | 22 | 100 | | X | X |
| C | 10 | 5 | 100 | | | X |
| D | 21 | 0 | 40 | 60 | X | |
| E | 2 | 2 | | 100 | X | |
| F | 14 | 14 | | 100 | X | |
| G | 7 | 4 | 100 | | X | |
| H | 3 | 2 | | 100 | X | |
| I | 11 | 0 | | 100 | X | |
| J | 8 | 0 | | 100 | X | |
| K | 7 | 4 | 100 | | X | |
| L | 26 | 4 | 70 | 30 | X | |
| M | 9 | 6 | 60 | 40 | X | |
| **Total** | **180** | **68** | | | | |

**Table 3 - Summary of Proposed Wasted Days Thinning / Alternative Two**

| Unit | Approximate Acreage | Estimated Riparian Acreage | Yarding Method (Estimated Percentage by Type) | | Operational Season | |
|---|---|---|---|---|---|---|
| | | | Cable | Ground-Based | Dry Season | Any Season |
| A | 15 | 6 | 70 | 30 | X | |
| B | 15 | 4 | 100 | | X | |
| C | 26 | 5 | 85 | 15 | X | |
| D | 3 | 0 | 50 | 50 | X | |
| E | 22 | 2 | 80 | 20 | X | |
| F | 21 | 6 | 100 | | X | |
| G | 16 | 5 | 100 | | X | |
| **Total** | **118** | **28** | | | | |

Cable yarding equipment would have the capability of maintaining a minimum of one-end log suspension in order to reduce soil disturbance. Lateral yarding capability of at least 100 feet would be required so that yarding corridors would be spaced at intervals of 200 feet, whenever practicable. This would reduce the number of yarding corridors required and reduce the number of reserved trees cut to clear yarding roads and landing areas, as well as limit the area subject to potential soil disturbance.

Ground-based operations would be restricted to the period between May 15th and the onset of autumn rains, usually around mid-October. If conditions warrant, fall operations could be extended subject to a provisional waiver.

Primary skid trails, those with mineral soil exposed on 50 percent or more of the trail, and landings would collectively 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 primary and secondary skid trails would be done where recommended by silviculture and soils staff. Any skid trails not treated would be mapped and documented for treatment at regeneration harvest.

Additional restrictions may also apply during the bark slip period, from April 15th to July 15th , when active cambial growth results in bark being less firmly attached to boles and more susceptible to mechanical damage, particularly in younger trees. Timber felling and yarding for right-of-way clearing would be allowed. Timber felling and yarding in 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.

Existing permanent roads would provide primary access to the units. These would be supplemented by limited construction of permanent roads and temporary roads, renovation of non-system roads (i.e. jeep roads and skid roads), or temporary reopening of previously decommissioned roads in the Shep Boyardee and Tater Tot project areas.

Temporary roads would be planned for construction, use and decommissioning in the same operating season. If these roads could not be utilized in that time frame because of events such as extended fire closure, the BLM would winterize the roads, at its discretion, and allow their use the following year. In either event, the intent would be to decommission them after use.

Renovated roads that are not surfaced would be treated in the same fashion as temporary roads, subject to the provision that if they could not be decommissioned because of third-party access rights, they would be blocked to prevent vehicular use and reopened in the future if needed.

Table 4 summarizes proposed road construction and renovation. Roads are identified as they appear on the maps of the proposal, found in Appendix A. Actual road totals are only estimated as individual segment lengths would be subject to final layout.

**Table 4 – Summary of Proposed Road Work / Alternative Two**

| Project Area / Unit | New Construction | | Renovation | |
|---|---|---|---|---|
| | Permanent | Temporary | Surfaced System Roads | Unsurfaced Non-System Roads |
| Shep Boyardee | | | | |
| A | | RA-3, RA-4 | | RA-1, RA-2 |
| C | | RC-2, RC-3<br>RC-4 | | RC-1 |
| D | | | | 30-7-8.0* |
| E | | | | RE-1, RE-2 |
| Estimated Total Miles | 0.00 | 0.31 | 0.00 | 1.66 |
| Tater Tot | | | | |
| A | | | | RA-1 |
| B | RB-2 | RB-3, RB-4 | | RB-1 |
| C | | | RC-1 | |
| D | | RD-2 | | RD-1 |
| G | | | | 28-3-35.1* |
| K | | RK-1 | | |
| L | | | | RL-1 |
| M | | | | RM-1 |
| Estimated Total Miles | 0.04 | 0.27 | 0.05 | 1.50 |
| Wasted Days | | | | |
| A | | RA-1, RA-2 | | |
| B | | RB-1, RB-2 | | |
| C | | RC-1 | | |
| D | | RD-1 | | |
| E | | RE-1 | | |
| Main Haul Roads | | | 29-3-23.1<br>29-3-23.3 | |
| Estimated Total Miles | 0.00 | 0.58 | 1.40 | 0.00 |

* Portion in Unit D previously decommissioned as mitigation on past timber sales. Not to be retained.

## III. Alternative Three – Proposed Action / Expanded Winter Operations

Under this alternative, additional acreage would be made available for winter operations by upgrading some main haul roads, including installation of additional cross-drain culverts and resurfacing. Some proposed spur roads and renovated non-system roads, unsurfaced under Alternative Two, would be surfaced and made permanent. In all other respects, the project design features described for Alternative Two would apply to Alternative Three.

**Table 5 – Summary of Proposed Road Work / Alternative Three**

| Project Area / Unit | New Construction - | | Renovation - | |
|---|---|---|---|---|
| | Permanent | Temporary | Surfaced System Roads | Unsurfaced Non-System Roads |
| Shep Boyardee | | | | |
| A | | RA-3, RA-4 | RA-2 | RA-1 |
| C | | RC-2, RC-3 RC-4 | | RC-1 |
| D | | | | 30-7-8.0* |
| E | | | RE-1, RE-2 | |
| Main Haul Roads | | | 30-7-6.0 (port.) 30-7-8.0 (port.) | |
| Estimated Total Miles | 0.00 | 0.17 | 4.20 | 1.10 |
| Tater Tot | | | | |
| A | | | | RA-1 |
| B | RB-2, RB-3 | RB-4 | | RB-1 |
| C | | | RC-1 | |
| D | | RD-2 | | RD-1 |
| G | | | | 28-3-35.1* |
| K | RK-1 | | | |
| L | | | RL-1 | |
| M | | | | RM-1 |
| Main Haul Roads | | | 29-2-4.0 (port.) 29-2-6.0 | |
| Estimated Total Miles | 0.11 | 0.20 | 2.93 | 1.45 |
| Wasted Days | | | | |
| A | | RA-1, RA-2 | | |
| B | | RB-1, RB-2 | | |
| C | RC-1 | | | |
| D | RD-1 | | | |
| E | RE-1 | | | |
| Main Haul Roads | | | 29-3.23.1, 29-3-23.3 29-3-27.0, 29-3-35.0, 29-3-35.2, 29-3-35.4 | |
| Estimated Total Miles | 0.29 | 0.29 | 8.89 | 0.00 |

* Portion in Unit D previously decommissioned as mitigation on past timber sales. Not to be retained.

Tables 6-8 reflect the changes in operating season associated with the additional road upgrades.

**Table 6 - Summary of Proposed Shep Boyardee Thinning / Alternative Three**

| Unit | Approximate Acreage | Estimated Riparian Acreage | Yarding Method (Estimated Percentage by Type) | | Operational Season | |
|---|---|---|---|---|---|---|
| | | | Cable | Ground-Based | Dry Season | Any Season |
| A | 61 | 21 | 35 | 65 | X | X |
| B | 12 | 7 | | 100 | X | |
| C | 39 | 14 | 75 | 25 | X | |
| D | 34 | 1 | 70 | 30 | X | |
| E | 14 | 13 | 100 | | | X |
| **Total** | **160** | **56** | | | | |

**Table 7 - Summary of Proposed Tater Tot Thinning / Alternative Three**

| Unit | Approximate Acreage | Estimated Riparian Acreage | Yarding Method (Estimated Percentage by Type) | | Operational Season | |
|---|---|---|---|---|---|---|
| | | | Cable | Ground-Based | Dry Season | Any Season |
| A | 10 | 5 | | 100 | X | |
| B | 52 | 22 | 100 | | X | X |
| C | 10 | 5 | 100 | | | X |
| D | 21 | 0 | 40 | 60 | X | |
| E | 2 | 2 | | 100 | X | |
| F | 14 | 14 | | 100 | X | |
| G | 7 | 4 | 100 | | X | |
| H | 3 | 2 | | 100 | X | |
| I | 11 | 0 | | 100 | X | |
| J | 8 | 0 | | 100 | X | |
| K | 7 | 4 | 100 | | | X |
| L | 26 | 4 | 70 | 30 | X | X |
| M | 9 | 6 | 60 | 40 | X | X |
| **Total** | **180** | **68** | | | | |

**Table 8 - Summary of Proposed Wasted Days Thinning / Alternative Three**

| Unit | Approximate Acreage | Estimated Riparian Acreage | Yarding Method (Estimated Percentage by Type) | | Operational Season | |
|---|---|---|---|---|---|---|
| | | | Cable | Ground-Based | Dry Season | Any Season |
| A | 15 | 6 | 70 | 30 | X | |
| B | 15 | 4 | 100 | | X | |
| C | 26 | 5 | 85 | 15 | X | X |
| D | 3 | 0 | 50 | 50 | X | X |
| E | 22 | 2 | 80 | 20 | X | X |
| F | 21 | 6 | 100 | | | X |
| G | 16 | 5 | 100 | | | X |
| **Total** | **118** | **28** | | | | |

Under Alternative Three, 25 acres of the Shep Boyardee project area, an additional 32 acres of the Tater Tot project area, and 79 acres of the Wasted Days project area would be available for winter operations, compared to Alternative Two.

## IV. Alternatives Considered But Eliminated From Detailed Analysis

The following actions were considered but eliminated from detailed analysis because they were: adequately provided for by natural stand development and maturation; provided for in the project design; would not meet the purpose and need described in Chapter 1; or would be inconsistent with forest health and hazard reduction objectives.

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

Retention on site of all cut trees for density management within Riparian Reserves was not considered viable because of the following risks.

*Insects*

Research indicates that there is an increased risk of Douglas-fir beetle infestation when three or more trees per acre greater than 12 inches dbh are killed in a single year, though beetles may utilize trees as small as 8 inches dbh. Felled or girdled trees in full or partial shade would provide prime brood habitat from which new generations could infest and damage or kill other trees in the immediate or adjoining stands (Goheen 1996).

Outbreaks generally persist for four years, during which time beetles typically attack the larger trees in a stand, and on average, it would be expected that four live trees would be killed for every 10 felled or girdled trees. When selecting green trees, Douglas-fir beetles preferentially infest the larger trees. If beetle populations are large, all trees may be killed in pockets up to 2 acres in size. The beetles are strong fliers and 10-20 percent of the time will migrate after hatching and infest other stands at distances of 5 miles or more (Goheen 2001), posing unacceptable risk to other forest stands managed by Federal agencies, private timber companies, and individual property owners.

*Fire*

If all of the girdled or felled trees were retained on-site, fuel loading would be increased by 15 tons/acre or more. This would be in addition to limbs and tree tops dislodged from adjacent reserved trees and potential beetle kill.

It would be expected that 75 percent of this material would be fine fuels, less than 3 inches in diameter. These represent the ignition potential and the means by which larger fuels are ignited. They also have the greatest influence on the rate of fire spread. The increased risk of ignition would persist for 1-3 years following the completion of individual thinning treatments.

The remainder would be large fuels, greater than 3 inches in diameter. These are primarily responsible for fire intensity and duration, and pose the greatest control problems. The increased risk would persist for 15-20 years until the material decays sufficiently. Alone, large fuels do not pose a high risk but when combined with large amounts of fine fuels they create an elevated risk of a stand replacement event,

inconsistent with management objectives for limiting wildfire size and maintaining long-term ecosystem function within the Riparian Reserves (ROD/RMP, p. 27).

### B. Retention of a Portion of the Trees Cut in Riparian Reserves

Comments have been previously received suggesting that a portion of the trees selected for cutting should be girdled or felled and retained on-site, rather than removed from the Riparian Reserves. A concern was expressed that the removal of all cut trees would create a deficiency of snags and large down wood.

Contract provisions would stipulate the reservation of all existing down wood in Decay Classes 3, 4 and 5. Snags felled for safety or operational reasons would be retained on site to supplement existing down wood. Tops of trees broken out during thinning operations, as well as natural events such as windthrow, snow break and suppression mortality would provide additional sources of down wood.

As previously described, existing snags would be reserved wherever practicable. The selection of trees for retention would include trees with broken tops or deformities that would provide future nesting structure. As with large down wood, it would be expected that mechanical damage and natural processes would supplement the range of sizes and types of snags available in both the short term and long term.

In either event, the larger and more dominant trees would be reserved and additional trees have been planned for retention, beyond the numbers recommended in the modeled prescriptions. If a post-treatment assessment identified deficiencies in down wood or snags, an ample numbers of larger trees would be available for girdling or felling in order to supplement large wood and snags in the short term, while normal stand development and maturation would meet these needs for the long term.

## V. Resources That Would Remain Unaffected by Any of the 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.

None of the alternatives would have any adverse energy impact. No commercially viable energy resources exist in the project area, nor any production, transmission rights-of-way or conservation facilities which would be affected.

# Chapter 3
# AFFECTED ENVIRONMENT

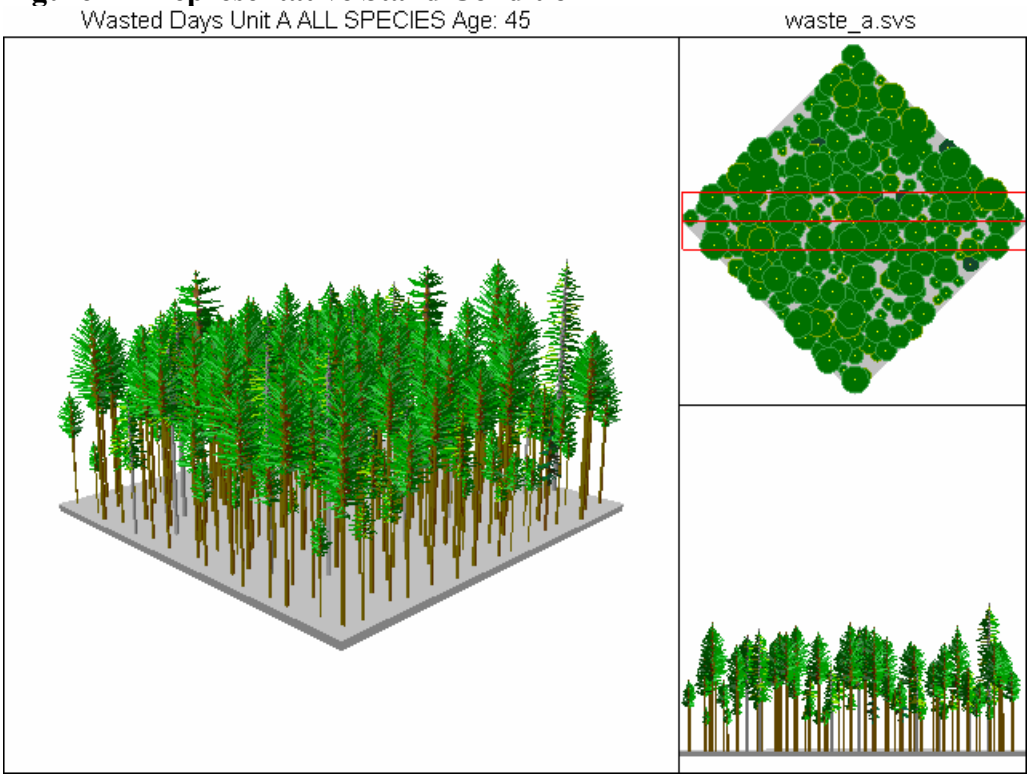
This chapter summarizes the specific resources present or potentially present within the area, which could be affected by the proposed action.

## I. Timber/Vegetation

The stands range in age from approximately 40-to-80-years old. Approximately 58 percent of the total acreage proposed for treatment is the result of natural regeneration following some disturbance other than timber harvest. The remaining acreage consists of areas reforested following a previous harvest entry. Roughly 80 percent of all of the selected stands have been actively managed and were pre-commercially thinned and fertilized. The notable exceptions being are the north half of Unit A in the Shep Boyardee project area and roughly two-thirds of the Tater Tot project area.

Unit A of the Wasted Days project was selected as generally representative of stand conditions. Stand exam data was modeled using Organon version 6.0, for Southwest Oregon and has been depicted (Figure 1) using Stand Visualization System version 3.31 (SVS).

**Figure 1 – Representative Stand Condition**



Douglas-fir is the dominant conifer species. Other conifers include incense-cedar, western redcedar, western hemlock, grand fir, ponderosa pine, and sugar pine. No Port-Orford-cedar is present in the project areas or along proposed haul routes. In general, crown ratios are still above 30 percent, a level important for maintaining or increasing stand health and vigor. Hardwoods are few, consisting of Pacific madrone, golden chinkapin, red alder, and bigleaf maple.

Common understory shrubs are rhododendron, vine maple, evergreen huckleberry, ocean spray, hazel, and species of manzanita. Herbaceous vegetation is generally sparse and is primarily composed of Oregon-grape, salal, and sword fern.

Unit A in the Shep Boyardee project area is composed of two distinctly different stands. The south half is approximately 40-years-old and was pre-commercially thinned and fertilized. The north half is about 80-years-old. Past management focused on eradicating Pacific madrone.

Dwarf mistletoe is common on western hemlock in proposed Units B, C, D, and L in the Tater Tot project area. Western hemlock accounts for approximately one-third of the trees in Unit D, and also contains substantial blowdown and snow damage from the winter storms of 1995-96.

Individual stand conditions tend to be homogenous across upland areas and Riparian Reserves. Tables 9-11 summarize approximate stand conditions as modeled by Organon.

**Table 9 - Current Stand Conditions of Shep Boyardee**

| Unit | Stand Age | Trees per Acre | Basal Area in sq. ft. | Quadratic Mean Diameter in inches | Relative Density Index | Percent Canopy Closure | Average Crown Ratio |
|---|---|---|---|---|---|---|---|
| A | 41 / 81 | 272 / 269 | 180 / 260 | 11.0 / 13.3 | 0.60 / 0.80 | 96 / 100 | 0.42 / 0.34 |
| B | 39 | 267 | 160 | 10.5 | 0.54 | 74 | 0.52 |
| C | 39 | 298 | 197 | 11.0 | 0.66 | 91 | 0.47 |
| D | 41 | 173 | 178 | 13.8 | 0.54 | 96 | 0.57 |
| E | 46 | 201 | 187 | 13.1 | 0.58 | 88 | 0.38 |

**Table 10 – Current Stand Conditions for Tater Tot**

| Unit | Stand Age | Trees per Acre | Basal Area in sq. ft. | Quadratic Mean Diameter in inches | Relative Density Index | Percent Canopy Closure | Average Crown Ratio |
|---|---|---|---|---|---|---|---|
| A | 52 | 297 | 192 | 10.9 | 0.64 | 82 | 0.40 |
| B & C | 56 | 297 | 190 | 10.8 | 0.64 | 88 | 0.40 |
| D | 69 | 365 | 160 | 9.0 | 0.58 | 78 | 0.44 |
| E & F | 52 | 313 | 227 | 11.5 | 0.74 | 100 | 0.31 |
| G | 57 | 341 | 195 | 10.2 | 0.67 | 98 | 0.48 |
| H, I & J | 79 | 272 | 223 | 12.3 | 0.71 | 91 | 0.28 |
| K | 56 | 220 | 223 | 13.6 | 0.68 | 96 | 0.51 |
| L | 46 | 291 | 212 | 11.6 | 0.69 | 96 | 0.51 |
| M (above Rd) | 52 | 297 | 192 | 10.9 | 0.64 | 82 | 0.40 |
| M (below Rd) | 56 | 220 | 223 | 13.6 | 0.68 | 96 | 0.51 |

**Table 11 – Current Stand Conditions of Wasted Days**

| Unit | Stand Age | Trees per Acre | Basal Area in sq. ft. | Quadratic Mean Diameter in inches | Relative Density Index | Percent Canopy Closure | Average Crown Ratio |
|---|---|---|---|---|---|---|---|
| A | 45 | 222 | 163 | 11.6 | 0.53 | 89 | 0.43 |
| B | 44 | 276 | 143 | 9.7 | 0.50 | 85 | 0.45 |
| C | 37 | 222 | 196 | 12.7 | 0.62 | 95 | 0.51 |
| D & E | 45 | 171 | 163 | 13.2 | 0.51 | 94 | 0.61 |
| F | 41 | 251 | 192 | 11.8 | 0.62 | 82 | 0.29 |
| G | 40 | 330 | 224 | 11.2 | 0.74 | 94 | 0.27 |

## 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. Assessment species 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 Species*

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

Annual surveys from 1977 to present (Isaacs and Anthony 2002) have not located any nesting bald eagles within the South River Resource Area. No proposed units are near large rivers or bodies of water, or contain trees suitable for nesting or roosting. Bald eagles would not be expected in the project areas, nor 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 to be present or affected, and will not be discussed further in this analysis.

Northern Spotted Owl

The northern spotted owl median home range for the Klamath Province is 3,340 acres (USDI, BLM 1990), generally represented by a circle, 1.3 miles in radius and centered on the nest site or activity center. There are 11 home ranges that overlap portions of the project areas.

Two home ranges overlap the Shep Boyardee project area. Occupancy was last documented on one site in 2000, while occupancy of the second was documented within the past year. Portions of proposed Units A and C are within 0.7-miles of an activity center, but not within ¼-mile.

Three home ranges overlap the Tater Tot project area. One home range is located to the east, primarily on U.S. Forest Service lands. Occupancy of this site and one other has not been documented since the mid-1990s. Occupancy on the third has been confirmed as recently as last year. Proposed Units K, L and M, and portions of A and D are within 0.7-miles of the occupied activity center.

Six home ranges overlap the Wasted Days project area with documented occupancy on all six as recently as last year. No proposed units are within 0.7-miles of an activity center.

Research in the late 1980s indicated greater owl abundance when at least 40 percent (≥ 1,336 acres) of a home range was composed of older forest habitat capable of providing nesting, roosting and foraging habitat. Analysis indicated that owl abundance was about four times greater under these conditions, then when compared to home ranges with less than 20 percent older forest habitat. (Anderson, D. R., et al. 1990) Current work also indicates that 40 percent is a habitat threshold below which spotted owl survival and productivity substantially decline (Anthony, R., et al. 2002).

Suitable nesting, roosting and foraging habitat, also referred to as "habitat one", is generally characterized by mature forest stands containing large conifers with broken and unbroken limbs of large diameter, bole or crown deformities, and large broken tops or cavities capable of providing nesting sites (Forsman 1984; Hershey 1995; Forsman and Giese 1997). On the Roseburg District, this type of habitat is typically native forest stands greater than 120-years-old.

Habitat that provides for foraging and roosting, but few nesting opportunities is referred to as "habitat 2." It is generally characterized by native forest 80-120 years old possess the potential to become "habitat one."

"Habitat three" is commonly referred to as dispersal habitat which is capable of becoming suitable habitat, over time. It is typically 40-80-years-old and provides for foraging and movement of owls across the landscape.

As indicated in Tables 9-11 (pp. 14-15), roughly 90 percent of the project stands would be characterized as "habitat three," and the remainder as "habitat two."

Marbled Murrelet

Only the Shep Boyardee project area is located within the 35-50 mile marbled murrelet management zone.

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

An assessment of habitat determined that suitable nesting habitat is present in Units A and D, and contiguous to D on the northeast and southwest sides.

*2. Proposed or Candidate Species*

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

*3. Bureau Sensitive Species*

One Bureau Sensitive species, the peregrine falcon (*Falco peregrinus*) is known to nest in and occupy an area in the Myrtle Creek watershed, within two miles of the Tater Tot project area.

## B. SEIS Special Attention Species

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.

Great gray owls (*Strix nebulosa*) may be found in forest types that include ponderosa pine, Douglas-fir and grand fir. 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. Portions of the Tater Tot and Wasted Days project areas are above 3,000 feet, but there are no meadows present. Pre-disturbance surveys are not required and the great gray owl will not be discussed further in this analysis.

Two species of mollusks, the Crater Lake tightcoil snail (*Pristoloma articum crateris*) and Chace sideband snail (*Monadenia chaceana*), have been identified as potential occupants of the project areas.

The Crater Lake tightcoil inhabits wet areas such as spring seeps, at elevations above 2,000 feet, in association with habitat features that include woody debris, mosses, and rushes. Suitable habitat has been identified in proposed Units F and K in the Tater Tot project area.

The Chace sideband snail occupies habitat similar to that utilized by the Oregon shoulderband snail (*Helminthoglypta hertleini*), a species recently removed from the Survey and Manage program following the 2002 Annual Species Review. This habitat is comprised of talus and rocky outcrops in conjunction with down wood, herbaceous cover and moist conditions. Potential habitat has been identified in proposed Units A, B and C in the Tater Tot project area.

There would be no direct effects to either mollusk species, in association with no action. In the event a decision is reached to implement one of the action alternatives, with respect to the Tater Tot project, species surveys would be conducted. Where located, the mollusks would be protected in accordance with management recommendations designed to maintain habitat conditions favorable for persistence of the population(s). As a consequence, no further discussion is necessary in this analysis.

## III. Fish and Essential Fish Habitat

### A. Aquatic Habitat Conditions

The description of aquatic habitat conditions is largely based on aquatic habitat surveys conducted by the Oregon Department of Fish and Wildlife (ODFW) between 1993 and 1996. The professional judgment of the fish biologist was used to assess conditions in stream reaches for which no survey data exists. Qualitative ratings are assigned to stream reaches based on percent pool area, residual pool depth, percent sand, percent gravel, percent shade, large woody debris (LWD) pieces, and LWD volume.

Reaches of Olalla Creek adjacent to or downstream of the **Shep Boyardee** project area are primarily located on rural residential and agricultural lands. These stream reaches were rated as either *fair* or *poor* (ODFW 1995). Components contributing to those ratings were low amounts of gravel in riffles, and few pieces and a low volume of LWD.

The **Tater** Tot project area is located in the upper reaches of South Myrtle Creek. Habitat conditions were assessed as *fair* or *poor* (ODFW 1994a) from its headwaters to its confluence with North Myrtle Creek. Factors contributing to the rating include few pieces and a low volume of LWD, and a high amount of silt and organics (i.e. fines) in riffle units. The Tater Hill land slide, located on South Myrtle Creek opposite the western most portion of the Tater Tot project area, is a naturally occurring land flow that is persistent source of sediment but also provides a continuous supply of LWD.

While the ODFW surveys indicate a deficiency of LWD in the project area, it should be noted that all of the proposed Tater Tot thinning units are of natural origin, but for L. In the absence of any timber management activities in this immediate area it would be more

appropriate to view the present levels of large wood as a reflection of natural dynamic processes and within the normal range of variability.

The **Wasted Days** project area is drained by Days Creek and Coffee Creek. Reaches of Days Creek adjacent to and downstream of the project area were rated *fair* or *poor* (ODFW 1994b) based on low percent pool area, and few pieces and low volume of LWD. This data does not reflect the effects of instream restoration conducted by the BLM in the summer of 2001, and scheduled for completion in the summer of 2003. This restoration work will result in the installation of approximately 90 log structures over a two-to-three mile portion of Days Creek, which will increase pool habitat and amount of LWD.

Five reaches of Coffee Creek were rated as *fair* or *poor*, based primarily on a low percentage of gravels, and few pieces and low volume of LWD. One reach closest to proposed thinning units received a rating of *good*, with a high percent of gravel, high number of LWD pieces and a high volume of LWD.

## B. Special Status Species

Salmonid species known to utilize streams or rivers in the project areas include the Oregon Coast coho salmon (*Oncorhynchus kisutch*), Oregon Coast steelhead trout (*O. mykiss*), Coastal cutthroat trout (*O. clarki clarki*), and chinook salmon (*O. tshawytscha*).

The National Marine Fisheries Service designated the Oregon Coast coho salmon Evolutionary Significant Unit (ESU) as threatened under the Endangered Species Act of 1973, as amended (Federal Register 1998a Vol. 63, No. 153). Critical habitat for the Oregon Coast coho salmon was designated (Federal Register 2000a Vol. 65, No. 32), but later rescinded on May 7, 2002.

The National Marine Fisheries Service reviewed the status of Oregon Coast steelhead trout ESU in 1998 and concluded that it did not warrant listing as threatened. It remains a candidate species, however (Federal Register, 1998b. Vol. 63, No. 53).

Status of the Coastal cutthroat trout, a Federal candidate species, is under review by the U.S. Fish and Wildlife Service. Cutthroat trout in the Umpqua River basin were previously considered a separate ESU and listed as endangered on September 13, 1996, with critical habitat designated on January 9, 1998. They were delisted because they were not a unique ESU, but part of the Coastal cutthroat trout ESU which did not merit listing (Federal Register. 1999. Vol. 64, No. 64). Jurisdiction was transferred to the U.S. Fish and Wildlife Service (Federal Register. 2000b. Vol. 65, No. 78).

Non-salmonid species of concern are the Pacific lamprey (*Lampetra tridentada*) and Umpqua chub (*Oregonichthys kalawatseti*) which are listed as Bureau Sensitive and considered state of Oregon sensitive-vulnerable species. Both are known to occur in the Umpqua River Basin but specific distribution in tributary streams is unknown.

## C. Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), in accordance with the Sustainable Fisheries Act of 1996 (Public Law 104-267) designated Essential Fish Habitat (EFH) for coho salmon (Federal Register. 2002. Vol. 67, No. 12). EFH is defined as ". . . those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." EFH for coho salmon is found in each of the 5th-field project watersheds, below natural barriers to anadromy.

## D. Fish Distribution

Limits of anadromous distribution are based on documented and historical information as well as natural or man-made barriers. Presence or absence of resident fish is based on the observations and professional judgment of BLM fisheries biologists, and fish surveys conducted by the Oregon Department of Fish and Wildlife. Table 12 summarizes the approximate distribution of anadromous and resident fish and the distance to EFH.

**Table 12 – Fish Distribution (Distances Approximate)**

| Sale | Distance to Resident Fish | Distance to coho and steelhead | Distance to coho EFH |
|---|---|---|---|
| Shep Boyardee | | | |
| A | 0.5 miles | 0.5 miles | 0.5 miles |
| B | 0.6 miles | 0.6 miles | 0.6 miles |
| C & D | 1.0 miles | 1.0 miles | 1.0 miles |
| E | 0.9 miles | 0.9 miles | 0.9 miles |
| Tater Tot | | | |
| A | Adjacent | 1.7 miles | 1.7 miles |
| B | Adjacent | 2.2 miles | 2.2 miles |
| C | Adjacent | 2.7 miles | 2.7 miles |
| D | 0.8 miles | 2.8 miles | 2.8 miles |
| E & F | Adjacent | Adjacent | Adjacent |
| G | Adjacent | 0.2 miles | 0.2 miles |
| H | Adjacent | 0.4 miles | 0.4 miles |
| I | Adjacent | 0.7 miles | 0.7 miles |
| J | Adjacent | 1.2 miles | 1.2 miles |
| K & M | 0.1 miles | 1.7 miles | 1.7 miles |
| L | 0.3 miles | 2.0 miles | 2.0 miles |
| Wasted Days | | | |
| A & B | Adjacent | Adjacent | Adjacent |
| C | 0.6 miles | 7.0 miles | 7.0 miles |
| D | 0.5 miles | 1.7 miles | 1.7 miles |
| E | 0.5 miles | 7.0 miles | 7.0 miles |
| F | 0.7 miles | 7.0 miles | 7.0 miles |
| G | 0.4 miles | 7.2 miles | 7.2 miles |

## IV. Water Quality/Resources

Table 13 identifies individual thinning units with respect to the watershed and drainage in which they are located, and a perspective of the project areas in comparison to the drainage areas.

**Table13 - Location of Units by Watershed and as a Percentage of Drainage Area**

| Watershed (5th field) | Drainage (7th field) | Drainage Acres* | Sale/Units | Sale Acres* | Percent of Drainage |
|---|---|---|---|---|---|
| South Umpqua | Upper Days | 5212 | Wasted Days/ A&B | 30 | 0.57 |
| | Middle Days | 3809 | Wasted Days/ D | 3 | 0.08 |
| | Middle Coffee | 2041 | Wasted Days/ C&E | 48 | 2.4 |
| | Upper Coffee | 3363 | Wasted Days/ F&G | 37 | 1.1 |
| Myrtle Creek | South Myrtle Headwaters | 3359 | Tater Tot/ A-M | 180 | 5.4 |
| Olalla/ Lookingglass | Bushnell Frontal | 4896 | Shep Boyardee/ A-E | 160 | 3.3 |

*Approximate values based on GIS data

*Stream Flow*

The project watersheds are located in the Southern Oregon Coastal Basin where the climate is characterized by cool, wet winters and warm, dry summers. Precipitation is principally in the form of rain with some snow likely at higher elevations in a normal year. The volume of stream flow closely parallels the precipitation pattern. Peak flows occur from November to March, and low stream flows occur from July to October. With the exception of South Myrtle Creek, Curtin Creek, Days Creek and Coffee Creek, perennial streams are small in size. Small 1st and 2nd order headwater streams are intermittent with no surface flow during the dry season.

*Peak Flows*

Potential increases in peak flows have been shown in association with timber harvest in the Transient Snow Zone (TSZ) and with roads.

The TSZ is located at elevations between 2,000 and 5,000 feet. Timber harvest creates openings where above normal snow pack may accumulate. When subjected to warm rain-on-snow events, this snow pack can melt rapidly resulting in higher than normal stream flows which can degrade stream function by eroding banks and scouring streambeds.

Approximately 35 acres or 22 percent of the Shep Boyardee project area is in the TSZ. For the Tater Tot and Wasted Days project areas, there are 162 acres or 90 percent, and 88 acres or 74 percent), respectively, in the TSZ.

The effect of past timber harvest on the current risk of peak flow enhancement was evaluated for each project drainage using a model recommended in the Oregon Watershed Assessment Manual (Watershed Professionals Network 1999. p. IV-11). The model is predicated on the risk of peak flow enhancement being proportional to the percent of land in a drainage located in the TSZ and the percent of this area with less than 30 percent crown closure. Analysis indicates that the majority of the lands in the TSZ, within the project drainages, have good canopy closure and that increases to peak flows are unlikely.

Roads may increase peak flows (Beschta 1978. Wemple et al. 1996) by extending the stream channel network. This can occur when road drainage systems concentrate run-off and deliver water directly into stream networks.

Primary roads in the **Shep Boyardee** project area, including Road Nos. 30-7-8.0 and 30-7-6.0, lack sufficient cross drains resulting in road segments several hundred feet in length draining directly into stream crossings. Road No. 30-7-6.0 also exhibits evidence of surface erosion. An old logging road (RC-1) in C drains directly into a draw and has created a stream channel where it is unlikely one existed prior to construction of the road.

Roads in the **Tater Tot** project area, including Road Nos. 28-3-35.0, 29-2-6.0 and 29-2-4.0 also lack sufficient cross drainage. Road RB-1 diverts drainage from a small seep directly down the road prism for about 50 feet.

Road No 29-3-27.0 accesses all of the proposed units in the **Wasted Days** project area, other than Unit A. Drainage deficiencies and problems are consistent with those described above. Concentrated drainage is partially responsible for creation of a large gully at the junction of Road Nos. 29-3-27.0 and 29-3-33.0 near Days Creek. Improper drainage has also created a large gully and debris flow in and above Unit B.

*Water Quality*

Water quality standards are determined for each water body by the Oregon Department of Environmental Quality (ODEQ). Water bodies not meeting these standards are placed on the states' 303(d) list as Water Quality Limited (ODEQ 1998).

Olalla Creek and South Myrtle Creek exceed **water temperature** standards. Elevated stream temperatures can be caused by a lack of stream shading because a reduction in shade increases the amount of solar radiation reaching the stream surface (Moore and Miner 1997). Streams in the project areas are well shaded, however, and not considered contributors to elevated water temperatures.

Olalla Creek is also listed for exceeding biological criteria standards. This is likely the result of agricultural run-off from the valley bottom, and not a result of timber management activities.

Days Creek is listed from its mouth to headwaters for **habitat modification**, reflecting a lack of large wood and low pool frequency. As noted on p. 19, the BLM has undertaken efforts to increase the amount of large wood and pool habitat by installing log structures in Days Creek.

There are no streams in any of the project areas that are listed as impaired by excess **fine sediment**. Observation of stream embeddedness and macroinvertebrate data collected by BLM personnel suggests, however, that some streams are likely to be impaired.

A BLM sampling site on Olalla Creek was judged to have 'moderate but clear impairment' based on ODEQ standards (USDI, BLM 2002b).

On South Myrtle Creek, approximately one-half mile downstream of the Tater Hill slide, conditions were judged to be 'slightly impaired' (USDI, BLM 2002a). The Tater Hill slide is a large, naturally occurring earthflow that delivers large quantities of sediment and wood debris into South Myrtle Creek.

Lower reaches of Days Creek were observed to have substantial amounts of fine sediment, but a sampling site two miles upstream of the Wasted Days project area was judged 'unimpaired' based on macroinvertebrate data (USDI, BLM 2001).

## V. Soils

Soil survey information was obtained from the National Cooperative Soil Survey conducted by the Natural Resource Conservation Service (NCRS), 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.

The primary soil series in the Shep Boyardee project area are Windygap and Bellpine, with Kanid and Atring also present in one of the proposed units on the steeper slopes. These soils are moderately deep to deep and well drained, with textures that are clayey to loamy.

Soil series in the Tater Tot project area include: Gustin; Illahee; Lempira; Mellowmoon; Orford; Scaredman; Sweetbriar; and Zing. All of these soils are moderately deep to deep. With the exception of Gustin, which is somewhat poorly drained, these soils are moderately well to well drained. Textures are predominantly loamy.

## VI. Vascular and Non-Vascular Plants

### A. Special Status Species

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

Kincaid's lupine (*Lupinus sulphureus* var. *kincaidii*), a Federally-threatened species, is known to occur in the South River Resource Area. A geographic range and an array of soil types have been identified by the U. S. Fish and Wildlife Service that is considered suitable habitat. These soil types are absent from the project areas, with the exception of that portion of the Wasted Days project area located in Section 23, T. 29 S., R. 3 W.

Other special status plants listed as Bureau Sensitive include:

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

## B. SEIS Special Attention Species

Based upon habitat conditions found in the three project areas, it is anticipated that the following species might occur:

**Vascular Plants**
*Botrychium minganesnse*

**Bryophytes**
*Schistostega pennata*
*Tetraphis geniculata*

**Lichens**
*Bryoria tortuosa*
*Hypogymnia duplicata*
*Lobaria linita*
*Pseudocyphellaria rainierensis*
*Ramalina thrausta*

None of the species identified above were located in the Tater Tot project area. Surveys in the Wasted Days project area located *Ramalina thrausta* at the bottom of Unit A on the far eastern edge of the unit. The Shep Boyardee project area will be surveyed in the Spring of 2004.

In the case of both Special Status and Special Attention species, no direct effects would result from an alternative of no action. In the event one of the action alternatives was implemented those species located in the Wasted Days project area, or which may be located in the Shep Boyardee project area would be protected in accordance with management recommendations designed to maintain habitat conditions favorable for persistence of the population(s), such that no direct effects would accrue. As a consequence, no further discussion of vascular and non-vascular plants is necessary in this analysis.

# VII. Air Quality/Rural Interface

Units A and B of the Shep Boyardee project area are located within one mile of lands zoned for 1-5 acre residential parcels, and are in the Wildland-Urban Interface within a mile of the Olalla Creek rural fire protection district. The area was rated as a moderate risk for human caused fires.

Portions of the Tater Tots and Wasted Days project areas were also assessed as a medium risk for human caused fires because of the proximity of some proposed units to the Days Creek Road (BLM Road No. 29-3-33.0) and the Upper South Myrtle Access Road.

No broadcast burning would be conducted in conjunction with any of the proposed thinnings. 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, 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

No catalogued historic or prehistoric sites are known to exist within any of the proposed thinning units, though records indicate sites in the general vicinity. These are all characterized as upland lithic scatters, with the exception of a large quarry site located east of the proposed Tater Tot project area. Field inventories were conducted on all proposed units covered by this assessment. No historic or prehistoric sites were identified. As a consequence, there would be no effect to cultural or historical resources, and no further discussion is necessary in this analysis.

## IX. Recreation/Visual Resources

There are no recreational developments in any of the project areas. Recreational use is of a dispersed nature, involving activities such as hunting, sightseeing, wildlife observation, and gathering of forest greenery and wild foods.

Lands in the project areas are predominantly VRM Class IV. In these areas, high levels of change are allowed on the visual landscape, which may attract the attention of the casual observer.

Much of the Tater Tot project area lies astride the South Myrtle Access Road (BLM Road No. 28-3-35.0). This road is regularly used by individuals recreating in the Red Top Pond area, to the east, and as a connection between Myrtle Creek and the Tiller area.

With the implementation of road signing during thinning operations and standard clean-up and landing disposal project completion, the effects to public safety and the visual landscape would be consistent with those addressed by the PRMP/EIS, and need not be discussed further in this analysis.

## 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. While localized reductions in weed populations may be affected, negligible changes in noxious weed populations are anticipated at a landscape level 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 One – 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 from the Matrix allocations, nor would it serve to maintain stand health and vigor. Absent density management within Riparian Reserves, there would be no diversification of species composition and habitat conditions for terrestrial and aquatic organisms. 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

In the absence of thinning, relative stand densities would continue to increase with a corresponding increase in suppression mortality among trees in the suppressed and intermediate crown classes. These stands would continue developing as even aged, single storied conifer stands until a disturbance alters the stand structure. Over time, canopies would remain closed and the crowns of individual trees would continue to recede, resulting in increased suppression and stagnated tree growth.

Live crown ratios of the overstory trees would continue to recede from the current levels to less than 30 percent, in most instances, with a corresponding decline in vigor and stagnation in growth. Closely spaced trees with small crowns have a reduced photosynthetic capacity which results in decreased diameter growth and diminished resistance to disease and insects. As trees increase in height with little increase in diameter, they become unstable and more susceptible to wind damage. (Oliver and Larson, 1996) The likelihood of a favorable response to any future thinning treatments would also decrease.

In the Connectivity/Diversity Block portions of the project areas this type of stand development would not meet resource objectives. Many of the habitat characteristics associated with late-successional and old-growth forests would be unattainable until a natural disturbance alters development. Formation of canopy gaps and stratification of the canopy into multiple layers would generally not occur. Overtopping and suppression of hardwoods would continue, resulting in gradual elimination from the stands.

SW Organon version 6.0 was used to project stand growth out to 150-years-of-age for Connectivity/Diversity Blocks and Culmination of Mean Annual Increment (CMAI) for other land use allocations, in the absence of any silvicultural treatments.

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 are summarized in Tables 14-16.

**Table 14-Stand Conditions for Shep Boyardee at Rotation if Untreated**

| Unit | Age at Rotation (CMAI or 150 years) | Trees per Acre | Basal Area (sq. ft.) | Quadratic Mean Diameter (inches) | Relative Density Index | Percent Crown Closure | Average Crown Ration |
|---|---|---|---|---|---|---|---|
| A | 91 / 111 | 147 / 191 | 293 / 295 | 19.1 / 16.8 | 0.78 / 0.83 | 94 / 99 | 0.25 / 0.29 |
| B | 99 | 169 | 339 | 19.2 | 0.91 | 94 | 0.28 |
| C | 84 | 168 | 327 | 18.9 | 0.88 | 94 | 0.27 |
| D | 91 | 126 | 350 | 22.5 | 0.88 | 91 | 0.26 |
| E | 96 | 135 | 317 | 20.8 | 0.82 | 95 | 0.23 |

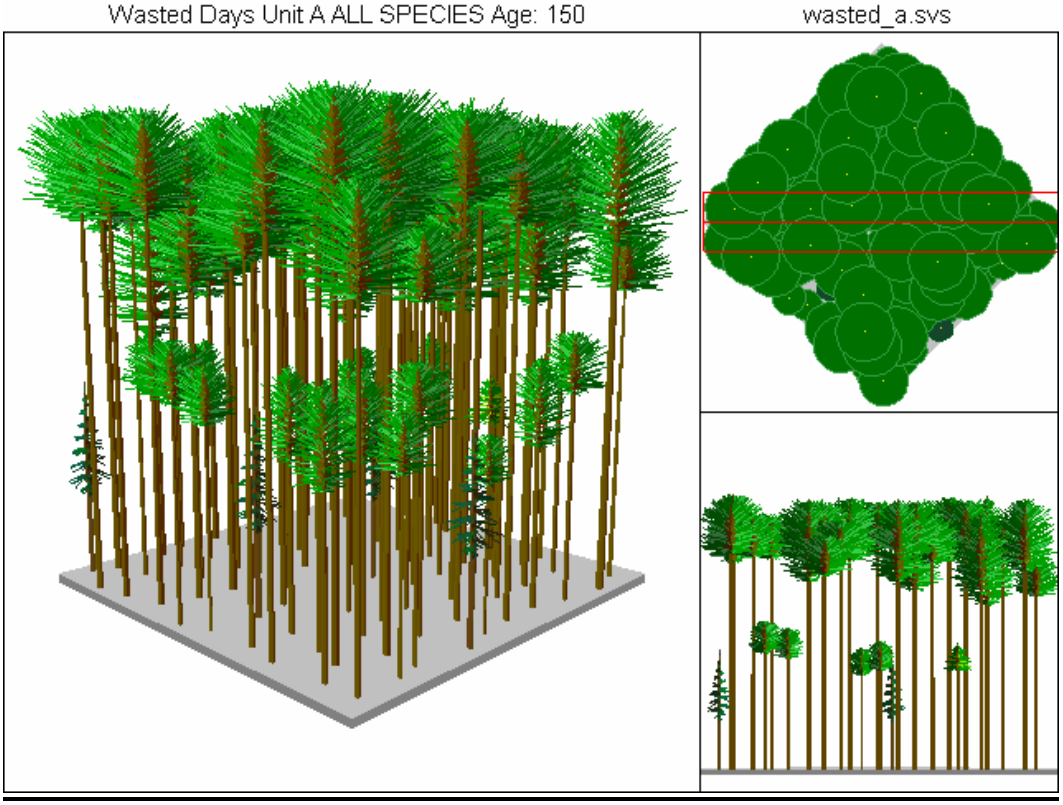
**Table 15- Stand Conditions for Tater Tot at Rotation if Untreated**

| Unit | Age at Rotation (CMAI or 150 years) | Trees per Acre | Basal Area (sq. ft.) | Quadratic Mean Diameter (inches) | Relative Density Index | Percent Crown Closure | Average Crown Ration |
|---|---|---|---|---|---|---|---|
| A | 127 | 144 | 352 | 21.2 | 0.91 | 93 | 0.30 |
| B & C | 116 | 160 | 312 | 18.9 | 0.84 | 95 | 0.31 |
| D | 129 | 243 | 258 | 14.0 | 0.78 | 100 | 0.44 |
| E & F | 107 | 133 | 321 | 21.1 | 0.83 | 91 | 0.23 |
| G | 132 | 158 | 371 | 20.8 | 0.96 | 94 | 0.29 |
| H, I & J | 119 | 166 | 261 | 17.0 | 0.73 | 99 | 0.25 |
| K | 151 | 114 | 423 | 26.1 | 1.00 | 100 | 0.41 |
| L | 91 | 220 | 348 | 17.0 | 0.98 | 100 | 0.42 |
| M (above rd) | 127 | 144 | 352 | 21.2 | 0.91 | 93 | 0.30 |
| M (below rd) | 151 | 114 | 423 | 26.1 | 1.00 | 100 | 0.41 |

**Table 16- Stand Conditions for Wasted Days at Rotation if Untreated**

| Unit | Age at Rotation (CMAI or 150 years) | Trees per Acre | Basal Area (sq. ft.) | Quadratic Mean Diameter (inches) | Relative Density Index | Percent Crown Closure | Average Crown Ration |
|---|---|---|---|---|---|---|---|
| A | 150 | 94 | 354 | 26.3 | 0.84 | 90 | 0.26 |
| B | 149 | 108 | 320 | 23.3 | 0.79 | 88 | 0.26 |
| C | 87 | 140 | 342 | 21.1 | 0.88 | 93 | 0.27 |
| D & E | 110 | 121 | 364 | 23.5 | 0.90 | 91 | 0.26 |
| F | 91 | 141 | 257 | 18.3 | 0.70 | 97 | 0.22 |
| G | 65 | 204 | 236 | 14.6 | 0.70 | 100 | 0.24 |

**Figure 2 - Future Stand Conditions at Age 150 Years If Left Untreated**




An objective for management of Riparian Reserves is the development of late-successional forest characteristics. Single-storied stands would not develop into multi-storied stands without altering the present growth and developmental trajectories.

Old-growth stands appear to have developed with low tree density, with the average density of large trees in old-growth stands being less than 50 trees per acre. Over time, stands regenerated with little competition between trees as disturbances, such as wildfire, of a magnitude sufficient to promote natural regeneration of conifers occurred. (Tappeiner, et.al., 1997) It is unlikely that the old stands initially had relative densities comparable to managed second-growth stands because growth rates were generally greater than the largest trees in young stands.

In the absence of disturbance, shade-tolerant species (i.e. grand fir, western redcedar) remain suppressed in the understory and there would be insufficient sunlight to allow conifer and hardwood regeneration. As snags deteriorate and fall, their numbers would decline. As large down wood decays, its availability would also decline. Suppression mortality would primarily occur in smaller trees and not provide a continuum of the larger material that would persist over time.

Failure to treat Riparian Reserves would result in the largest trees being at a distance from streams where there would be little potential for instream recruitment. Suppression and elimination of hardwoods from the Riparian Reserves would further simplify the vegetative composition of the stands, inconsistent with ACS objectives.

## B. Wildlife

Northern Spotted Owl

Under this alternative there would be no direct effects to the northern spotted owl. Stand conditions would remain relatively unchanged and continue to provide limited foraging opportunities function as well as dispersal habitat.

In the long term, GFMA stands would not be expected to provide suitable nesting habitat in the current rotation because these stands would be scheduled for regeneration harvest at approximate CMAI. Riparian Reserves and Connectivity/Diversity Blocks would continue to provide foraging and dispersal habitat. In the absence of density management, foraging quality would decline as hardwoods and understory vegetation that provide cover and forage for prey species die out under closed canopies. The growth and development of large trees and snags and stratified canopy indicative of late-successional forest and suitable habitat would be delayed by many decades.

Marbled Murrelet

Under this alternative, there would be no direct effect to any suitable murrelet nesting habitat that may exist in the Shep Boyardee project area because there would be no commercial thinning or density management which would modify current habitat conditions.

In the long term, absent thinning and density management, high relative densities would persist. As the older and larger trees that currently provide suitable nesting opportunities die out there would be a gradual but steady decline in the amount of nesting habitat. Among the younger stand components, closed canopy and competition between individual trees would result in natural limb pruning and recession of tree crowns. The future development of nest structure provided by lateral crown development and large limbs in the upper canopy would be severely retarded or entirely lost, resulting in further declines in available nesting.

## C. Fish and Essential Fish Habitat

Absent any management activities, there would be no direct affect 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.

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. This would result in simplified size and age class distributions, and stands dominated by smaller trees. This would be inconsistent with the objective of developing old-growth forest characteristics.

There would be insufficient large wood for the short and long term needs for habitat, stream structure and organic nutrients. Suppression mortality would occur primarily in smaller trees providing smaller diameter material which would not persist over time. The growth of large diameter trees for future recruitment would be delayed by decades.

Cumulative effects from management actions on private lands would continue to affect aquatic habitat and fish. Under requirements of the Oregon Forest Practices Act, it is assumed that there would be less retention of riparian vegetation and down wood on privately owned lands which would result in overall reductions, at the watershed levels, in large wood and quality habitat for priority fish species over the long term. (PRMP/EIS, Vol. 1, pg. 4-49).

## D. Water Quality/Resources

*Peak Flows and Annual Yield*

There would be no direct affect on the timing and magnitude of flows in the absence of any thinning or density management. Though not likely measurable, roads that would not be renovated or decommissioned would pose a continue risk for increasing peak flows based on their connection to the stream networks.

*Water Quality*

*Stream Temperature*

Streamside shade would not be directly affected. Tree growth would continue along a trajectory, though, that would lead to unfavorable height to diameter ratios and increase the risk of blow down (Smith 1962 p. 422) and exposure of streams to solar heating. Lack of thinning would delay establishment and growth of understory trees and shrubs whose canopy could provide shade in the event that some or all of the overstory is lost in a catastrophic event (Levno and Rothacher 1969 cited in Adams and Ringer 1994).

*Sediment*

There would be no potential for localized soil disturbance and sedimentation associated with felling and yarding, or road construction, renovation and decommissioning. Roads identified as sediment sources would not be renovated or decommissioned at this time and would continue to deliver fine sediment to streams.

*Large Wood*

Large wood is critical for reducing stream velocity, protecting banks from erosion and aggrading streams. Although tree growth in the Riparian Reserves would continue, the dense stands would grow at a slower rate. Analysis has shown that it could take up to an additional 40 years to grow trees that are 24 inches dbh to provide large wood.

### E. Soils

In the absence of any thinning and density management, there would be no direct effect on soils. Other Matrix stands would be analyzed for timber harvest where effects on soil such as compaction, displacement, and surface erosion would potentially occur.

Tilling to ameliorate compaction on existing skid trails and dirt haul roads would not be undertaken and ongoing erosion of natural-surface roads would continue, unless funded from other sources.

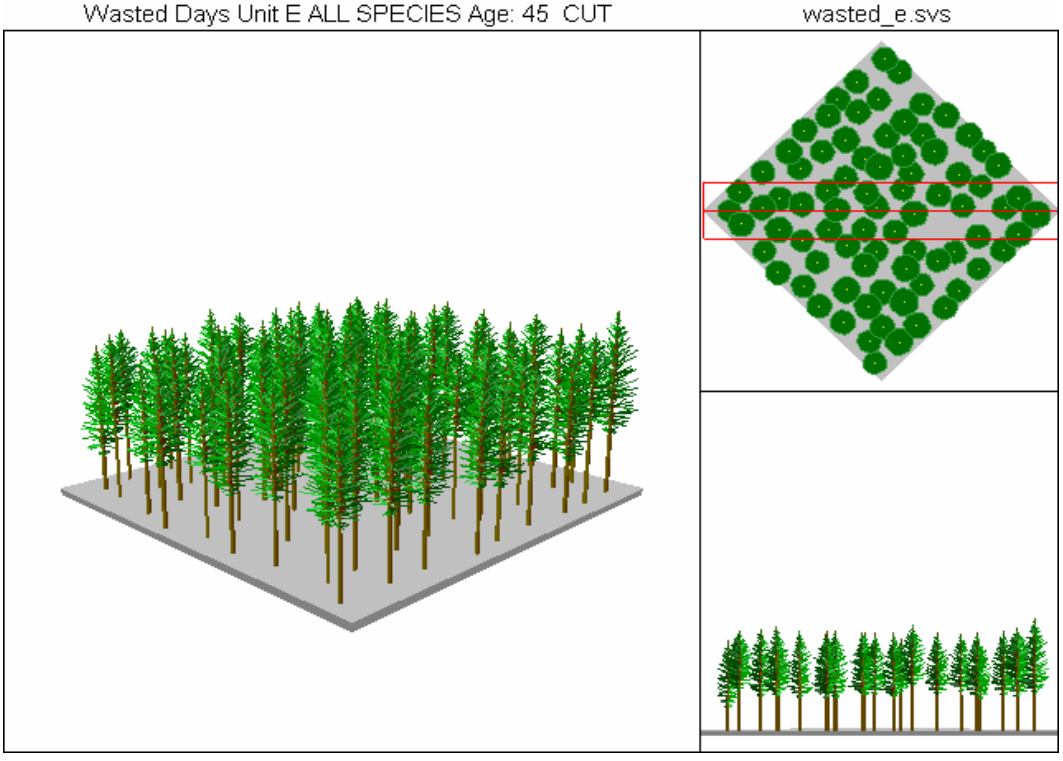
## II. Alternative Two – Proposed Action / Limited Winter Operations

This alternative would meet the objectives described in Chapter 1 (pp. 1-3). It would increase timber production from stands allocated to the Matrix, while maintaining health and vigor. Density management in the Riparian Reserves would increase species and habitat diversity, and accelerate development of late-successional forest conditions. It would also contribute toward the ASQ and socioeconomic objectives of the ROD/RMP and PRMP/EIS.

### A. Timber/Vegetation

All of the stands are approaching or exceed a relative density of 0.55 where competition between individual trees results in increased mortality and a reduction in tree vigor. (Drew & Flewelling, 1979) As noted in Chapter 2 (p. 4), up to one half of the basal area within GFMA stands would be removed and canopy closure reduced to 45-60 percent to promote diameter growth and crown development of the residual trees.

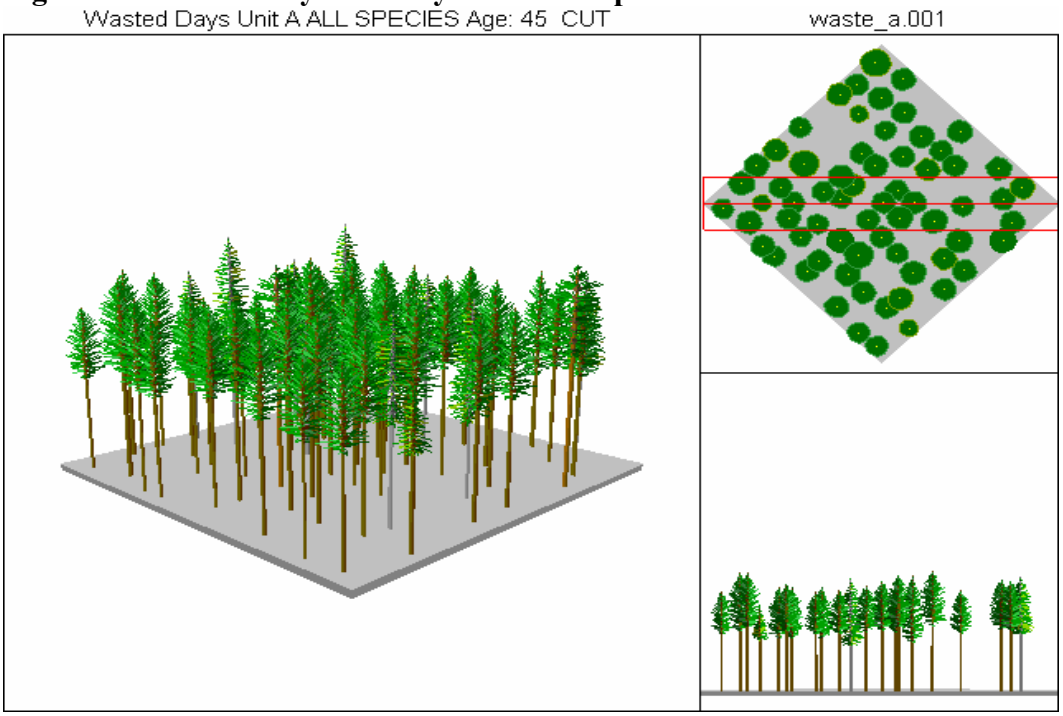
**Figure 3 - GFMA Stand Treatment**. *Thinning to 80 trees per acre and 55% crown closure.*



Reducing density to a range of 0.30 to 0.32 would maximize timber quality and yield, consistent with management direction to "Manage developing stands on available lands to promote tree survival and growth and to achieve a balance between wood volume production, quality of wood, and timber value at harvest." (ROD/RMP, p. 60)

Density management in the Connectivity/Diversity Block and Riparian Reserve allocations would be conducted in a similar fashion, but would reduce densities to about 0.25 and 0.25-0.30 respectively. In the Connectivity/Diversity Block allocation, thinning to a density of 0.25 or less, and thinning again when density approaches 0.45 would promote understory development and vertical diversity. (Hayes, et.al., 1997) Canopy closure would range from 40 to 50 percent, allowing sufficient sunlight to reach the forest to stimulate germination and growth of understory vegetation.

**Figure 4. Connectivity/Diversity Block or Riparian Reserve Stand Treatment**




Tables 17-19 summarize the anticipated post-treatment GFMA and Connectivity/Diversity Block stand conditions following thinning treatments.

**Table 17- Upland Stand Conditions for Shep Boyardee Post-Treatment**

| Unit | Trees per Acre | Basal Area (sq. ft.) | Quadratic Mean Diameter (inches) | Relative Density Index | Percent Crown Closure | Average Crown Ration |
|---|---|---|---|---|---|---|
| A | 98 / 49 | 100 / 130 | 13.7 / 22.0 | 0.31 / 0.33 | 54 / 46 | 0.50 / 0.41 |
| B | 106 | 100 | 13.2 | 0.31 | 45 | 0.56 |
| C | 87 | 100 | 14.5 | 0.30 | 50 | 0.57 |
| D | 82 | 110 | 15.7 | 0.32 | 60 | 0.62 |
| E | 84 | 110 | 15.5 | 0.32 | 51 | 0.41 |

**Table 18- Upland Stand Conditions for Tater Tot Post-Treatment**

| Unit | Trees per Acre | Basal Area (sq. ft.) | Quadratic Mean Diameter (inches) | Relative Density Index | Percent Crown Closure | Average Crown Ration |
|---|---|---|---|---|---|---|
| A | 84 | 120 | 16.2 | 0.34 | 45 | 0.41 |
| B & C | 82 | 110 | 15.7 | 0.32 | 44 | 0.41 |
| D | 160 | 90 | 10.3 | 0.31 | 42 | 0.43 |
| E & F | 71 | 130 | 18.4 | 0.35 | 49 | 0.37 |
| G | 85 | 110 | 15.4 | 0.32 | 51 | 0.32 |
| H, I & J | 69 | 110 | 17.1 | 0.31 | 46 | 0.37 |
| K | 57 | 110 | 18.9 | 0.29 | 44 | 0.55 |
| L | 77 | 110 | 16.2 | 0.31 | 49 | 0.58 |
| M (above rd) | 84 | 120 | 16.2 | 0.34 | 45 | 0.41 |
| M (below rd) | 57 | 110 | 18.9 | 0.29 | 44 | 0.55 |

**Table 19- Upland Stand Conditions for Wasted Days Post-Treatment**

| Unit | Trees per Acre | Basal Area (sq. ft.) | Quadratic Mean Diameter (inches) | Relative Density Index | Percent Crown Closure | Average Crown Ration |
|---|---|---|---|---|---|---|
| A | 65 | 90 | 15.9 | 0.26 | 45 | 0.49 |
| B | 75 | 80 | 14.0 | 0.24 | 43 | 0.47 |
| C | 81 | 110 | 15.8 | 0.32 | 56 | 0.59 |
| D & E | 80 | 110 | 15.8 | 0.32 | 62 | 0.64 |
| F | 97 | 110 | 14.4 | 0.33 | 47 | 0.34 |
| G | 99 | 110 | 14.3 | 0.33 | 47 | 0.33 |

It is projected that the combined timber yield from thinning and final regeneration harvest would average approximately 4,800 board feet per acre more than if the stands were not thinned prior to CMAI. Specific volume gains would vary by individual unit, reflecting the current growth conditions, stand stocking, and site potential.

In addition to increases in per acre timber yield, thinning to reduce stand density also increases the age at which a stand would reach CMAI. Table 20-22 summarize, and provide a comparison, of the conditions that would be expected if the thinned stands are grown out to the rotational ages found in Tables 14-16 on p. 28. The far right hand column of each table also shows the new age at CMAI for those stands allocated as GFMA. Rotational age for Connectivity/Diversity Block stands is still assumed at 150-years-of-age.

**Table 20- Upland Stand Conditions for Shep Boyardee at Rotation**

| Unit | Trees per Acre | Basal Area (sq. ft.) | Quadratic Mean Diameter (inches) | Relative Density Index | Percent Crown Closure | Average Crown Ration | New Age at Rotation or CMAI |
|---|---|---|---|---|---|---|---|
| A | 89 / 48 | 277 / 188 | 23.9 / 26.7 | 0.68 / 0.44 | 100 / 100 | 0.31 / 0.42 | 116 / 141 |
| B | 97 | 319 | 24.6 | 0.77 | 94 | 0.34 | 124 |
| C | 83 | 297 | 25.6 | 0.71 | 97 | 0.35 | 109 |
| D | 77 | 321 | 27.6 | 0.74 | 92 | 0.32 | 111 |
| E | 78 | 286 | 25.9 | 0.68 | 100 | 0.28 | 111 |

**Table 21- Upland Stand Conditions for Tater Tot at Rotation**

| Unit | Trees per Acre | Basal Area (sq. ft.) | Quadratic Mean Diameter (inches) | Relative Density Index | Percent Crown Closure | Average Crown Ration | New Age at Rotation or CMAI |
|---|---|---|---|---|---|---|---|
| A | 71 | 322 | 28.8 | 0.73 | 100 | 0.31 | 132 |
| B & C | 75 | 263 | 25.3 | 0.63 | 100 | 0.32 | 136 |
| D | 136 | 210 | 16.8 | 0.59 | 100 | 0.44 | 174 |
| E & F | 64 | 300 | 29.4 | 0.68 | 100 | 0.27 | 117 |
| G | 78 | 342 | 28.3 | 0.78 | 99 | 0.37 | 147 |
| H, I & J | 66 | 191 | 23.0 | 0.48 | 100 | 0.35 | 154 |
| K | 51 | 332 | 34.5 | 0.70 | 100 | 0.40 | 150 |
| L | 76 | 242 | 24.2 | 0.59 | 100 | 0.53 | 126 |
| M (above rd) | 71 | 322 | 28.8 | 0.73 | 100 | 0.31 | 132 |
| M (below rd) | 51 | 332 | 34.5 | 0.70 | 100 | 0.40 | 150 |

**Table 22- Upland Stand Conditions for Wasted Days at Rotation**

| Unit | Trees per Acre | Basal Area (sq. ft.) | Quadratic Mean Diameter (inches) | Relative Density Index | Percent Crown Closure | Average Crown Ration | New Age at Rotation or CMAI |
|---|---|---|---|---|---|---|---|
| A | 58 | 332 | 32.4 | 0.72 | 100 | 0.27 | 150 |
| B | 65 | 327 | 30.3 | 0.73 | 100 | 0.26 | 150 |
| C | 77 | 307 | 27.1 | 0.72 | 94 | 0.34 | 107 |
| D & E | 76 | 343 | 28.8 | 0.78 | 91 | 0.30 | 130 |
| F | 88 | 234 | 22.1 | 0.59 | 100 | 0.28 | 116 |
| G | 93 | 180 | 18.9 | 0.48 | 100 | 0.35 | 110 |

Tables 23-25 summarize the post-treatment conditions anticipated within the portions of the Riparian Reserves located outside of the "no-harvest" buffers.

**Table 23- Post-Treatment Riparian Reserve Conditions for Shep Boyardee**

| Unit | Trees per Acre | Basal Area (sq. ft.) | Quadratic Mean Diameter (inches) | Relative Density Index | Percent Crown Closure | Average Crown Ration |
|---|---|---|---|---|---|---|
| A | 73 | 80 | 14.1 | 0.24 | 44 | 0.52 |
| B | 106 | 100 | 13.2 | 0.31 | 45 | 0.56 |
| C | 76 | 90 | 14.7 | 0.27 | 45 | 0.58 |
| D | 64 | 90 | 16.1 | 0.26 | 50 | 0.63 |
| E | 65 | 90 | 15.9 | 0.26 | 42 | 0.42 |

**Table 24- Post-Treatment Riparian Reserve Conditions for Tater Tot**

| Unit | Trees per Acre | Basal Area (sq. ft.) | Quadratic Mean Diameter (inches) | Relative Density Index | Percent Crown Closure | Average Crown Ration |
|---|---|---|---|---|---|---|
| A | 71 | 110 | 16.8 | 0.31 | 40 | 0.41 |
| B & C | 72 | 100 | 16.0 | 0.29 | 41 | 0.42 |
| E & F | 56 | 110 | 19.0 | 0.30 | 41 | 0.38 |
| G | 71 | 100 | 16.0 | 0.29 | 45 | 0.61 |
| H | 59 | 100 | 17.6 | 0.28 | 41 | 0.38 |
| K | 57 | 110 | 18.9 | 0.29 | 44 | 0.55 |
| L | 66 | 100 | 16.7 | 0.28 | 44 | 0.59 |
| M (above rd) | 71 | 110 | 16.8 | 0.31 | 40 | 0.41 |
| M (below rd) | 57 | 110 | 18.9 | 0.29 | 44 | 0.55 |

**Table 25- Post-Treatment Riparian Reserve Conditions for Wasted Days**

| Unit | Trees per Acre | Basal Area (sq. ft.) | Quadratic Mean Diameter (inches) | Relative Density Index | Percent Crown Closure | Average Crown Ration |
|---|---|---|---|---|---|---|
| A | 65 | 90 | 15.9 | 0.26 | 45 | 0.49 |
| B | 75 | 80 | 14.0 | 0.24 | 43 | 0.47 |
| C | 61 | 90 | 16.5 | 0.26 | 46 | 0.60 |
| E | 61 | 90 | 16.5 | 0.26 | 51 | 0.66 |
| F | 86 | 100 | 14.6 | 0.30 | 43 | 0.34 |
| G | 87 | 100 | 14.5 | 0.30 | 43 | 0.33 |

Given that the density management prescription for Riparian Reserves would closely mirror the prescription for Connectivity/Diversity Blocks, future development would proceed along a similar growth trajectory. Conditions would be quite similar to those identified in Tables 21 (Unit K and a portion of M) and 22 (Units A and B).

## B. Wildlife

### *1. Threatened or Endangered Species*

Northern Spotted Owl

There are no units within ¼-mile of documented owl activity centers, so the potential for disturbance during nesting season would not be of concern, and no seasonal restrictions would be necessary.

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 in the overstory would begin to approach pre-thinning levels. Use by owls for dispersal and foraging would gradually increase, but full utilization would not likely occur until the lower canopy layers begin to close in again.

Over time, the units would develop greater structural and vegetative complexity and provide habitat capable of supporting more abundant prey and greater foraging opportunities. Units or portions of units allocated to the GFMA would not provide nesting and roosting habitat during this rotation, however, as they would be scheduled for regeneration harvest at CMAI. Units or portions of units allocated as Connectivity /Diversity Block stands would be expected to provide foraging and roosting habitat, and some potential nesting habitat until scheduled for regeneration harvest at 150-years-of-age. Portions of units located in Riparian Reserves would mature and develop late-successional characteristics that would provide nesting habitat as well as dispersal pathways.

Marbled Murrelet

In the Shep Boyardee project area, suitable nesting habitat is present in Units A and D, and contiguous to D on the northeast and southwest sides. Protocol surveys would be conducted for two years. 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 within proposed units, the potential for disturbance would still exist for unsurveyed suitable habitat within ¼-mile. To reduce the possibility, daily operational restrictions would be implemented consisting 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 Shep Boyardee project area would have no direct effect on murrelets because the units 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 that would provide nesting platforms. This would be particularly true for portions of the units allocated as Riparian Reserves, and not subject to regeneration harvest at CMAI as GFMA stands would be.

*2. Bureau Sensitive Species*

Peregrine Falcon

Potential affects to falcons in the vicinity of the Tater Tot project area would be associated with disturbance during nesting season. To alleviate this concern, operations on the project area would be prohibited during the period from January 15 and July 15. This restriction could be waived as early as May 15, for a given year, if surveys indicate nesting failure or early fledging of young.

## C. Fish and Essential Fish Habitat

### 1. Aquatic Habitat

The primary environmental factor that could be affected by density management in Riparian Reserves is stream temperature. As addressed in greater detail below under **Water Quality/Resources**, the "no-harvest" buffers that would be established on all intermittent and perennial streams would be sufficient to maintain streamside shading and prevent any direct solar heating that could lead to increases in water temperatures.

Habitat components that could be influenced are substrates as affected by fine sediment and large woody debris as it relates to the abundance and quality of pool habitat.

Suspended **sediment** in stream channels can directly impact juvenile salmonids by impairing foraging and feeding behavior and can reduce respiratory function and disease resistance (Waters 1995). Combinations of these stressors can lead to decreased survival of juveniles. Marginal increases in turbidity and suspended sediment can also result in harm to juvenile salmonids (Waters 1995).

Spawning habitat for salmonids can be adversely affected by fine sediment. It can fill interstitial spaces in gravel beds. This can prevent or reduce water flow to fish eggs, and physically cover eggs and embryos resulting in mortality (Waters 1995). Deposition of fine sediment in juvenile rearing habitat can result in a loss of habitat area and quality.

Thinning operations would not have any affect on sediment and substrate. The previously described "no-harvest" buffers would intercept and precipitate any sediment borne by overland run-off. Directional felling of trees away from the "no-harvest" buffers would prevent disturbance and erosion of stream banks and channels, eliminating their potential as sources of sediment. Contract provisions governing yarding operations would prohibit yarding in the "no-harvest" buffers and reduce the amount of ground disturbance outside the buffers with a corresponding reduction in the potential for sediment mobilization.

In some instances, run-off from logging roads can contribute more sediment than logging. (Waters 1995) Improperly designed ditches and cross drains can contribute to road-derived sedimentation by concentrating flow into narrow channels and increasing scouring power (Furniss et al. 1991).

Road use during the dry season would have a negligible affect on the current sediment regime. The affect of road construction, renovation and decommissioning on sediments is addressed in greater detail in the **Water Quality/Resources** section that follows.

In conclusion, fish spawning and rearing in streams adjacent to or downstream of thinning units are unlikely to be affected because sediment generated by thinning operations would not be expected to reach streams and sediment from timber hauling would be minimal and indistinguishable from existing baseline levels.

**Large woody debris** in stream channels has both abiotic and biotic beneficial effects. Large woody debris dissipates stream energy, which reduces the potential for stream bank and channel erosion, and reduces the likelihood of sediment. Large woody debris aggrades stream beds and allow the capture of substrates which may help to raise the floodplain and contribute to the development of off-channel habitat. It also creates pools that provide sheltering and rearing habitat for fish, and contributes organic matter and nutrients that provide a food source for aquatic invertebrates, thereby increasing overall stream productivity (Swanston 1991).

Density management would increase the growth rate of trees in Riparian Reserves in the areas most likely to contribute large wood to streams (FEMAT 1993 pp. V-26 & 27). It would also allow forest stands within the Riparian Reserves to develop at rates consistent with thinned upland stands. This would reduce by decades the time in which larger wood would become available for recruitment into streams. The greater abundance of large wood would, in turn, increase pool frequency and quality in perennial streams providing more abundant and productive habitat for resident and anadromous fish.

As previously discussed on p. 31, cumulative effects from management actions on private lands would continue to affect aquatic habitat and fish.

### 2. Threatened and Endangered Species

The only potential effect to the threatened Oregon Coast coho salmon would be associated with sediment. As previously described, sediment could affect egg incubation, embryo emergence and juvenile rearing. Juvenile and adult fish could also experience reduced respiratory efficiency resulting from gill irritation, and reduced feeding efficiency resulting from reduced visibility. The effects to the candidate Oregon Coast steelhead trout would be comparable to those for the coho salmon. For the reasons discussed above, the potential for sediments would be considered negligible and affects to fish unlikely.

### 3. Essential Fish Habitat

This alternative would have no adverse effect on Essential Fish Habitat downstream from proposed thinning units. No sediment would be anticipated from thinning and density management operations. Road construction, renovation and decommissioning, and the use of roads for timber hauling would generate negligible amounts of sediment which would not result in embedded spawning substrates or increased turbidity.

## D. Water Quality/Resources

*Peak Flows and Annual Yield*

*Stream Flow*

No measurable change in flows would be expected because the project involves only partial removal of vegetation in roughly five percent or less of any affected drainage. In an overview of several studies, Satterlund and Adams (1992, p. 253) found that "Lesser or nonsignificant responses occur [to water yield] . . . 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.

*Peak Flows*

Peak flow increases can occur in forested basins in the TSZ as the result of timber harvest. Timber harvest in the TSZ can provide openings where snow accumulates, and warm rain-on-snow events can melt this increased snowpack quickly and create higher than normal flows. These effects are primarily limited to areas within the TSZ with less than 30 percent crown closure (Watershed Professionals Network 1999, IV-11).

Although portions of each project area are located in the TSZ, the level of canopy closure following thinning and density management would be expected to average approximately 50 percent and would be sufficient to minimize any potential TSZ effects.

In the short term, no changes to peak flows would be anticipated in association with the existing transportation network. Roads would be constructed and/or renovated in such a manner that they would not concentrate run-off and deliver it directly into the stream network, potentially increasing peak flows at the project scale.

The intent would be to decommission temporary roads and renovated non-system roads in the same operating season in which they are constructed or renovated, such that there would be no increase in road density.

Approximately 13 miles of main haul roads do not currently meet drainage standards for new construction. Absent renovation and upgrades, they would continue to function as collectors and contribute to peak flows at the site scale.

As a consequence, the overall transportation network would continue to contribute to periodic spikes in peak flows. While these changes might be apparent at the site scale, they would constitute no more than a ten percent change at the drainage level which is not considered measurable.

*Water Quality*

*Stream Temperature*

Shade from trees near stream channels is important in reducing direct solar radiation. Density management in Riparian Reserves has the potential to increase stream temperature by creating canopy openings that reduce shade. Most of the streams within or adjacent to proposed units are intermittent in nature, however, and provide little or no surface flow to moderate water temperatures in perennial streams during the summer when elevated stream temperatures can occur. For these reasons, density management adjacent to intermittent streams would have a negligible effect on stream temperatures.

The "no-harvest" buffers, no less than 20-feet in width, would maintain canopy closure and shade directly above and adjacent to perennial stream channels. In conjunction with the anticipated 50 percent or greater canopy closure in the adjacent areas there would be adequate shade to prevent solar heating. As a consequence, density management adjacent to perennial streams would also have a negligible effect.

Thinning stands near streams would result in a more favorable height to diameter ratio for the remaining trees, which would decrease the risk of blow down (Smith 1962, p. 422) and encourage establishment of understory trees and shrubs whose multi-canopy layers would provide shade in the event that some or all of the overstory shade is lost due to a catastrophic event (Levno and Rothacher 1969 cited in Adams and Ringer 1994).

*Sediment*

Felling and yarding operations in Riparian Reserves could result in localized soil disturbance and the short-term potential for sediment.

The "no-harvest" buffers are intended to protect stream bank stability and eliminate potential bank and channel erosion. Research has shown that the contribution of root strength in maintaining stream bank integrity occurs within a distance of approximately one-half the crown diameter of existing vegetation (FEMAT 1993, p. V-26). The crown radius of second growth trees in the project stands ranges from about 15-30 feet. A "no-harvest" at least 20-foot in width would be sufficient to capture the root strength from the existing vegetation, and maintain bank stability and integrity.

In conjunction with the "no-harvest" buffers, seasonal operating restrictions and Best Management Practices would be implemented to minimize soil disturbance and potential erosion. Non-compacted 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). As a consequence, no sediment delivery from adjacent thinning and density management operations would be anticipated. In the long term, recruitment of additional large wood to stream channels, as a result of density management, would reduce suspended sediments by creating additional capacity for sediment storage.

The possibility exists that yarding corridors would be needed across intermittent stream channels to thin portions of three units. These corridors would be designed to minimize disturbance of the stream channel and prevent sediment delivery. They would be limited to 20-feet in width, spaced at least 200 feet apart, aligned as nearly perpendicular to the stream channels as practicable, and use limited to the dry season when stream channels are dry. One-end log suspension would be required, and lift trees utilized where practical to gain full suspension. Trees felled in the "no-harvest" buffer to clear corridors would be felled toward the stream channel and left on site to provide bank armoring. Final corridor locations and design would be approved by the contract administrator prior to cutting. As a consequence of these design features and the small areas involved, sediment would be negligible.

Forest roads can be 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.

Permanent road construction would be limited, with roads surfaced prior to harvest and hauling. Roads would be located in stable locations (i.e. ridge tops) and construction would incorporate Best Management Practices (ROD/RMP, pp. 131-136) specifically designed to minimize the potential for erosion and sediment transport. This would include minimizing excavation and endhauling any waste material to approved 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 and apply construction features similar to those for permanent road construction. As noted in Chapter 2 (p. 8), the intent would be to construct, use and decommission these roads in a single dry season. If not possible, these roads would be winterized and decommissioned after use the following year. In either event, because these roads would not be accessible to vehicular use during the wet season, and would not be considered a risk for sediment.

*Large Wood*

Streams in forested areas of the Pacific Northwest are historically dependent on large wood to reduce stream energy, capture sediment and smaller organic debris, create aquatic habitat, and provide other channel and ecosystem functions (MacDonald 1991, pp. 127-128). Large wood captures and stores sediment and maintains step-pool morphology in many small headwater streams. Research showed that as much as 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 (Megahan 1982; Keller et al. 1995, both cited in Curran 1999).

A recent study (Curran 1999) found that spill resistance from step-pool reaches contributed 90 percent of the friction loss that reduced water velocity in some Western

Washington headwater streams. This has the potential to delay flow from these tributaries during storm events and reduce peak flows downstream.

All existing Decay Class 3, 4 and 5 large down wood would be reserved under timber sale contract provisions, so that density management would have no direct or immediate affect on the availability of large down wood within Riparian Reserves.

As discussed above (p. 39), density management in Riparian Reserves would increase tree growth rates in the area most likely to contribute large wood to stream channels, and allow forest stands in the Riparian Reserves to develop at a rate consistent with the thinned upland stands. This would ensure a greater rate of growth and larger tree size in a shorter time period, so that the long-term availability of large wood would be accelerated by decades. It would also ensure that large wood would be available in those areas where there would be the greatest opportunity for interaction with streams.

## E. 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. Main skid trails, landings and pile area would cumulatively affect less than ten percent of the thinning area.

- 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. 6-7) to the part of the year when soil moisture content is at its lowest, and soils are most resistant to compaction.

- Main skid trails, including those from previous entries, would be selectively tilled, mulched and seeded, or treated in other manners to retard erosion. Main skid trails 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 have 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. Alternative Three – Proposed Action / Expanded Winter Operations

As with Alternative Two, this alternative would meet the purpose and need for action, identified in Chapter 1 of this environmental assessment. What differentiates the two action alternatives is the proposed expenditure of additional monies for renovation of surfaced roads, renovation and retention of some unsurfaced roads, and redesignation of some temporary roads as permanent.

### A. Timber/Vegetation

The commercial thinning and density management prescriptions would remain the same, with only variations in the operational season for selected units. As a consequence, the short and long-term outcome and effect would be consistent with those described for Alternative Two (pp. 32-36).

### B. Wildlife

*1. Threatened or Endangered Species*

Northern Spotted Owl

There would be no potential for disturbance to owls during nesting season because, as noted on pp. 16 and 36, there are no owl activity centers within ¼-mile of any proposed thinning units. The affect of thinning and density management on current habitat conditions and owl utilizations of that habitat would be consistent with that described for Alternative Two, because the same silvicultural prescriptions would apply regardless of the season of operation. As a consequence, the affect of Alternative Three on owls would be unchanged from that described for Alternative Two on pp. 36-37.

Marbled Murrelet

In the Shep Boyardee project area, the affect of thinning and density management on suitable murrelet nesting habitat would be consistent with that described for Alternative Two, because the same silvicultural prescriptions would apply regardless of the season of operation.

Winter operations on Unit E and a portion of Unit A would reduce the potential for disturbance by allowing a portion of the thinning project to be accomplished outside of nesting season, and eliminate the need for daily operational restrictions for these areas. The remainder of the project area would still be subject to daily operational restrictions, however, as operations in late summer would still pose the risk for disturbance.

*2. Bureau Sensitive Species*

The affect of Alternative Three on peregrine falcons would be the same as described for Alternative Two. Seasonal restrictions for disturbance would still apply to address concerns for disturbance during the nesting season.

## C. Fish and Essential Fish Habitat

### 1. Aquatic Habitat

The marking prescriptions for thinning in the General Forest Management Area and density management in the Connectivity/Diversity Block and Riparian Reserve land use allocations would remain the same. As a consequence, the effects of this alternative on streamside shade, water temperature, large woody debris, and pool and quality would be consistent with those for Alternative Two.

The additional road renovation proposed in association with expanded winter harvest and hauling opportunities would continue to represent a short-term potential for sediment and its associated effects on habitat conditions. As with Alternative Two, this potential would be localized and negligible. In the long term, the additional road renovation would reduce sediment with localized improvements in the condition of spawning substrates and pool habitat. These improvements would not be noticeable at a broader scale, though. Sediment from the Tater Hill slide would continue to affect spawning and rearing habitat in downstream reaches of South Myrtle Creek, as would agricultural run-off in lower reaches of Olalla Creek and Days Creek, resulting in degradation of habitat conditions in these areas.

### 2. Threatened and Endangered Species

In the short term, the effects to fish would be commensurate to those described for Alternative Two. In the long term, reductions in sediment at the project scale would result in improved conditions for spawning and rearing that could include improved egg incubation and embryo emergence, as well as higher juvenile survival as a consequence of reductions in turbidity and embeddedness of substrates.

### 3. Essential Fish Habitat

As with Alternative Two, no adverse effects to Essential Fish Habitat would be anticipated in areas downstream of the project areas. In the longer term, reductions in fine sediment would be expected to result in improved conditions at local levels.

## D. Water Quality/Resources

This alternative would be identical to Alternative Two in its affect on base and peak flows, stream temperature, large woody debris and channel condition.

Water quality improvements, in terms of reductions in fine sediment, would accrue in the longer term in association with renovation of approximately 13 miles of main haul route. Portions of many of these roads currently have segments where ditch lines and cross drains divert water directly into headwalls or stream channels. Renovation would reduce the potential to alter stream flow or deliver sediment to adjacent streams during winter haul activities.

Renovation of these roads would also provide a long-term (years) benefit to flow routing and water quality in the affected drainages. These beneficial effects would be apparent at the site level, but would likely not be measurable at the drainage scale.

Renovation of the roads to drainage standards required for new construction would divert flow from intercepted groundwater and road surfaces away from stream channels and toward the forest floor where it would infiltrate. Renovation would include installing additional cross drain culverts or drain dips immediately above stream crossings to prevent road-derived water and sediment from entering streams (ROD/RMP, p. 134). Renovation could also include resurfacing with aggregate, stabilizing cutbanks and fill slopes, and restoring outslope or crown sections to reduce erosion, further reducing the potential for sediment.

### E. Soils

The potential affects to soils would remain unchanged from those described under Alternative Two. Special contract provisions and Best Management Practices for ground-based and cable harvest, described above on p. 43, would still apply and the effects would be comparable with those anticipated under Alternative Two.

## IV. Other Federal Timber Management and Restoration Activities Planned in the Project Watersheds

In the Olalla-Lookingglass watershed, three regeneration harvests are planned for sale over the next three to five years, involving approximately 540 acres of lands allocated as General Forest Management Area and Connectivity/Diversity Block. In conjunction with the sales there will be improvements made to existing roads designed to reduce sediment and improve water quality and aquatic habitat.

In the Myrtle Creek watershed, there are no other commercial thinnings or regeneration harvests currently under analysis. Watershed restoration projects underway are expected to replace at least a dozen large stream-crossing culverts that will restore access to in excess of 21 miles of anadromous stream habitat. Other projects will include road improvements, slide stabilization, a mile of instream structure placement and some selected road decommissioning.

In the South Umpqua River watershed, a Late-Successional Reserve habitat restoration and density management project is currently under study and development. One regeneration harvest of approximately 150 acres is planned in the watershed in the next five years.

Other forest removal could occur in association with road construction and improvements conducted under reciprocal rights-of-way agreements. The exact amount of forest removal is difficult to quantify but are not anticipated to exceed tens of acres per decade. Road construction conducted under terms of reciprocal rights-of-way agreements would employ measures designed to minimize potential for additional degradation of water quality and aquatic habitat.

Various aquatic restoration projects are also under development, primarily targeted at replacing and upgrading stream crossings. These projects would require temporary by-pass roads, and as with reciprocal road actions, the amount of forest removal would not be anticipated to exceed tens of acres per decade.

## V. 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 (Winter 2002). If a decision is made to implement one of the action alternatives, notice(s) would be published in *The News-Review*, Roseburg, Oregon.

## I. Agencies & Persons Contacted:

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

## II. Preparers and Contributors:

| | |
|---|---|
| Paul Ausbeck | EA Writer/NEPA Coordinator |
| Gary Basham | Botanist |
| Kevin Carson | Silviculture/Management Representative |
| Dave Fehringer | Project Leader/Forester |
| Dennis Hutchison | Soil Scientist |
| Helmut Kreidler | Engineering |
| Dave Mathweg | Recreation/Visual Resources Management |
| Frank Oliver | Wildlife Biologist |
| Don Scheleen | Achaeologist/Cultural Resources |
| Cory Sipher | Fisheries Biologist |
| Larry Standley | Hydrologist |

## III. Agencies, Organizations, and Individuals to be notified of the Availability of the EA and "Draft" 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, Legal Counsel for the Douglas County Commissioners
U.S. Fish and Wildlife Service

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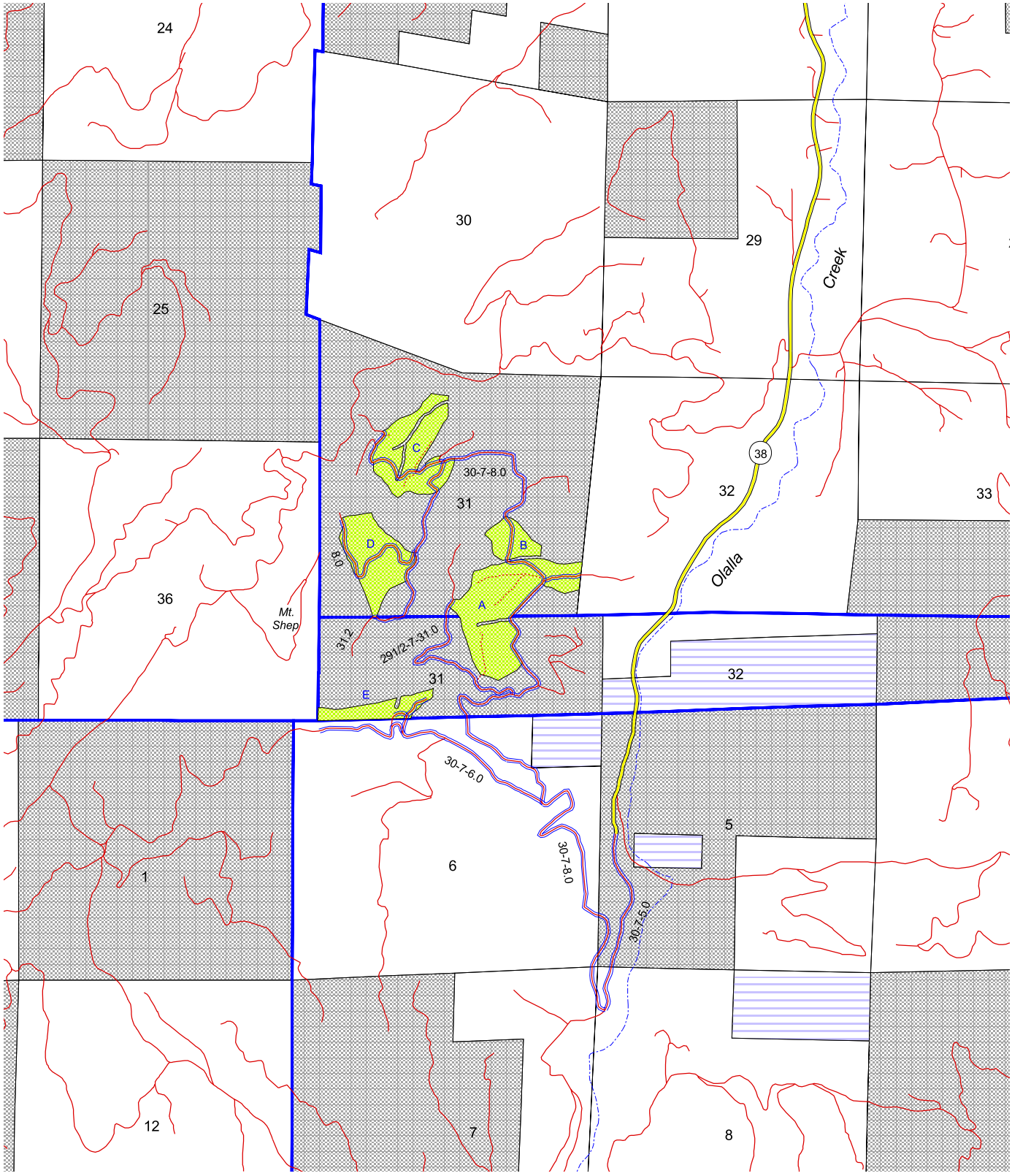
# Appendix A

# Maps of Proposed Alternative 2

'South River Commercial Thinning' EA

# SHEP BOYARDEE

## Proposed Commercial Thinning




N

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T29, 291/2S, R7W

Willamette Meridian, Douglas Co., OR.

0 0.5 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.

County Road
Existing Road
Haul Route
Spur to be Constructed

Thinning Area
BLM (O&C) Land
BLM (PD) Land
Private Land

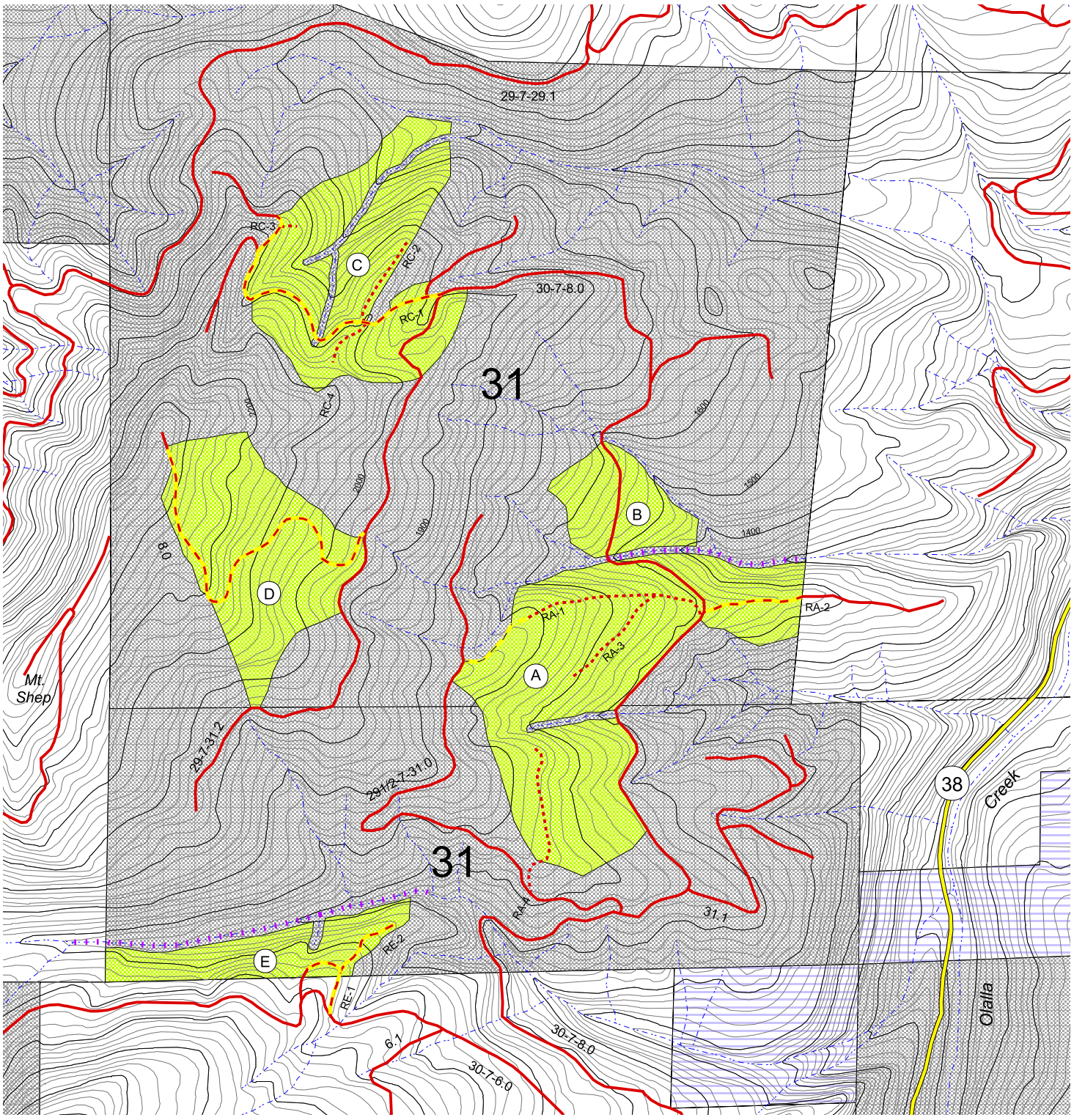
7-23-2003

'South River Commercial Thinning' EA

# SHEP BOYARDEE

## Proposed Commercial Thinning

Alternative 2

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T29, 291/2S, R7W

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
County Highway
Renovate, Decommission
Construct, Decommission
Stream
Stream, Fish Presence Not Varified
100' Contour
20' Contour

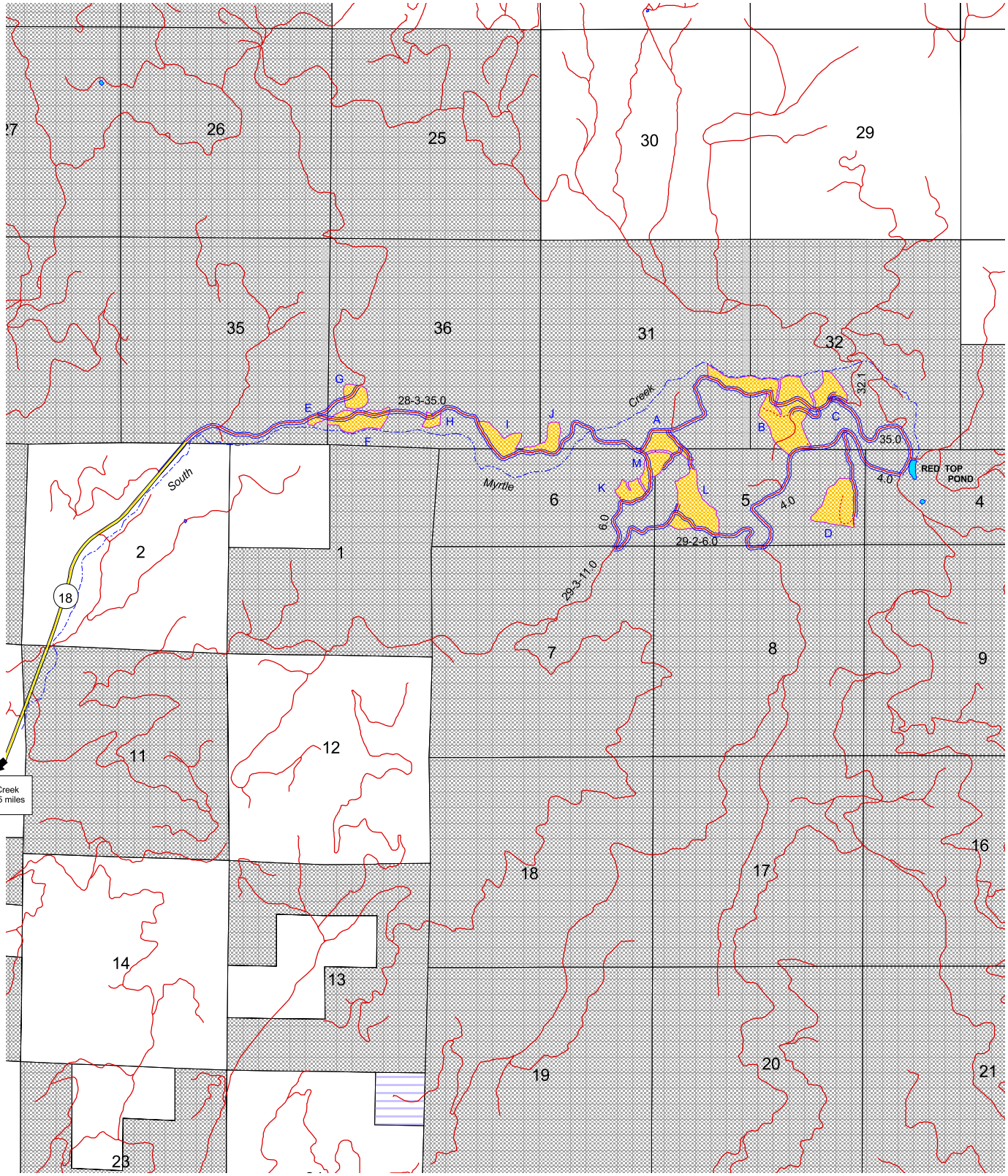
Thinning Area
BLM (O&C) Land
BLM (PD) Land
Private Land

7-23-2003

'South River Commercial Thinning 2003' EA

# TATER TOT

## Proposed Commercial Thinning

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0 1 Miles

T28,29S R2,3W

Willamette Meridian, Douglas Co., OR.

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.

Paved Highway
Existing Road
Haul Route
Road to be Constructed

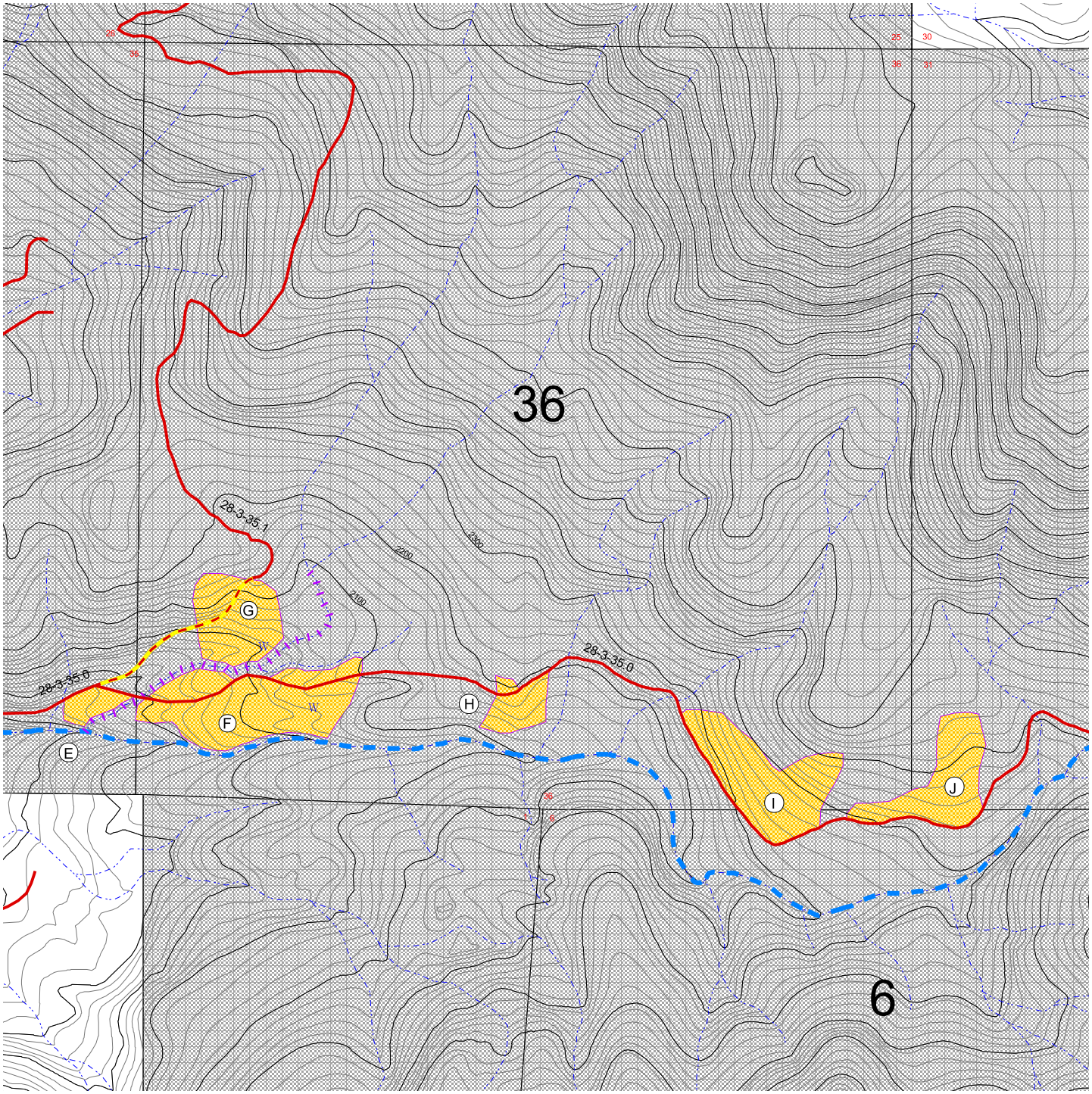
Thinning Area
O&C Land
PD Land
Private Land

7-23-2003

# TATER TOT

Alternative 2

## Proposed Commercial Thinning




N
W E
S

T28,29S R2,3W

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.

W Wet Area
Existing Road
Renovate, Decommission
100' Contour
20' Contour
Stream
Fish Bearing Stream
Stream, Fish Presence Not Varified

Thinning Area
O&C Land
Private Land

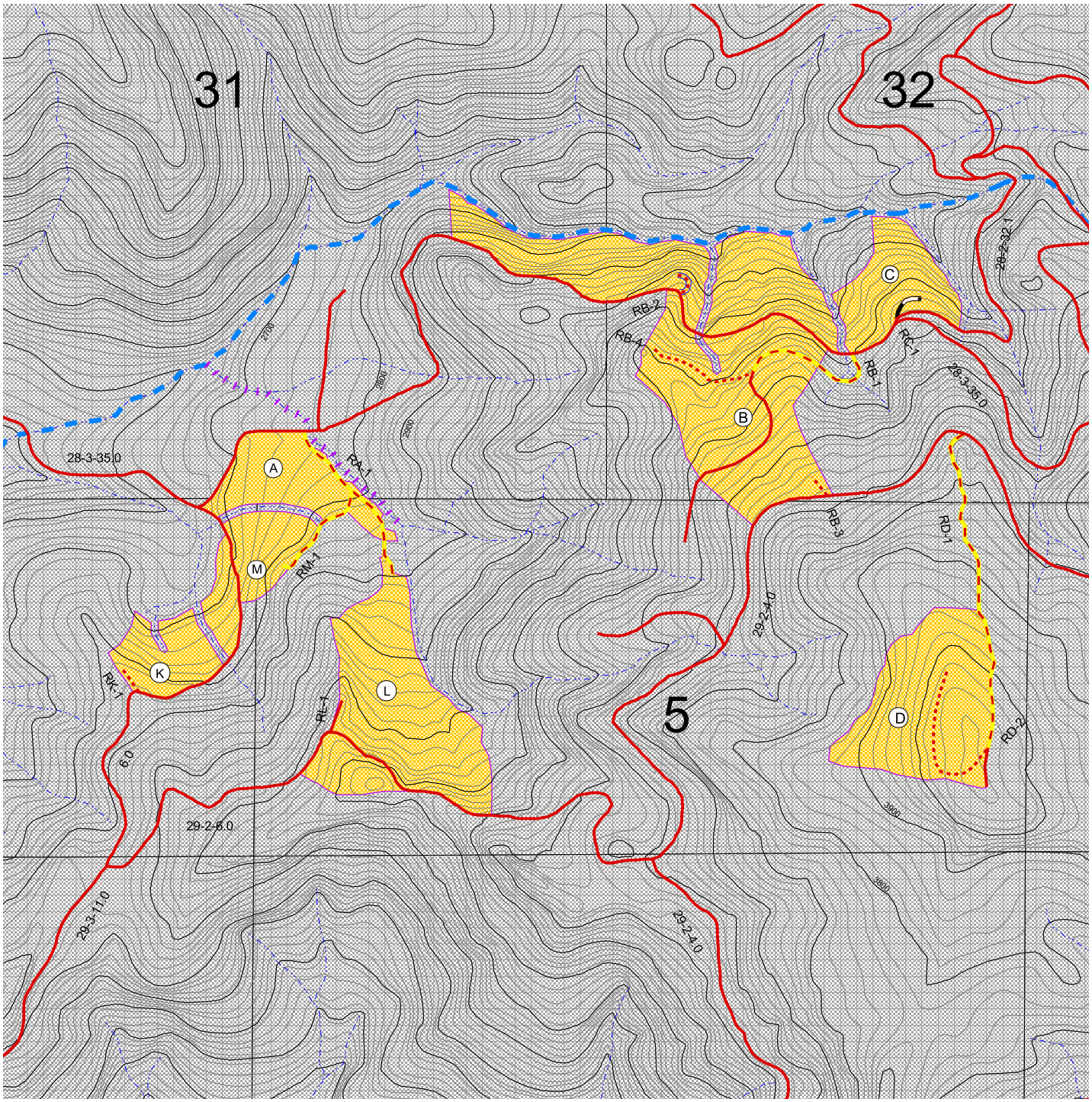
7-23-2003

'South River Commercial Thinning 2003' EA

# TATER TOT

Alternative 2

## Proposed Commercial Thinning




N
W E
S

T28,29S R2W

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.

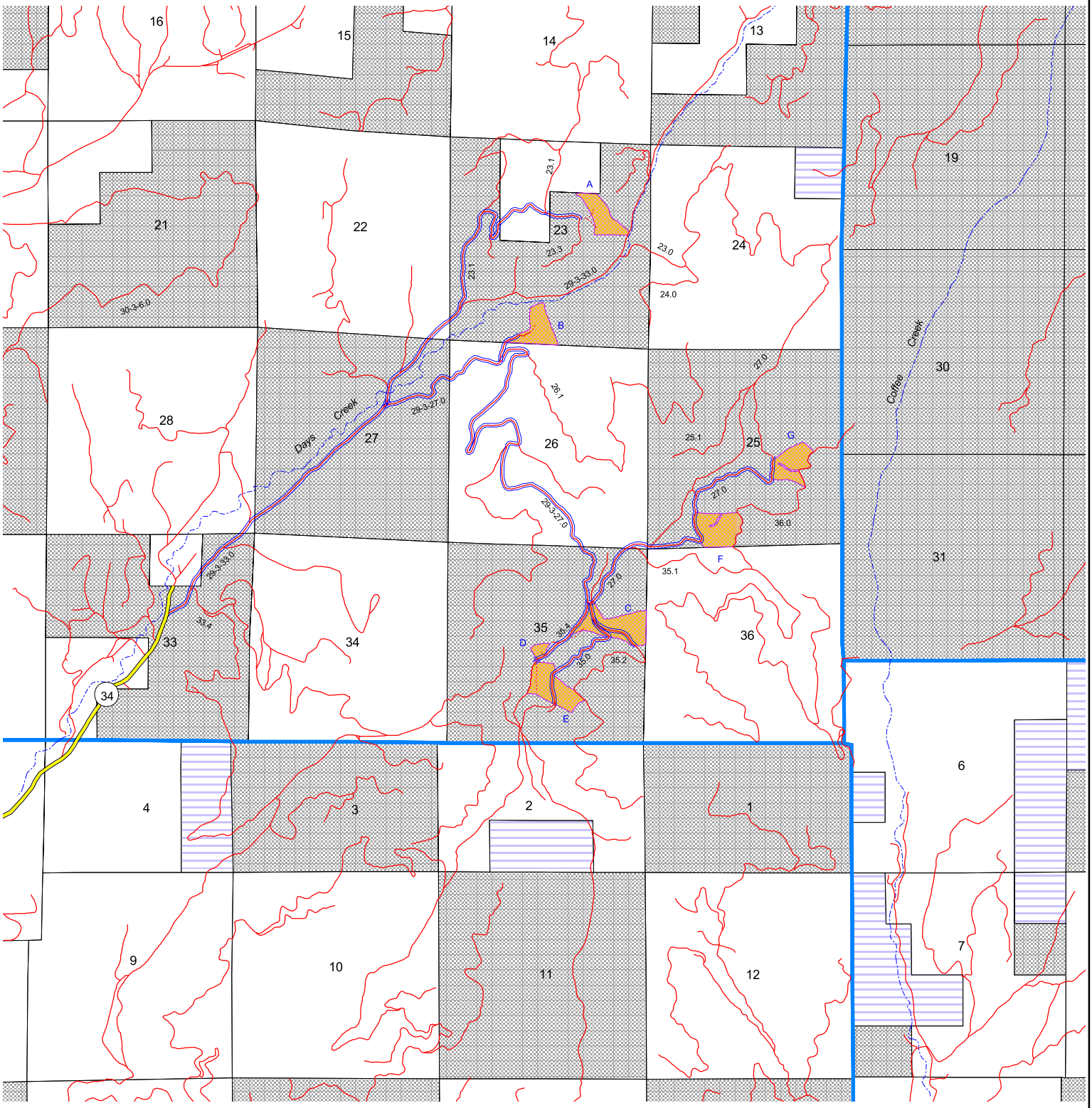
- Existing Road
- Construct, Decommision
- Construct, Permanent Rock
- Renovate, Permanent Rock
- Renovate, Decommission
- 100' Contour
- 20' Contour
- Stream
- Fish Bearing Stream
- Stream, Fish Presence Not Varified
- Thinning Area
- BLM (O&C) Land

7-23-2003

'South River Commercial Thinning' EA

# WASTED DAYS

## Proposed Commercial Thinning




N
W E
S

T29S R3W

Willamette Meridian, Douglas Co., OR.

0 1 Miles

Paved Highway
Existing Road
Access\Haul Route
Spur to be Constructed

Thinning Area
BLM (O&C) Land
BLM (PD) Land
Private Land

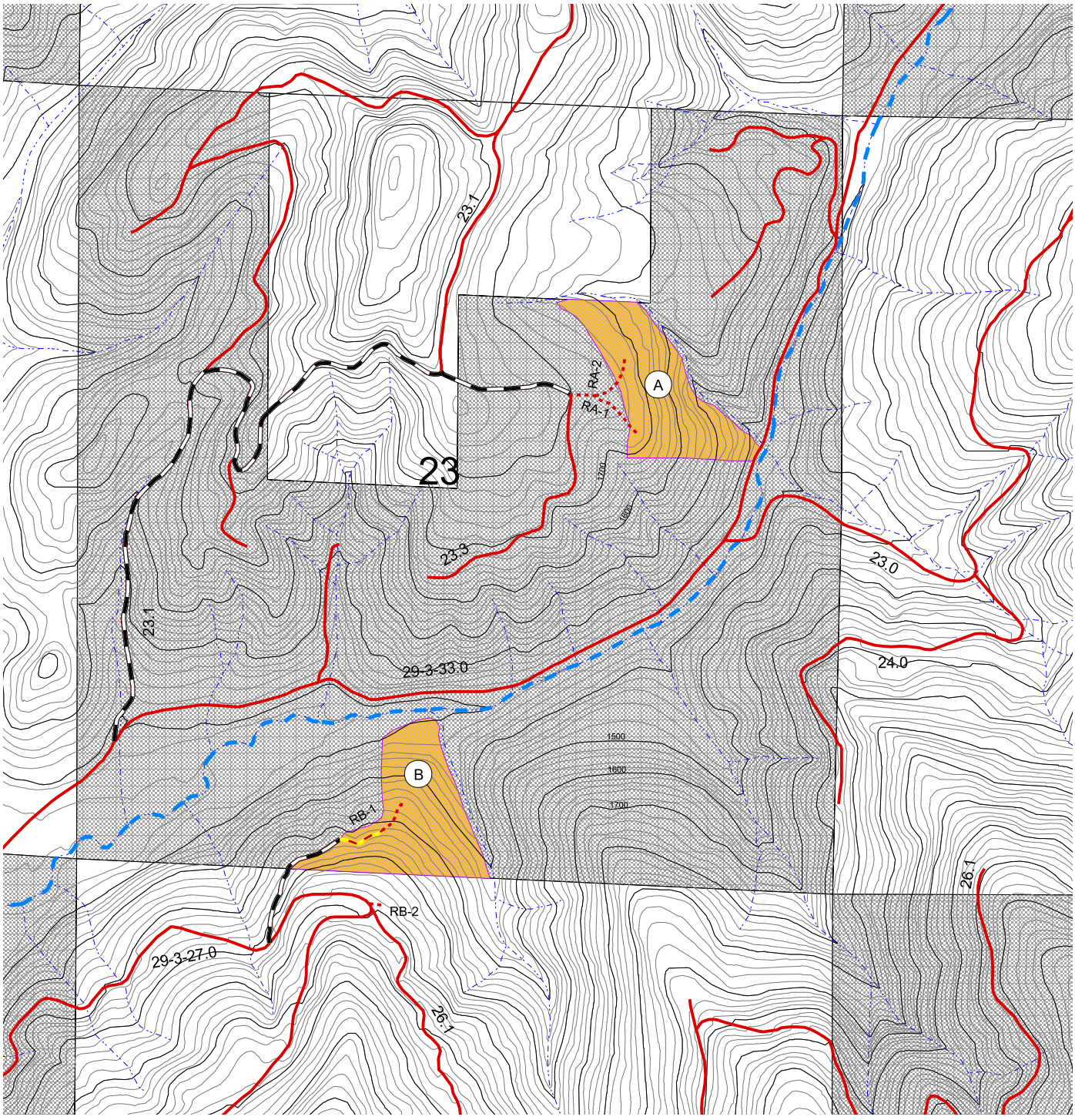


7-23-2003

Alternative 2

# WASTED DAYS

*Proposed Commercial Thinning*




N
W E
S

T29S R3W

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
- Road To Be Renovated
- Construct, Decommission
- Renovate, Decommission
- Stream
- Fish Bearing Stream
- 100' Contour
- 20' Contour

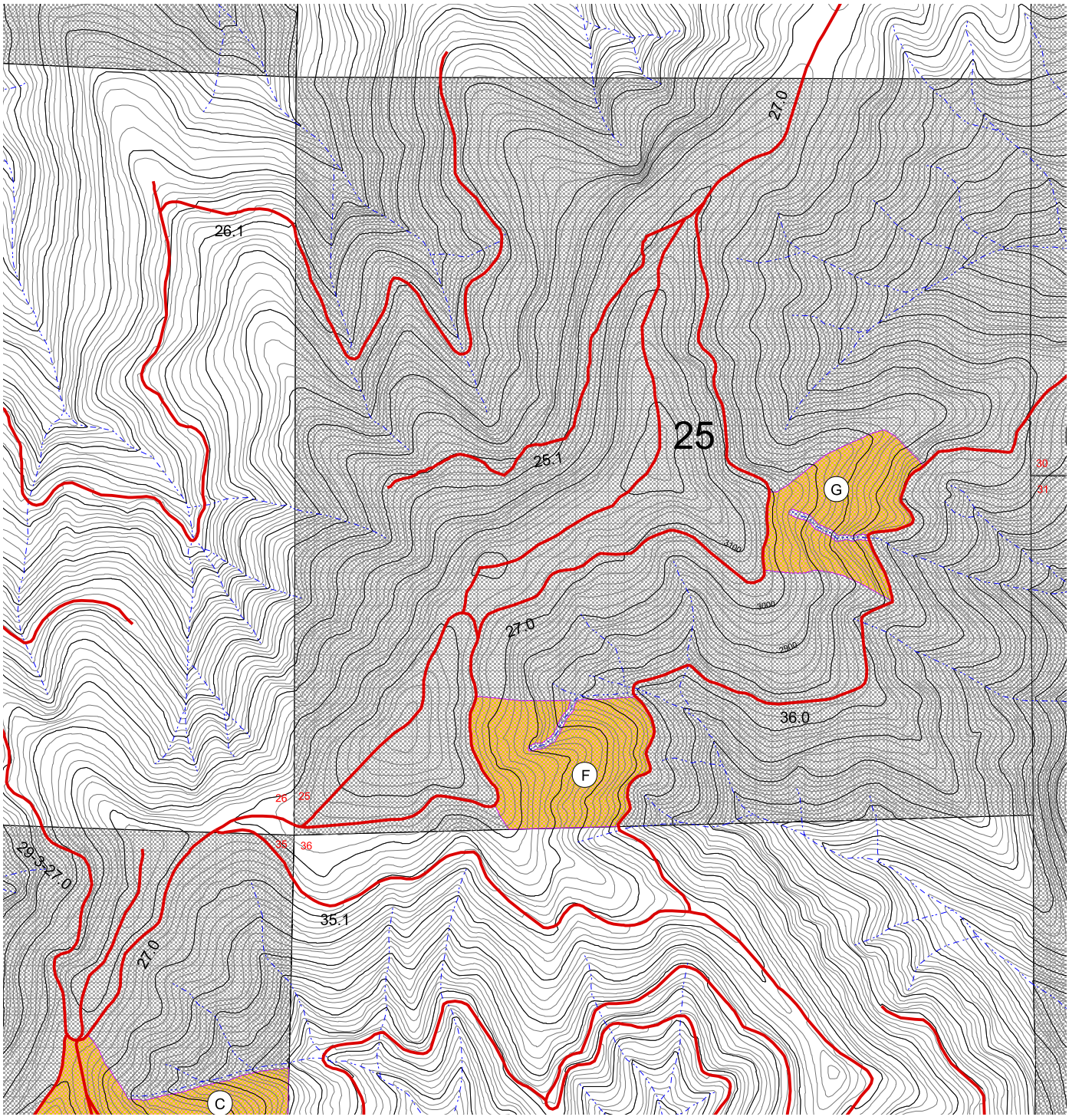
- Thinning Area
- BLM (O&C) Land
- Private Land

7-23-2003

# WASTED DAYS

*Proposed Commercial Thinning*

Alternative 2




N
W E
S

T29S R3W
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
Stream
100' Contour
20' Contour

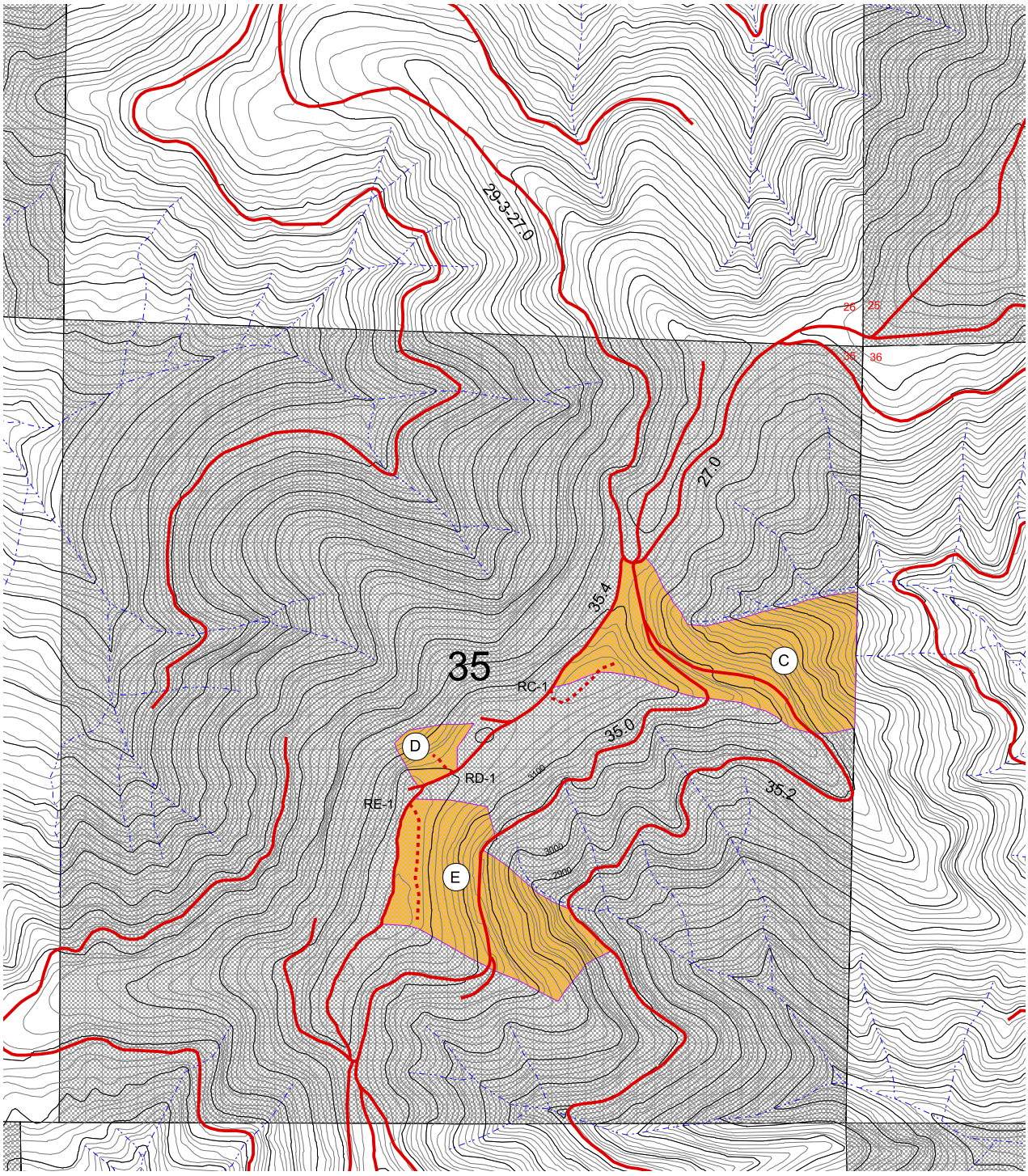
Thinning Area
BLM (O&C) Land
Private Land

7-23-2003

Alternative 2

# WASTED DAYS

*Proposed Commercial Thinning*




N
W E
S

T29S R3W

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
Construct, Decommission
Stream
100' Contour
20' Contour

Thinning Area
BLM (O&C) Land
Private Land

7-23-2003

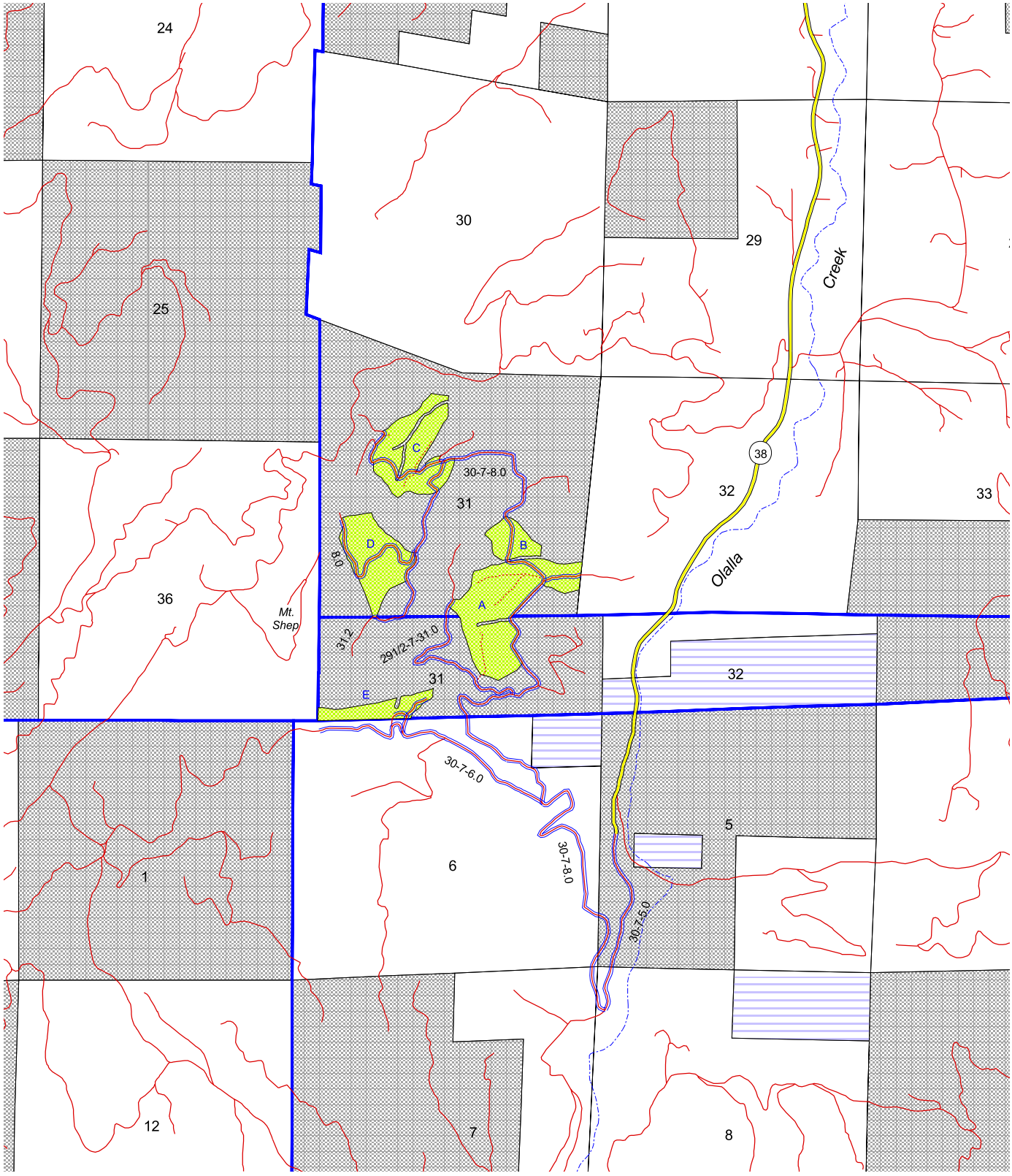
# Appendix B

# Maps of Proposed Alternative 3

'South River Commercial Thinning' EA

# SHEP BOYARDEE

## Proposed Commercial Thinning




N

W E

S

T29, 291/2S, R7W

Willamette Meridian, Douglas Co., OR.

0 0.5 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.

County Road
Existing Road
Haul Route
Spur to be Constructed

Thinning Area
BLM (O&C) Land
BLM (PD) Land
Private Land

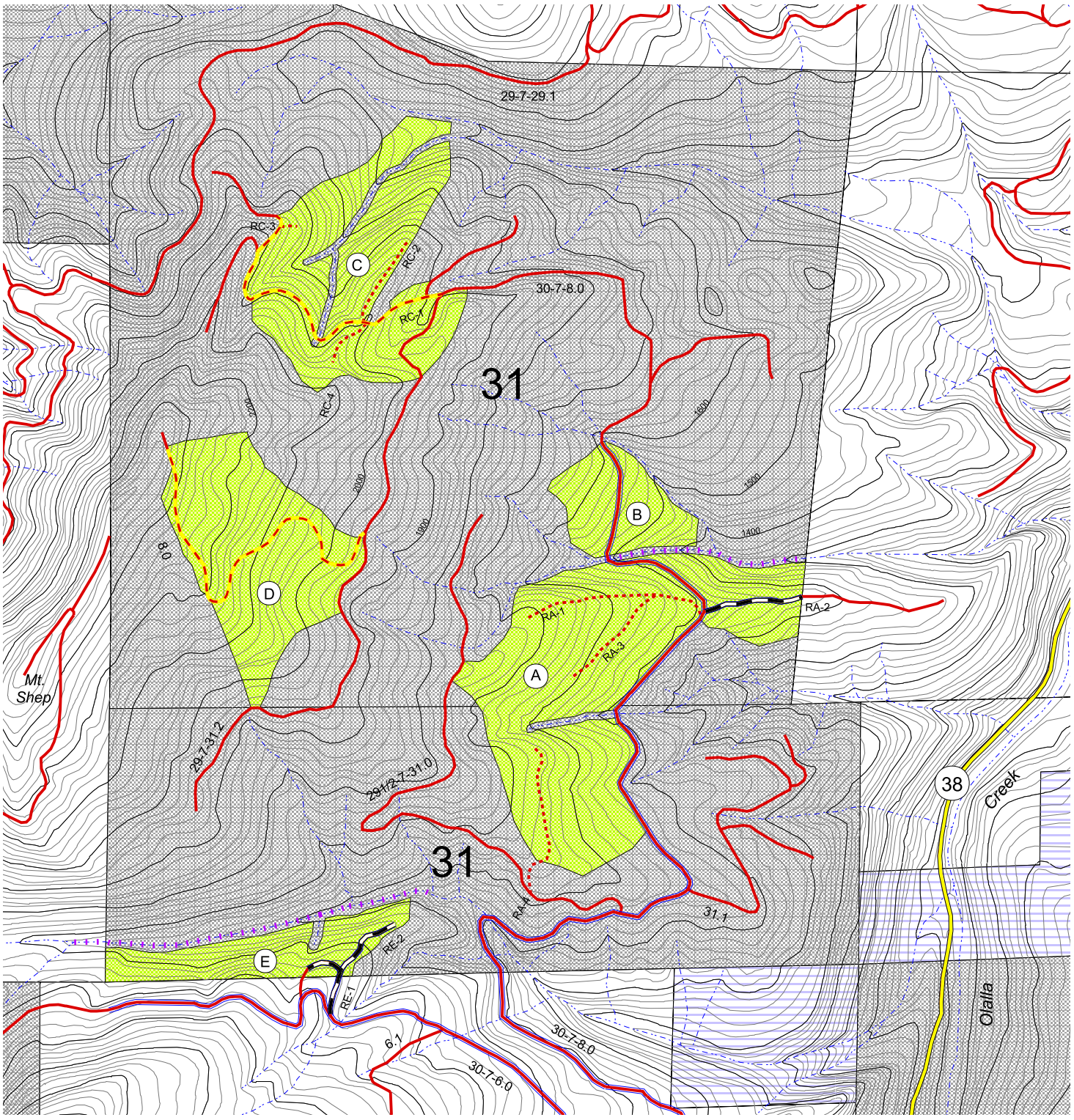
7-23-2003

'South River Commercial Thinning' EA

# SHEP BOYARDEE

## Proposed Commercial Thinning

Alternative 3




N
W E
S

T29, 291/2S, R7W

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.

- Renovate, Winter Haul
- Renovate, Rock
- Existing Road
- County Highway
- Renovate, Decommission
- Construct, Decommission
- Stream
- Stream, Fish Presence Not Varified
- 100' Contour
- 20' Contour

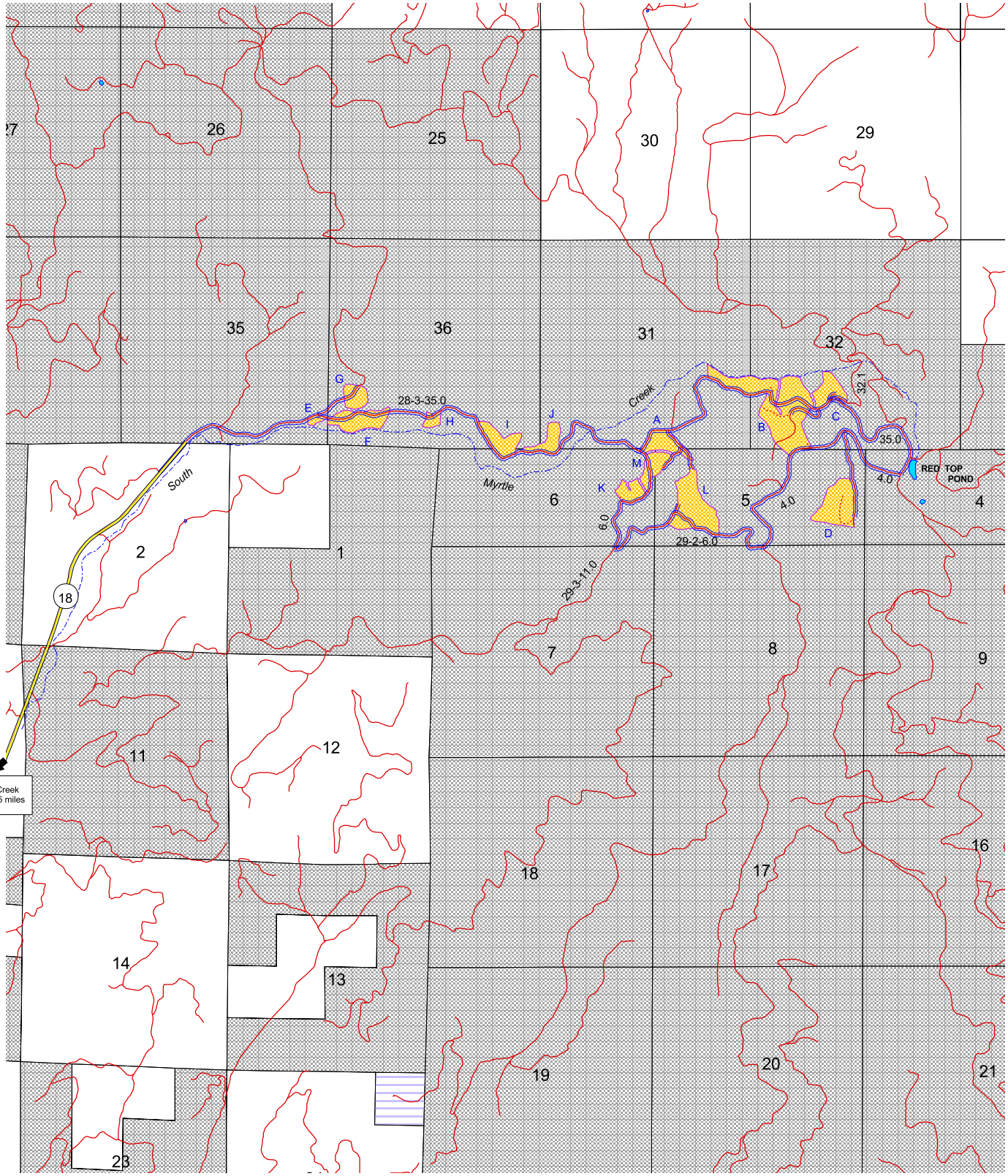
- Thinning Area
- BLM (O&C) Land
- BLM (PD) Land
- Private Land

7-23-2003

'South River Commercial Thinning 2003' EA

# TATER TOT

## Proposed Commercial Thinning




N
W E
S

0 1 Miles

T28,29S R2,3W

Willamette Meridian, Douglas Co., OR.

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.

Paved Highway
Existing Road
Haul Route
Road to be Constructed

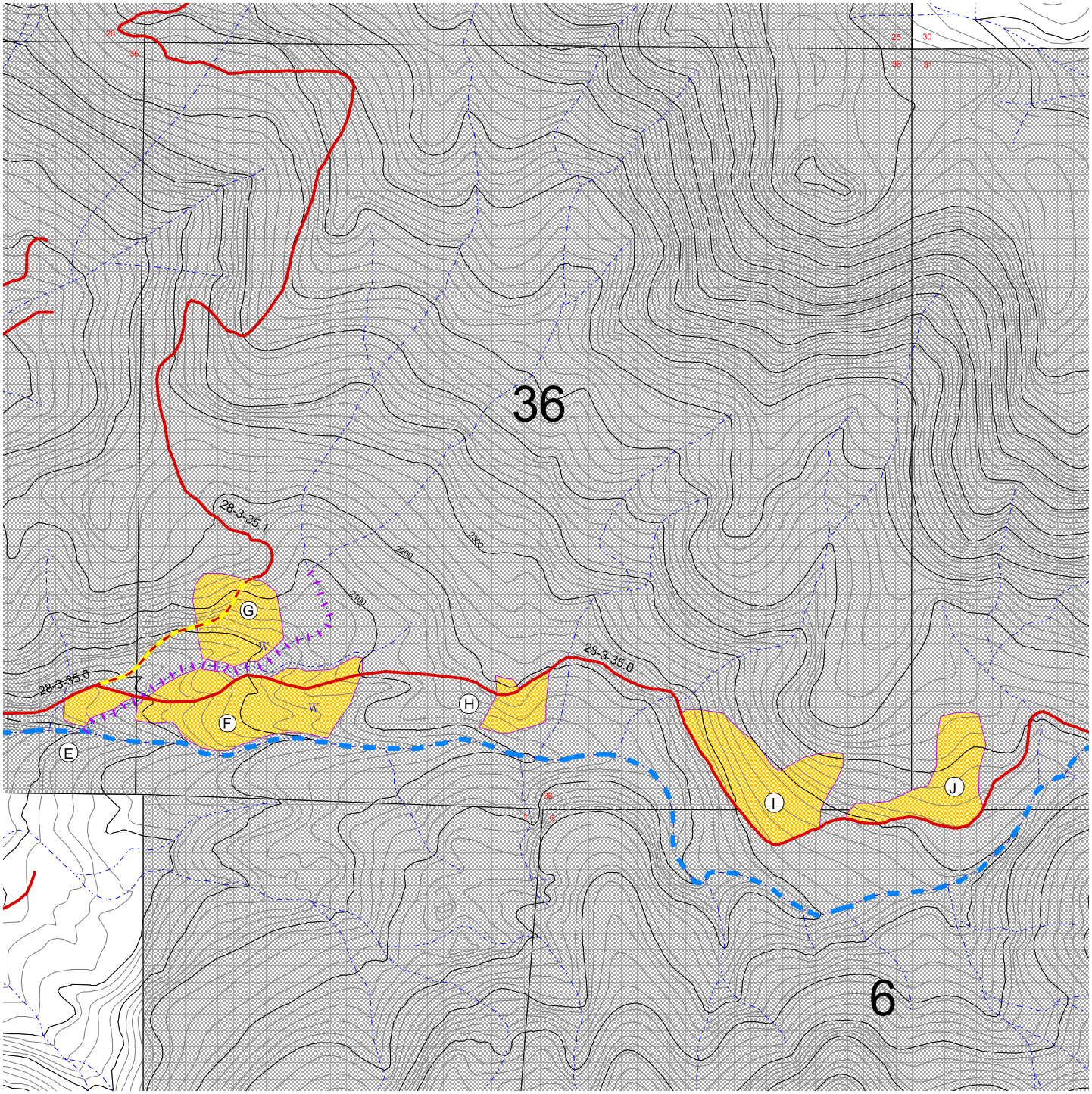
Thinning Area
O&C Land
PD Land
Private Land

7-23-2003

# TATER TOT

Alternative 3

## Proposed Commercial Thinning




N
W E
S

T28,29S R2,3W

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.

W Wet Area
Existing Road
Renovate, Decommission
100' Contour
20' Contour
Stream
Fish Bearing Stream
Stream, Fish Presence Not Varified

Thinning Area
O&C Land
Private Land

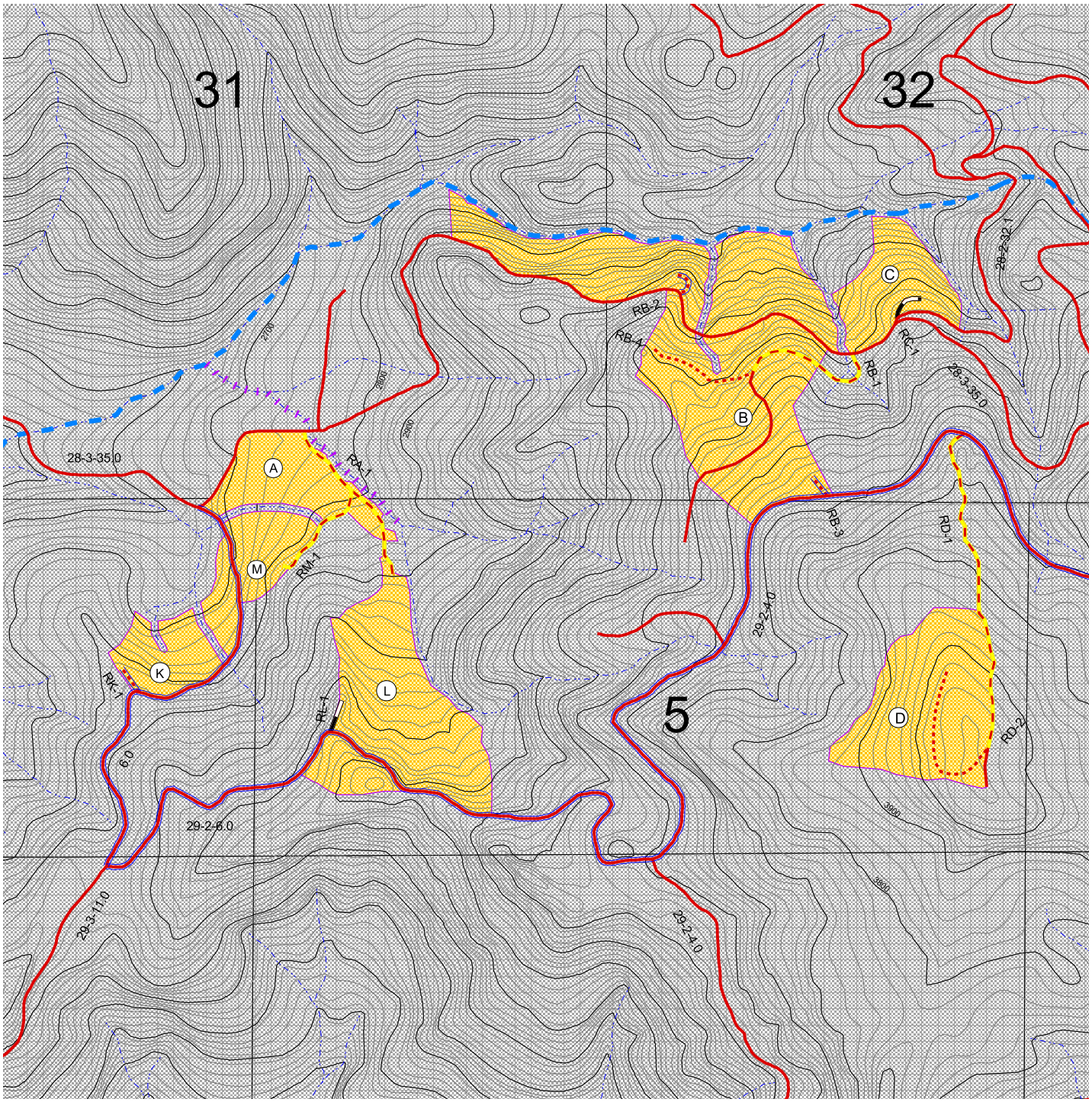
7-23-2003

'South River Commercial Thinning 2003' EA

# TATER TOT

Proposed Commercial Thinning

Alternative 3




N
W E
S

T28,29S R2W

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.

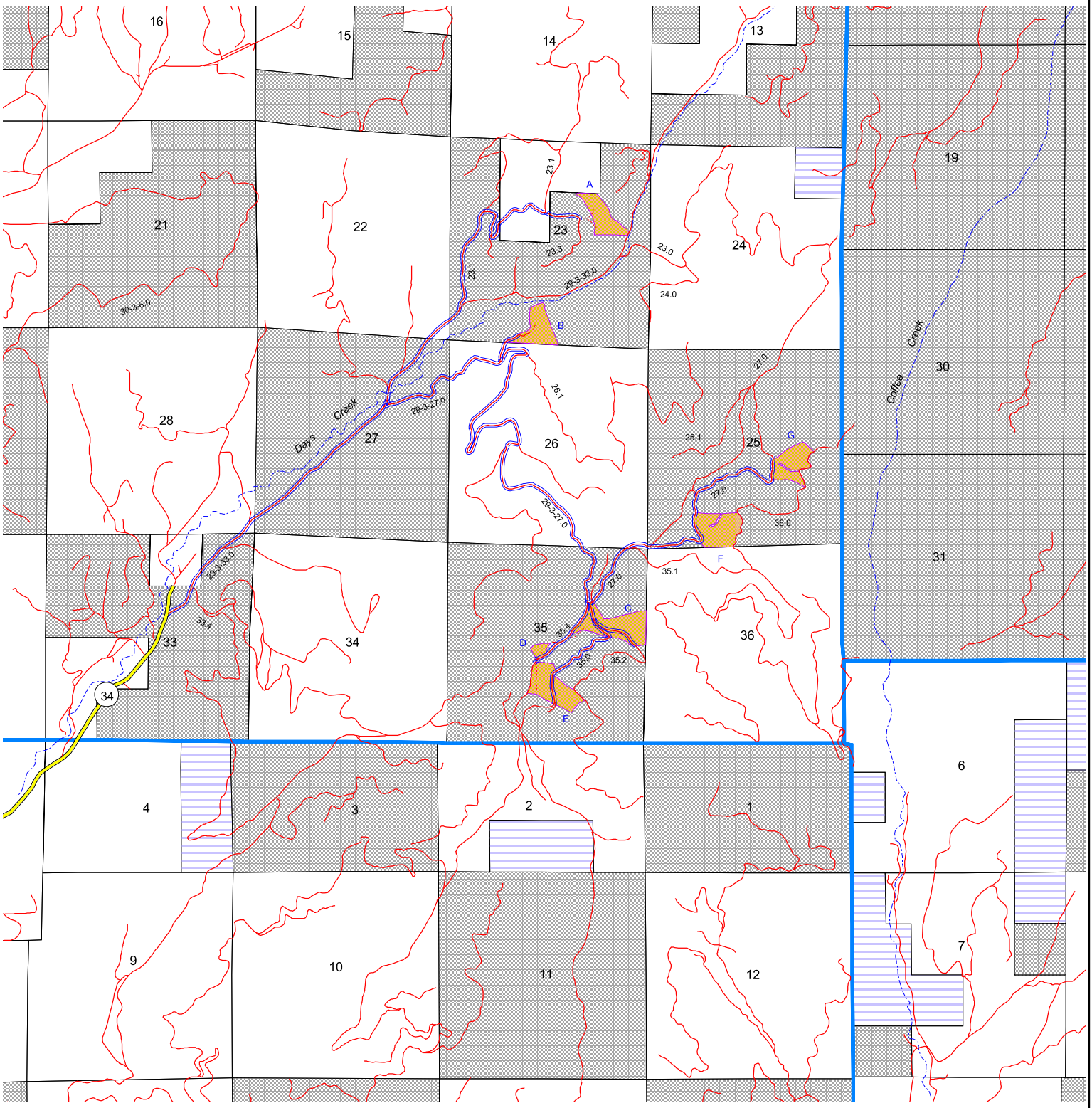
- Renovate, Winter Haul
- Existing Road
- Construct, Decommision
- Construct, Permanent Rock
- Renovate, Permanent Rock
- Renovate, Decommission
- 100' Contour
- 20' Contour
- Stream
- Fish Bearing Stream
- Stream, Fish Presence Not Varified
- Thinning Area
- BLM (O&C) Land

7-23-2003

'South River Commercial Thinning' EA

# WASTED DAYS

## Proposed Commercial Thinning




N
W E
S

T29S R3W

Willamette Meridian, Douglas Co., OR.

0 1 Miles

Paved Highway
Existing Road
Access\Haul Route
Spur to be Constructed

Thinning Area
BLM (O&C) Land
BLM (PD) Land
Private Land

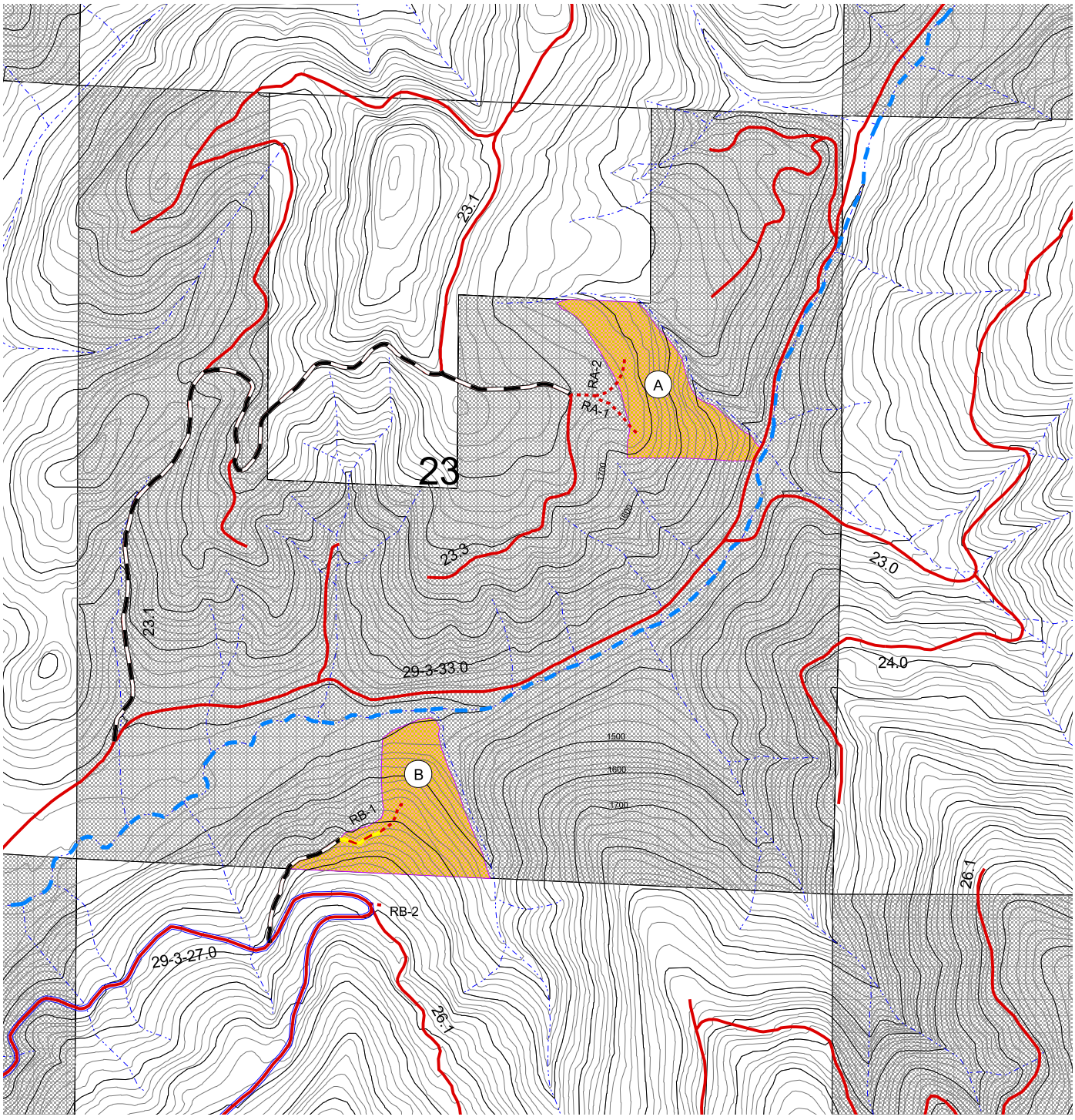


7-23-2003

# WASTED DAYS

*Proposed Commercial Thinning*

Alternative 3




N
W E
S

T29S R3W

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
- Road To Be Renovated
- Construct, Decommission
- Renovate, Decommission
- Renovate, Winter Haul
- Stream
- Fish Bearing Stream
- 100' Contour
- 20' Contour

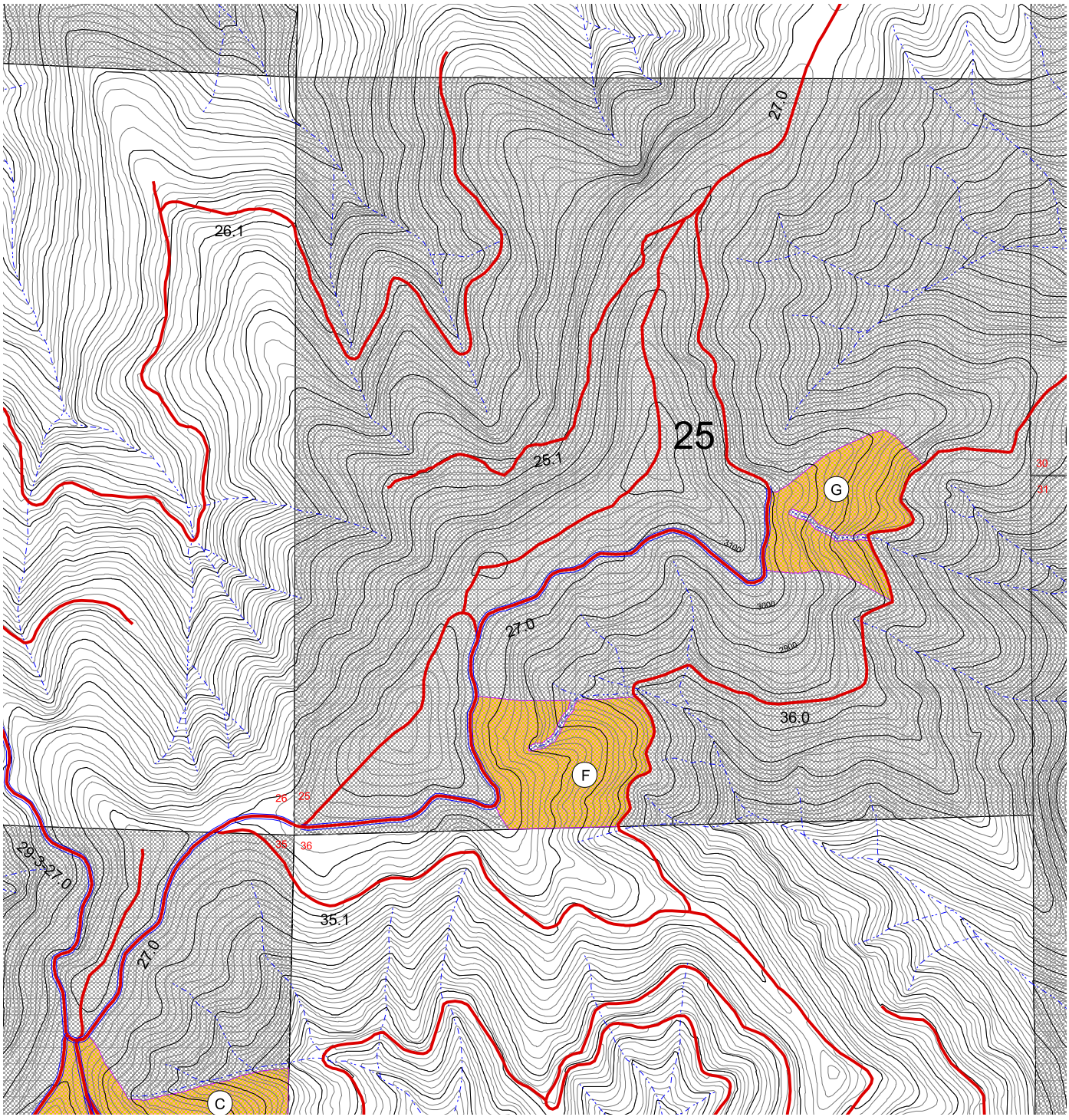
- Thinning Area
- BLM (O&C) Land
- Private Land

7-23-2003

# WASTED DAYS

*Proposed Commercial Thinning*

Alternative 3




N
W E
S

T29S R3W

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
Renovate, Winter Haul
Stream
100' Contour
20' Contour

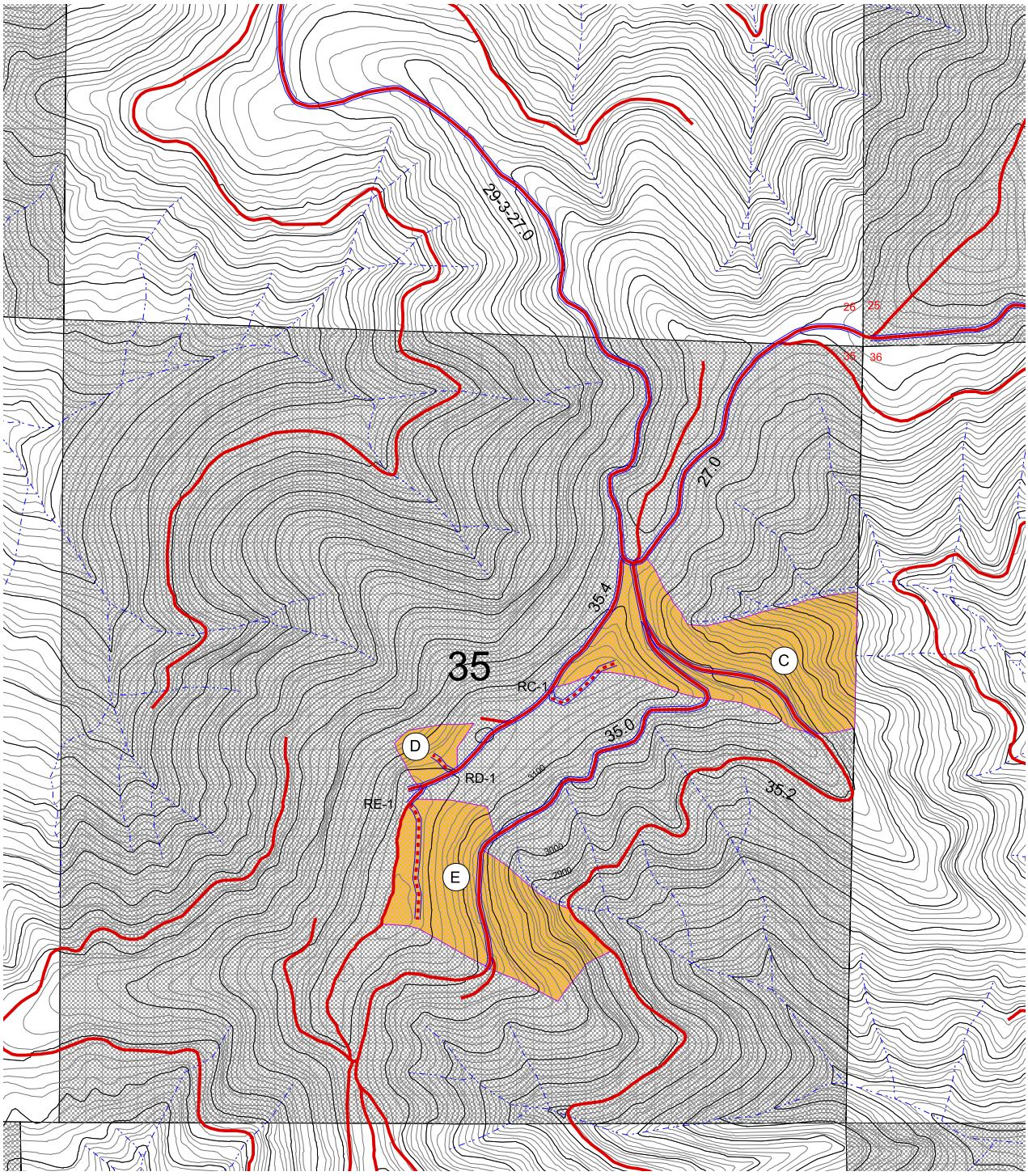
Thinning Area
BLM (O&C) Land
Private Land

7-23-2003

Alternative 3

# WASTED DAYS

*Proposed Commercial Thinning*




N
W E
S

T29S R3W

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
Renovate, Winter Haul
Construct, Permanent Rock
Stream
100' Contour
20' Contour

Thinning Area
BLM (O&C) Land
Private Land

7-23-2003

# Appendix C

# Comparison of Road Construction And Renovation Costs Between Alternatives Two and Three*

* Costs reflect the difference between Alternative Two and Alternative Three, but do not constitute a decision to reject or fully implement all road improvements described. Implementation of only a portion of the road improvements described is still within the context of consequences analyzed in the two alternatives.

| Project Area/Unit: **Shep Boyardee CT** | Road Construction and Renovation Cost[1] | | |
|---|---|---|---|
| | Summer haul | Winter haul[2] | Comments |
| A | $9,100 | $23,200 | 11 of 61 acres would be available for winter log. |
| B | 0 | --- | No winter haul planned. |
| C | 9,500 | --- | No winter haul planned. |
| D | 2,600 | --- | No winter haul planned. |
| E | 3,300 | 59,650 | 14 acres accessed with either alt. |
| Total Cost: | $24,500 | $75,800[3] | |

[1] Road construction and renovation cost does not include normal maintenance such as road grading or brush cutting, but does include all road construction, replacement or new culverts, and additional rock placed to allow winter haul under current ODF rules.

[2] Winter haul costs are for each unit as a stand alone operation.

[3] Total of winter haul column is cost for units with winter haul option, but not including duplicate costs where two or more units use same road system.

**Alternative Two**
Total road construction and renovation cost for summer haul only, under Alternative Two, would be $24,500.

Based on an estimated 1,660 MBF sale volume, appraised cost would be $10.29/MBF.

**Alternative Three**
Total road construction and renovation cost for winter operations would be $87,900.

Based on the estimated volume of 1,660 MBF, appraised cost would be $36.93/MBF. The additional expenditure of $63,400 would provide winter access to approximately 25 acres out of 160 acres, or roughly 16 percent of the project area.

**Cost explanation for winter haul:**
For access to Units A, B, and E, Road No. 30-7-5.0 needs additional cross drain culverts, and Road No. 30-7-8.0 needs additional cross drain culverts and 100cy of patch rock.

Unit A: One spur road, 7 stations, to be rocked.

Unit E: Road No. 30-7-6.0 needs cross drains and 40cy/sta. rock.

Unit E: Two spur roads,11 stations combined, to be rocked.

| Project Area/Unit: **Tater Tot CT** | Road Construction and Renovation Cost[1] | | |
|---|---|---|---|
| | Summer haul | Winter haul[2] | Comments |
| A | $3,600 | --- | No winter haul planned |
| B | 11,400 | 12,800 | 24 of 52 acres would be available for winter log. |
| C | 4,500 | 4,500 | Spur road surfaced with either alternative. 10 acre unit. |
| D | 7,950 | --- | No winter haul planned |
| E | 0 | --- | No winter haul planned |
| F | 0 | --- | No winter haul planned |
| G | 1,000 | --- | No winter haul planned |
| H | 0 | --- | No winter haul planned |
| I | 0 | --- | No winter haul planned |
| J | 0 | --- | No winter haul planned |
| K | 500 | 2,750 | 7 acres accessed with either alt. |
| L | 675 | 5,175 | 17 of 26 acres would be available for winter log. |
| M | 2,600 | --- | No winter haul planned |
| Total Cost: | $32,225 | $25,225[3] | |

[1] Road construction and renovation costs does not include normal maintenance such as road grading or brush cutting, but does include replacement or new culverts and additional rock placed to allow winter haul under current ODF rules.

[2] Winter haul costs are for each unit as a stand alone operation.

[3] Total of winter haul column is cost for units with winter haul option, but does not include summer haul road construction or duplicate costs where two or more units use same road system.

**Alternative Two**
Total road construction and renovation cost for summer haul only, under Alternative Two, would be $32,225.

Based on an estimated 2,700 MBF sale volume, appraised cost would be $11.94/MBF.

**Alternative Three**
Total road construction and renovation cost for winter operations would be $40,375.

Based on the estimated volume of 2,700 MBF, appraised cost would be $14.95/MBF. The additional expenditure of $8,150 would provide winter access to an additional 26 acres, bringing the total available for winter operations to approximately 67 acres out of 180 acres, or roughly 37 percent of the project area.

**Cost explanation for winter haul:**
Haul routes for this sale are either paved or have adequate rock base for the volume expected off of the sale. Additional grading/rocking may be needed during the course of the project, depending upon weather conditions during haul.

Unit B: One spur road, 1 station, to be rocked.

Unit C: For summer haul, spur does not need rock. Cost savings of $3750 possible.

Unit K: One spur road, 1.5 stations, to be rocked.

Unit L: One spur road, 3 stations, to be rocked.

| Project Area/Unit: **Wasted Days CT** | Road Construction and Renovation Costs[1] | | |
|---|---|---|---|
| | Summer haul | Winter haul[2] | Comments |
| A | $2,100 | --- | No winter haul planned |
| B | 1,650 | --- | No winter haul planned |
| C | 1,500 | 49,524 | 21 of 26 acres would be available for winter log. |
| D | 500 | 44,775 | 3 acres accessed with either alt. |
| E | 3,400 | 96,438 | 18 of 22 acres would be available for winter log. |
| F | 0 | 46,300 | 21 acres accessed with either alt. |
| G | 0 | 61,525 | 16 acres accessed with either alt. |
| Total Cost: | $9,150 | $155,662[3] | |

[1] Road construction and renovation costs does not include normal maintenance such as road grading or brush cutting, but does include replacement or new culverts and additional rock placed to allow winter haul under current ODF rules.

[2] Winter haul costs are for each unit as a stand alone operation.

[3] Total of winter haul column is cost for units with winter haul option, but not including duplicate costs where two or more units use same road system.

**Alternative Two**
Total road construction and renovation cost for summer haul only, under Alternative Two, would be $9,150. Based on an estimated 1,660 MBF sale volume, appraised cost would be $5.51/MBF.

**Alternative Three**
Total road construction and renovation cost for winter operations would be $171,613.

Based on the estimated volume of 1,660 MBF, appraised cost would be $103.38/MBF. The additional expenditure of $162,463 would provide winter access to approximately 79 acres out of 118 acres, or roughly 67 percent of the project area.

**Cost explanation for winter haul:**
Haul routes for this sale need additional culverts and rock to be winter ready.

To access Units C, D, E, F and G, Road No. 29-3-33.0 road needs additional cross drains and 100cy of patch rock. Road No. 29-3-27.0 needs additional cross drains and 200cy of patch rock.

For access to Units C, D and E, Road No. 29-3-35.4 needs cross drains and 40cy/sta. rock.

To access Units C and E, Road No. 29-3-35.0 needs cross drains and 15cy/sta. rock. Road No. 29-3-35.2 needs cross drains and 15cy/sta. rock.

Unit C: One spur road, 5 stations, to be rocked. One culvert to be installed.

Unit D: One spur road, 1.5 stations, to be rocked.

Unit E: One spur road, 8 stations, to be rocked.

# APPENDIX D
## CRITICAL ELEMENTS OF THE HUMAN ENVIRONMENT

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

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