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7th Paradise

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

ENVIRONMENTAL ASSESSMENT NO. OR090-03-11

7th Paradise Timber Sale

1.0 INTRODUCTION

1.1 Background and History

The Bureau of Land Management proposes to commercially thin approximately 140 acres of timber within the Matrix Land Use Allocation (LUA) and treat by density management approximately 60 acres of timber within the Riparian Reserve LUA. Harvest would take place within two stands with average ages of 52 and 59 years. Both age classes occur in both LUAs. Approximately 2,900 feet of existing road would be renovated and decommissioned, and approximately 5,500 feet of new road would be constructed and decommissioned. The project area is located in Section 3, Township 17 South, Range 7 West, Willamette Meridian, Lane County, Oregon in the Siuslaw Resource Area of the Eugene District of the Bureau of Land Management (BLM).

1.2 Purpose of and Need For The Action

The project area is within the Matrix LUA and has management objectives for General Forest Management Area (GFMA) and Riparian Reserves. The purpose of the proposed action is to meet planning objectives in the Matrix, which include: provide a sustainable supply of timber and other forest commodities to provide jobs; contribute to community stability; and meet Aquatic Conservation Strategy (ACS) Objectives. The need for the action is established in the Eugene District Record of Decision and Resource Management Plan (RMP) (June 1995), which directs that timber be harvested from Matrix lands to provide a sustainable supply of timber and that actions be taken to attain ACS objectives.

1.3 Conformance With Land Use Plan

All alternatives are in conformance with the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl (NSO ROD) (April 1994), and the RMP, as amended by the Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines, USDA Forest Service and USDI Bureau of Land Management, January 2001.

Additional site-specific information is available in the 7th Paradise Timber Sale project analysis file. This file and the above referenced documents are available for review at the Eugene District Office.

2.0 ISSUES SELECTED FOR ANALYSIS

Issue 1: ***How would timber harvest and associated activities affect Northern Spotted Owl dispersal habitat and Marbled Murrelet nesting habitat?***

The project area may be considered dispersal habitat for spotted owls and nesting habitat for marbled murrelets. Timber harvest could affect the project area's ability to function as habitat.

Issue 2: ***How would timber harvest and roads affect attainment of Aquatic Conservation Strategy (ACS) objectives at the watershed scale?***

The Proposed Action and alternatives incorporate the use of design features and selected Best Management Practices (BMPs) to insure the project proposal does not prevent or retard attainment of the nine ACS Objectives on a watershed or landscape scale.

Issue 3: ***What are the effects of roads and yarding on soil productivity?***

Yarding systems affect soil productivity and compaction in different ways. Applying selected BMPs listed in the RMP may ameliorate these impacts.

Issue 4: ***What are the costs and benefits of the different yarding methods?***

BLM Timber Sale Procedure Handbook 5400-1 advises that "...the contract will require the lowest cost methods to accomplish project objectives while providing, but not exceeding, the necessary or required level of environmental protection (e.g., not requiring a more expensive logging system to mitigate impacts below the level of impact anticipated in the relevant environmental impact statement (EIS) and land use plan...") (US Department of Interior, 2000). The costs of yarding methods could differ substantially. However, the amount of road construction and landing construction may also vary between logging methods.

3.0 ALTERNATIVES

Alternatives 1, 2, 3 and 4 consider timber harvest and other forest management activities on a project area of approximately 470 acres (see maps).

Table 1: Action Alternatives

	Alternative 1 Commercial Thin – No New Roads		Proposed Action Alternative 2 Commercial Thin – Long Span Cable		Alternative 3 Commercial Thin – Cable and Helicopter		Alternative 4 Regeneration Harvest – Cable and Helicopter	
	Acres	**Volume**	**Acres**	**Volume**	**Acres**	**Volume**	**Acres**	**Volume**
Upland Harvest	110		140		160		130	
Riparian Reserve Density Management	30		60		60		0	
Totals	140	1.4 MMBF*	200	2.3 MMBF	220	2.5 MMBF	130	4.3 MMBF
Construction & decommissioning of new roads	None		Spur C (3,300 ft) Spur D (1,700 ft) Spur E (500 ft)		None		None	
Renovation & decommissioning of existing roads	BLM Road No. 16-7-34.3 for a total of 2,900 feet							

*MMBF = million board feet

3.1 Design features Common to All Action Alternatives

Fuels Reduction

Fuels reduction would include covering and burning all landing piles and burnable fuel concentrations along project roads and spurs.

Retention

Down material of advanced decay (Decay Class 3, 4 or 5) would be retained for coarse woody debris (CWD).

Snags, Pacific yews, and hardwood trees would be retained where possible. Snags and hardwoods felled for safety reasons would be retained as CWD.

All trees not specifically identified for retention would be cut. Retention will be described in greater detail in **3.2 Design Features Common to Commercial Thin Alternatives** and **3.6 Regeneration Harvest**.

Reserves

The height of one site-potential tree has been determined to be 210 feet slope distance in the Long Tom Watershed. Riparian Reserves 210 feet wide on either side of non-fishbearing streams and 420 feet around fishbearing streams would be managed in accordance with the standards and guidelines in the NSO ROD (Appendix C, pp. 31-38).

Some skyline cable corridors may be needed through the untreated portions of the Riparian Reserves to gain the necessary suspension of logs during yarding. Cable yarding over Streams 5 and 21 may be needed and would require full suspension of logs over streams and streambanks. No other yarding of logs through these cable corridors is proposed. Cable corridor trees would be felled and left parallel to the stream to the

extent possible within the untreated Riparian Reserve area and retained on site to provide coarse woody debris.

Roads and Yarding

In order to slow the spread of noxious weeds, all yarding and road construction equipment, including excavators, would be cleaned prior to its arrival on BLM land.

BLM Road No. 16-7-34.3 would be renovated. Approximately 2,200 feet of this road would be used as a haul road. Approximately 700 feet would not be used as a haul road because the road gradient is too steep to allow loaded log trucks to begin uphill movement from a stopped position. Instead, the last section would be used as an equipment road/tractor swing: that is, a cable yarder would be walked along the road; logs would be cable yarded to the yarder; and a skidder would use the equipment road as a route for skidding logs from the cable yarder to the loading area. Upon completion of the project, the renovated road would be decommissioned and blocked.

A landing on private land to the north of the project area would be renovated for use as a turnaround for loaded log trucks.

Upon completion of operations (within 3 years), renovated and/or newly constructed BLM roads would be decommissioned and blocked in the following manner:

a) The road subgrades would be lifted and aerated with a track mounted excavator or winged subsoiler.

b) Water bars or drainage dips would be installed along the road where necessary.

c) Adequate drainage for any unmaintained road would be ensured.

d) Road surfaces would be blocked from all access points using barricades appropriate for the road.

e) Slash, boulders, and logging debris would be placed on road surfaces along as much of the length of the road as possible, including small diameter trees, if available.

All cable yarding would be to designated or approved landings using the following BMPs: A cable system capable of lateral yarding 75 feet would be used. Yarding corridors would not exceed 12 feet in width and would be 150 feet apart at the end farthest from the yarder. One-end suspension of logs would be required during cable yarding, and intermediate supports would be required where necessary to attain the required suspension.

3.2 Design Features Common to Commercial Thin Alternatives (Alternatives 1, 2, 3)

Silviculture

No site preparation would be needed. Harvested areas would not be planted.

Retention

Conifers would be thinned from below, retaining the larger diameter, more vigorous trees. Spacing would vary. Western redcedars would be retained where possible.

Units 1 and 2: Retain approximately 125 square feet of basal area per acre (BA/acre) by retaining an average of approximately 60 trees per acre (TPA).

Units 3 and 4 – younger stands: Retain approximately 100 square feet BA/acre or an average of approximately 100 TPA.

Units 3 and 4 – older stands, and Units 5 & 6 (where applicable): Retain approximately 125 square feet BA/acre by retaining an average of approximately 90 TPA.

Reserves

In Unit 2, a Ramalina (fungus) population would have a reserve around it of approximately 3/4 acre. This reserve would merge with the Riparian Reserve of Stream 21.

Approximately 60 Riparian Reserve acres would be treated by density management to the same densities as adjacent uplands. Riparian Reserves for Streams 5, 6, 21 and 23 would be treated to within approximately 150 feet of streams. Riparian Reserves for all other streams would be treated to within approximately 100 feet of the stream. For Units 3 and 4, an existing dirt road at the edge of the riparian zone would serve as the lower boundary between Streams 3 and 5.

Roads and Yarding

During yarding, log lengths would be limited to a maximum of 40 feet to protect retention trees. Unmerchantable tree tops and limbs would not be yarded to the landings and would be left on site to contribute to soil productivity.

3.3 ALTERNATIVE 1 – Commercial Thin (No New Roads)

This is a commercial thin alternative in which approximately 140 (30 Riparian Reserve, 110 GFMA) acres of a 470-acre project area would be treated. Approximately 1.4 MMBF of timber would be offered for sale.

Roads and Yarding

No new roads would be constructed. BLM Road No. 16-7-34.3 and Oregon Department of Forestry (ODF) Roads No. 17-7-4.2 and 17-7-4.3 would provide landing areas for a cable yarding system. Because many yarding corridors would converge at the ends of the ODF roads (in a wagon-wheel formation), many of the ODF-owned trees due east of the landings would be cut. Ground-based yarding is not proposed except for the tractor swing described in **3.1**.

All other design features would be as described in **3.1** and **3.2**.

3.4 ALTERNATIVE 2 - Commercial Thin (Long Span Cable) (Proposed Action)

This is a commercial thin alternative in which approximately 200 (60 Riparian Reserve, 140 GFMA) acres of a 470-acre project area would be treated. Approximately 2.3 MMBF of timber would be offered for sale.

Roads and Yarding

Approximately 5,500 feet of road would be constructed (Spurs C, D, and E). Spurs C and D would have a 14-foot subgrade and a natural surface with no ditch and outsloped, where possible. Spur C would include approximately 800 feet of ridgetop road construction and approximately 800 feet of full-bench road construction (see glossary) with short landing spurs to the ridgetop. Spur D would include approximately 1,000 feet of full-bench road construction and approximately 250 feet of ridgetop construction. Cut-and-fill construction (see glossary) would tie the full-bench road segments to the ridgetop segments. Spur E, a ridgetop road, would be approximately 500 feet long and would be an equipment road with a tractor swing, much like the last 700 feet of renovated Road No. 16-7-34.3 (see 3.1). Waste would be endhauled. Newly constructed and renovated roads would be blocked and waterbarred between logging seasons. Cable yarding would be from existing and newly constructed roads.

All other design features would be as described in **3.1** and 3.2.

3.5 ALTERNATIVE 3 - Commercial Thin (Aerial & Cable)

This is a commercial thin alternative in which approximately 220 (60 Riparian Reserve, 160 GFMA) acres of a 470-acre project area would be treated. Approximately 2.5 MMBF of timber would be offered for sale.

Roads and Yarding

This analysis assumes the use of a medium or heavy helicopter. Two existing landings on private land north of the project area would be used as log landings. Clearing of private timber may be needed for paths for ingress and egress. One landing of adequate size for a service landing exists on ODF Road No. 17-7-4.2. Roads No. 17-7-4.2, 17-7-4.3 (during the dry season), 16-7-34.1, and 16-7-34.3 may be used as drop zones for logs if needed.

Cable yarding would be expected to take place from existing roads where possible. Aerial lift by helicopter would remove logs from the remaining acreage. Approximately 120 acres may be cable yarded and 100 acres would require helicopter yarding. However, helicopter logging would be allowed for the entire proposed harvest area.

Because marbled murrelet habitat exists within 0.5 mile of the proposed harvest area, a seasonal restriction would be imposed on heavy helicopter use. No operations involving a heavy helicopter would be allowed between April 1 and August 5. Heavy helicopter operations could begin August 6, with a daily timing restriction that no operations could begin until 2 hours after sunrise, and operations must cease 2 hours prior to sunset. These daily timing restrictions would continue until September 15. Beginning September 16, heavy helicopter operations would have no restrictions due to murrelets until the following April 1.

All other design features would be as described in **3.1** and **3.2**.

3.6 ALTERNATIVE 4 – Regeneration Harvest (Aerial & Cable)

This is a regeneration harvest (see glossary) alternative designed to provide forest products and regenerate the stand. Approximately 4.3 million board feet (MMBF) of timber would be offered for sale. Approximately 130 GFMA acres of a 470-acre project area would be harvested. As in Alternative 3, a helicopter would be used to log a portion of the volume.

Silviculture

Site preparation would include covering and burning of heavier fuel concentrations throughout the harvest units.

Harvested areas would be planted at a density to produce full stocking of the future stand. Planted seedlings would be Douglas-fir, using improved stock from the Tree Improvement program if available.

Retention

Green trees would be retained at an average density of 6-8 TPA. Retention would favor minor conifer species and remnant seed trees and would reflect the range of diameters across the stand.

An additional 2 green conifer TPA greater than 20 inches in diameter would be retained for snags and would be scattered across the harvest area.

Upon completion of the project, 12 logs per acre at least 20 inches in diameter and 20 feet in length would be left on site for coarse woody debris.

Reserves

No harvest would take place in the Riparian Reserves. The *Ramalina* reserve would be expanded to approximately 3 acres.

Roads and Yarding

Approximately 80 acres could be cable yarded and 50 acres would require helicopter yarding. However, helicopter logging would be allowed for the entire harvest area

Additional design features for **Fuels Reduction**, **Retention**, **Reserves**, and **Roads and Yarding** would be as described in **3.1**. Additional design features for **Roads and Yarding** would be as described in **3.5**.

3.7 ALTERNATIVE 5 - No action

All timber harvest activities would be deferred; no management activities described under the action alternatives would occur, and no timber would be offered for sale at this time. Because the project area is within GFMA, a harvest may be proposed in the future.

3.8 ALTERNATIVE Considered but Not Analyzed

A Commercial Thin alternative using a short-span cable system was considered. This alternative would have involved construction of the roads proposed in Alternative 2, plus construction of Spurs B and B1 into Units 4 and 5. Spurs B and B1 would have required approximately 3,350 feet of new construction, some of which would have cut across the bottom of a landslide area, and which would have crossed two streams. Construction would result in cutbanks of approximately 25 feet above the road in some areas. Approximately 15 additional acres would have been accessed. For these reasons this alternative was dropped from further analysis.

4.0 EXISTING CONDITIONS

The plant and animal communities in this project area do not differ significantly from those discussed in the Eugene District Proposed Resource Management Plan/Environmental Impact Statement (RMP EIS) (Chapter 3). Some resources are discussed in greater detail in this section.

4.1 LONG TOM WATERSHED

The project area is in the Long Tom Watershed. The Long Tom Watershed is located in Lane and Benton Counties, west of Eugene. The watershed lies at the southwestern headwaters of the much larger Upper Willamette River Basin and contains approximately 263,000 acres.

The watershed landscape pattern is that of checkerboard ownership with approximately 22,000 acres (8%) managed by the BLM. The BLM forest lands are concentrated in the Coast Range foothills or "Valley Fringe". Forestry and agriculture are the primary land uses. Commercial forests are located primarily in the upper reaches of the watershed (Long Tom Watershed Analysis, October 2000).

Approximately 42% of the forested BLM administered lands within the watershed are in the 0-30 year age classes. Approximately 42% are in the 40 to 70 year age classes, and approximately 16% are in the late successional or 80 year and older age classes (Based on Forest Operations Inventory (FOI) stand data 1999).

4.2 Timber

The project area is revested Oregon and California Railroad land, acquired by the government in 1938. The BLM has no record of any management activity on most of the project area, though it was logged and burned, probably during the 1930's. The younger portion of the project area was logged in the late 1950's and was planted in 1960. No other management activities in the project area are known.

The common stand condition is a well-stocked overstory of Douglas-fir. Conifer stocking is such that tree diameters vary considerably in different areas of the stand. Some portions of the stand have lower conifer stocking due to the presence of bigleaf maples. Chinkapin and madrone are found in hardwood patches on ridgetop locations, and also within the conifer stand, where they have long been overtopped and are either dead or of poor vigor.

Riparian areas are generally dominated by alder and bigleaf maple with a salmonberry understory. Upland portions of the Riparian Reserves are similar to the adjacent Matrix stand conditions.

Large snags (greater than 20" dbh) are sparse thoughout the stand. Large coarse wood, primarily a remnant of prior logging, is found at low density.

A stand exam completed in February of 1999 indicates the following information: for Units 1 and 2, the average age is 59 years old, average diameter is 14 inches at breast height, and there are approximately 250 TPA (175 conifers per acre). For Units 3-6, the average age is 52 years old, the average dbh is 13 inches, and there are approximately 265 TPA (220 conifers per acre).

4.3 Wildlife (including Special Status and Special Attention Species)

Threatened and Endangered Species

Northern Spotted Owl (Threatened)

Currently there are 36,000 acres (56%) of dispersal habitat for the Northern Spotted Owl in federal ownership within the forested portion of the Long Tom Watershed. Although

exact figures are difficult to obtain, private and State lands provide additional dispersal habitat for the owl. Dispersal habitat for owls consists of conifer forests with at least 40% cover that function for roosting and foraging, but could lack suitable structure for nesting (usually between 40-80 years old). Stands within the project area provide temporary habitat for transient owls searching for a longer term territory and may also provide foraging habitat for nearby owl territories (in Section 33 to the north, and Sections 9 and 5 to the west and south). There are no Spotted Owl activity centers or designated Critical Habitat within 0.5 miles of the proposed harvest areas. The nearest owl nest site is over 1.5 miles away from the project area.

Marbled Murrelet (Threatened)

No suitable or potential habitat exists within 0.25 mile of the project area, and the project area is not capable of becoming suitable habitat within 20 years in the absence of treatment. Suitable habitat does exist within 0.5 mile of the project area. Suitable nesting habitat for Marbled Murrelet consists primarily of old growth and mature coniferous forests. Murrelets also have been found in younger forests (60-80 years) with structural elements similar to old growth, such as remnant old-growth trees or younger trees with platforms created by deformities or dwarf mistletoe infestations (Nelson 1997, Nelson and Wilson 2001).

Survey and Manage Species

Mollusks

Survey and Manage (S&M) mollusk species previously requiring surveys included one snail and two slugs: the Oregon Megomphix (*Megomphix hemphilli*), papillose taildropper (*Prophysaon dubium*), and the blue-grey taildropper (*Prophysaon coeruleum*). These species have been removed from the S&M list in the Coast Range Resource Area (USDA &USDI, 2001), and no longer require pre-project surveys. Mitigation measures are still required for Megomphix sites discovered prior to October, 1999. There are no known Survey and Manage mollusk sites within the project area and no surveys have been conducted for mollusks. Effects to these species will not be analyzed in this document

Red Tree Vole

The project area falls within the central part of the Red Tree Vole's range. As a result of the 2001 Annual Survey and Manage Species Review, pre-disturbance surveys are no longer necessary for Red Tree Voles in the central part of its range (Category D). Also, new information indicates that additional identification of sites within Matrix lands is not necessary to ensure persistence of this species. Therefore, effects to this species will not be analyzed in this document.

Other Wildlife

This project area provides habitat for a variety of species that utilize mid-seral forest habitat. For a list of species that may occur here, refer to Table 3-54 in the RMP (page 3-52).

4.4 Soils

Geology/landslides

The project area is geologically mapped within the Flournoy/Tyee (Tt) Formation that consists of massive and rhythmically bedded feldspathic and micaceous sandstone and subordinate siltstone. Each bed is graded and ranges from coarse sandstone at the base to fine sandstone and siltstone above. The Tyee formation is widespread in the central Coast Range. Within this sandstone unit is an igneous bedrock (Ti) outcrop in the southwest and southeast quarter of the section and includes Iron Mountain (Walker and Macleod, 1991). East of Section 3 is a mapped fault. Poodle Creek generally follows the faultline before draining into the Long Tom River drainage. Topographically, Section 3 is cut east-west by Jack Hays Creek and the section is mapped as being within an anticline where the land has been uplifted.

Field reconnaissance indicates that slopes along streams are steep (>70%). Relief from stream bottom to upslope is rarely broken by a break in slope. Exposed rock is present along some of the draws and the presence of many pistol-butt trees is a helpful index to the active movement of the soils. Soils are moderately deep to shallow and side slope failures are present. Down slope depressions or pockets of residual soil are found in mid-slope positions. Some larger rotational slump landslides are present, including the headwall of Stream 5 and side slope of Stream 6. Debris avalanches are common to the Coast Range, and occurrences would be predictable along steep slopes. Stream 23 has evidence of a debris flow reaching the main stem of Jack Hays Creek.

Soils/compaction/erosion

Predominant soils found in the project area include Bellpine, Digger, Hullt, Preacher, and Willakenzie (U.S.D.A. 1987). Smaller acreages of Blachly, Bohannon, Meda and Nekoma are also present. Predominant soils are moderately deep and have a high Site Index that correlates to a high amount of on-site nitrogen and potential site productivity. All soils are susceptible to compaction.

Bellpine soils are moderately deep (27-37 inches). The surface layer is a silty clay loam, and the subsoil is a silty clay that may contain between 25-55% clay. Permeability is moderately rapid and runoff is rapid with hazard of erosion being high. This soil is subject to slumping, particularly on cut slopes where road cuts are made on steep slopes.

Digger soils are moderately deep (27-37 inches). The surface layer is a gravelly loam, and the subsoil may contain 15-25% clay. The surface may be littered with stones. Permeability is moderately rapid, and runoff is rapid with hazard of erosion being high. Because Digger soils tend to develop on steep slopes, there is a high hazard of erosion and slumping in disturbed areas. Windthrow is a hazard when the soil is wet and winds are strong. Disturbed areas are subject to rill and gully erosion and sloughing.

Hullt soils are moderately deep (40-60 inches). The surface layer is a loam and the subsoil a silty clay loam with 20-35% clay contents. Permeability is moderate and runoff is rapid with hazard of erosion being high. Construction and maintenance of roads is difficult because of steepness of slope and hazard of landslides.

Preacher soils are moderately deep (36-54 inches). This soil is a clay loam with 20-35% clay contents. Permeability is moderate and runoff is rapid with hazard of erosion being high. The most common slope failure is of the slump and earthflow type. The most unstable areas are the steep, concave slopes at the heads of drainages.

Willakenzie soils are moderately deep (20-40 inches). This soil is a clay loam with 27-35% clay contents. Permeability is moderately slow and runoff is slow to medium with hazard of erosion being moderate.

Field reconnaissance indicated that there are pockets of very unstable soils, slumping and raveling slopes. Evidence of the previous harvest entry is obscured by the gravitational downslope movement of earth.

4.5 Aquatic and Riparian Resources and Fisheries

Aquatic and Riparian Resource Characterization

The project area is located within the headwaters of the Elk Creek sub-watershed. This sub-watershed is approximately 17,000 acres. The main drainage in this project area is Jack Hays Creek, a 4th order stream that flows into Poodle Creek. The Jack Hays Creek drainage area is approximately 1,600 acres and is predominately forested with 40-60 year-old stands. Approximately 5-10% of the drainage area is in young forest (0-15 years old). Approximately 30% of the sub-watershed is currently young forest (0-15 years old), agricultural, or rural residential. The rest of the sub-watershed is forest land that is currently 16-80 years old.

The proposed harvest areas vary from approximately 0.5-1.0% of the total sub-watershed area, and from approximately 8-14% of the total drainage area. Road density in the sub-

watershed is approximately 4.5 miles/square mile. Road density in the drainage is a relatively low 2.4 miles/square mile.

There are 23 streams within or adjacent to the project area; all drain toward Jack Hays Creek. The surveyed streams vary from small, intermittent, headwater streams (1st order) up to a 4th order perennial stream (Jack Hays Creek). Most stream reaches within the project area are greater than 15% gradient except for the lower portions of some of the main streams (1, 5, 6, 10, 16, 17, 21, and 22—see attached maps). Most streams surveyed have a low to moderate density of large woody debris. Existing stream canopy cover is good; most of the streams have 70-90% (or greater) canopy cover. The riparian areas of most of Streams 4, 11, 21, and 22, and the lower reaches of Streams 1, 10, and 16 are dominated by hardwoods.

Channel down cutting or channel aggrading does not appear to be a notable problem on the surveyed reaches. Bank stability appears to be fair to good, although some banks are steep. Stream 23 has channel scour from a previous headwater slope failure. A small debris pile is located in the lower reach of Stream 23 approximately 200 feet above Stream 22. A few streams (4, 20 and 23) have discontinuous areas of channel scour where flow is subsurface.

Topography in the project area varies from 0-100% slope gradient, with much of the area at 45-85%. Fairly broad, moderately sloped ridges are located in all of the proposed harvest areas. The floodplains along Streams 10, 21, 22, and the lower reaches of Streams 1, 5, 6, and 16 are moderately wide and gently sloped. Most of the remaining topography in the project area is moderately steep to steep.

Road No. 16-7-34.3 is a ridge-top dirt road that bisects Unit 3 and is proposed for renovation. Road No. 17-7-2.1 is a valley bottom dirt road that is not proposed for use in this project. Neither road is currently passable. Road No. 17-7-2.1 includes several old log culvert stream crossings (Streams 1, 3, 4, 5, 6, and 16), some of which have partially failed. Stream 5 has formed a channel in this road, and flow is diverted down the road bed for 175-200 feet to Stream 21. Some erosion of the road has occurred along this section.

Elevations in the project area vary from approximately 700-1,480 feet. Rain-on-snow events in the Coast Range are unusual at elevations below 1,500 feet. The closest filed water rights are for irrigation rights on Poodle Creek approximately 4 miles downstream from the project area.

Fisheries Characterization

Jack Hays Creek contains spawning and rearing habitat for cutthroat trout, sculpin, dace, redside shiner and western brook lamprey. There are no anadromous fish found in the Long Tom Watershed above Fern Ridge Reservoir.

Upstream from the confluence of the north fork of Jack Hays Creek (Stream 21), the south fork (Stream 22) meanders through a large flood plain. In this area of the south fork there are substantial deposits of small and large gravel, suitable for use as spawning substrate for fish species. The smaller, steeper streams generally have substrate that is fine material to medium gravel with areas of bedrock. All sizes of down wood are incorporated into numerous medium and large log jams. Deep scour and plunge pools are associated with these jams and provide excellent cover habitat for fish species. Large second-growth Douglas-fir are being recruited from the adjacent riparian area.

The unnamed tributaries (Streams 1-20 and 23) flow through steep narrow valleys constrained by hillslopes. These small streams generally stairstep over logs (less than 12 inch diameter), small boulders (1-3 foot diameter) and cobble (6-12 inch diameter). The majority of the unnamed tributaries are non-fishbearing due to high stream gradient and physical barriers. Prominent habitat types include cascades, riffles and small pools. A presence/absence fish survey, utilizing netting and visual observation, was conducted along Streams 1-23. Results are shown in Table 2.

Table 2: Fish Presence/Absence

Stream	Presence	Description
1	Present	Cutthroat trout present in Tributary 1 for a distance of approximately 420 feet upstream from the road/ culvert. Physical barrier.
10	Present	Cutthroat trout present in Tributary 10, from the confluence with the South Fork Jack Hays Creek for a distance of approximately 460 feet upstream. Physical barrier.
21	Present	Cutthroat trout and sculpin species present in the North Fork of Jack Hays Creek
22	Present	Cutthroat trout and sculpin species present in the South Fork of Jack Hays Creek
2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 23	Absent	No fish species present

4.6 Botany

Native Plants, Special Status, and Survey & Manage Species

Surveys were conducted in the project area for federally listed Threatened or Endangered, BLM Special Status, and Survey and Manage plants, lichens and bryophytes. Surveys for vascular plants occurred in 1998, 1999, and 2002. Some areas are yet to be surveyed for vascular plants: the upper halves of Units 3 and 4, and Units 5 and 6. Surveys will be conducted summer 2003. Any Threatened or Endangered, Special Status, or Survey and Manage plants, lichens, or bryophytes would be managed in accordance with Management Recommendations.

Surveys for lichens and bryophytes occurred in 1999 and 2002. These surveys covered the entire project area, except for the riparian area of Jack Hays Creek. This area will be surveyed in Summer 2003.

The area is mid-seral Douglas-fir forest, with western hemlock and western red cedar. Understory species include salal, dwarf Oregon-grape, vine maple, sword fern, and rhododendron. Several orchids and herbaceous *Ericaceae* occur, including *Monotropa uniflora*, *M. hypopithys*, and *Cephalanthera austiniae*. Early-successional species also occur in the area, including *Bromus vulgaris* and *Lotus aboriginus*, particularly in the larger gaps with downed trees. Numerous large, relatively old red alder and bigleaf maple occur in the Jack Hays Creek riparian area, providing habitat for lichens, possibly including Survey and Manage species such as *Platismatia lacunosa* and *Cetrelia cetrarioides*.

No federally listed or Special Status species were located during surveys, but two Survey and Manage species were found: *Ramalina thrausta* (1 site, category A) and *Usnea longissima* (2 sites, category F).

Noxious Weeds

Weeds located during plant surveys include bull thistle, Canada thistle, tansy ragwort, and common St. John's-wort. These noxious weeds are commonly scattered along roadsides in the Siuslaw Resource Area. All are perennial herbs, and biocontrol measures are often used to control them. Meadow knapweed is located on a roadside about 2 miles from the project area. This knapweed is more aggressive and difficult to control than the previously mentioned plants.

4.7 Recreation

Recreational activities within the project area consist of dispersed use. The most common activity is hunting. There is no evidence of OHV activity within the project area.

4.8 Visual Resources Management

The visual resource management class for this project area is IV, which allows major modifications of the existing character of the landscape. The project area currently is entirely covered with trees and vegetation except for Road Nos. 16-7-34.3 and 17-7-2.1. There are no structures within the sale area or large bodies of water, such as lakes. This project area is basically hidden from view from nearby drivable roads due to terrain and elevation. Because of these conditions, key observation points were not established.

5.0 DIRECT AND INDIRECT EFFECTS

5.1 UNAFFECTED RESOURCES

The following resources are either not present or would not be affected by any of the alternatives: Areas of Critical Environmental Concern; prime or unique farm lands; Native American religious concerns; solid or hazardous wastes; Wild and Scenic Rivers; Wilderness; minority populations; recreation; visual resources management; bald eagle habitat; and low income populations.

5.2 Issue 1: *How would timber harvest and associated activities affect Northern Spotted Owl dispersal habitat and Marbled Murrelet nesting habitat?*

Spotted Owl

Alternatives 1-3 would degrade 140-220 acres (out of 36,600 in the watershed) of dispersal habitat for the Northern Spotted Owl by opening up the canopy and possibly disturbing downed wood that provides habitat for its prey base. Although thinning would temporarily degrade habitat conditions, the overall canopy closure would remain above 40% and harvested areas would still function as low quality dispersal habitat. Although there would be short-term negative effects of opening the canopy (10-20 years), thinning of the stand would accelerate the development of older forest characteristics that provide suitable nesting habitat for owls. Those trees outside of Riparian Reserves would be subject to commercial harvest rotations (approximately 80 years) typical in Matrix lands, which could occur here in as little as 30 years.

Alternative 4 would remove approximately 130 acres of northern spotted owl dispersal habitat, a change of less than 1% within the watershed. This area would most likely continue to provide adequate dispersal habitat for the spotted owl, although the spatial arrangement of this habitat will change over time as harvests continue and other stands mature.

Modification of dispersal habitat associated with the action alternatives would be considered a “May Affect, but is Not Likely to Adversely Affect” for the northern spotted owl.

The use of helicopter yarding has the potential for impacts to nesting owls within 0.5 mile due to noise and wind associated with rotor wash. However, there are no known spotted owl activity centers and no un-surveyed suitable habitat within 0.5 mile of the project area. Therefore, there would be no disturbance to owls from the proposed cable and helicopter yarding associated with the action alternatives.

In the short term, Alternative 5 would not affect dispersal habitat of the northern spotted owl. In the long term (30+ years), development in the Riparian Reserves of older forest characteristics and their associated benefits to spotted owls would occur more slowly than with Alternatives 1-3, through natural disturbance processes and forest succession. Because most of the project area is in the GFMA LUA, a harvest may be proposed in the future.

Marbled Murrelet

Because there is no suitable marbled murrelet habitat within the proposed harvest areas, Alternatives 1-3 would cause no short-term effects to marbled murrelets from habitat modification. Density management within the Riparian Reserves would hasten attainment of late-seral characteristics necessary to provide suitable nesting habitat for murrelets, a positive, long-term effect.

Because there is no suitable marbled murrelet habitat within the proposed harvest areas, Alternative 4 would cause no short-term effects to this species from habitat modification. Within the Riparian Reserves, attainment of late-seral characteristics necessary to provide suitable nesting habitat for murrelets would occur more slowly than with Alternatives 1-3 because there would be no Riparian Reserve treatment.

No suitable or potential habitat for marbled murrelets exists within 0.25 mile of the project area or haul route. Although potential habitat exists within 0.5 mile of the project area, there are restrictions on heavy helicopter use. Therefore, disturbance from Alternatives 1-4 "May Affect, but is Not Likely to Adversely Affect" marbled murrelets.

Under Alternative 5, no potential or suitable habitat for Marbled Murrelet would be modified or affected by disturbance. Within the Riparian Reserves, effects on attainment of late-seral characteristics necessary to provide suitable nesting habitat for murrelets would be similar to Alternative 4. Because most of the project area is in the GFMA LUA, a harvest may be proposed in the future.

5.3 Issue 2: *How would timber harvest and roading affect attainment of Aquatic Conservation Strategy (ACS) objectives at the watershed scale?*

Objective 1: All alternatives would maintain the distribution, diversity, and complexity of watershed and landscape-scale features in relation to the aquatic systems. Alternatives 1, 2, and 3 would have the potential benefit of hastening the development of late-successional characteristics of the Riparian Reserve residual stand because of the density management that would occur.

Objective 2: All alternatives would maintain the spatial and temporal connectivity within and between watersheds. Drainage network connections would be protected by untreated reserves on all streams and other hydrology features (at least 100 feet for the commercial thinning alternatives (1-3), 210-420 feet for the regeneration harvest alternative (4)); no new stream crossings would be constructed under any alternative; and yarding corridors over Streams 5 and 21 would not impact drainage network connections. Therefore, the existing chemical and physical routes would be retained, maintaining current connectivity.

Objective 3: All alternatives would maintain the physical integrity of the aquatic system. The commercial thinning alternatives (1-3) with density management of the Riparian Reserves would contribute to the restoration of the physical integrity of the aquatic system by developing larger trees more quickly than Alternatives 4 and 5, which propose no treatment of Riparian Reserves. All action alternatives propose some cable logging over Streams 5 and 21; the requirement of full suspension over streams and streambanks would ensure that streambank integrity or tree/shrub root strength would not be impaired. Trees cut for cable corridors in the untreated Riparian Reserves would be left on site and would have very little impact on the physical integrity of the aquatic system because few trees within the untreated Riparian Reserves would be cut with the vast majority (at least 95%) retained.

Objective 4: All alternatives would maintain the water quality necessary to support healthy aquatic, riparian, and wetland ecosystems. The potential for action alternatives to impact stream temperatures is low because of the reserves around all streams. The proposed yarding corridors across Streams 5 and 21 would have little to no effect on stream temperatures because of the narrow width of the corridors. Water quality would be protected by the full suspension of logs across the stream channels and stream banks. The risk of hazardous material reaching a hydrologic feature is very low as standard precautions and procedures would be implemented.

Objective 5: All alternatives would maintain the sediment regime under which this aquatic ecosystem evolved. Increases in erosion/sedimentation from the action alternatives are expected to be low due to the BMPs. Alternatives 2, 3 and 4 would have a greater risk of sedimentation than Alternative 1 because of road construction (Alternative 2) and more volume hauled (Alternative 4, with the most volume and the most risk). However, in all cases this risk would be very low because of the filtering effect of untreated Riparian Reserves around all streams. Alternative 5 would have no risk of increased erosion or sedimentation.

Objective 6: All alternatives are likely to maintain in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The risk of rain-on-snow events of large magnitude is unlikely at these elevations. All action alternatives might contribute to an increase in summer low flows, overall water yield, and peak flows because of a reduction in evapotranspiration and interception due to the removal of trees. Changes in water yield due to forest management activity are usually too small to be measured and are generally detectable only in the immediate proximity of harvested units. Measurable increases have occurred in some stream studies where more than 20% of the forest cover has been removed. Peak flow effects are expected to gradually diminish within a few to several decades. These effects would increase with the number of trees removed. Of the action alternatives, Alternative 1 would have the least effect, then Alternative 2, then 3, and finally Alternative 4 would have the greatest effect. Road and compaction effects on peak flow would be similar to slightly higher for Alternative 2 than the other alternatives due to construction of temporary roads. However, all action alternatives would have the benefit of reducing existing compaction by decommissioning Road No. 16-7-34.3. Alternative 5 (no action) would not alter the existing low flow, peak flow, or water yield, nor reduce the compaction existing on Road No. 16-7-34.3.

Objective 7: All alternatives would maintain the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands. For the action alternatives, much of the vegetative cover of the project area would be retained and most of the riparian vegetation would remain undisturbed within the untreated Riparian Reserves.

Objective 8: All alternatives would maintain the species composition and structural diversity in riparian areas and would maintain the amount and distribution of coarse woody debris sufficient to sustain the present physical complexity and stability of the riparian areas. Due to salmonberry competition, natural tree regeneration may be difficult in the 12-foot wide yarding corridors that would occur across Stream 21. Treatment of portions of the Riparian Reserves with Alternatives 1-3 would cause a reduction in the canopy closure for the short term, which could result in some micro-climatic alteration or other adverse effects for species that prefer complete canopy closure or that do not tolerate disturbance. Any such effect would be minor because of the residual trees, the extensive untreated areas, and because of the current poor habitat condition of the stands for most late-successional dependent wildlife species. Ultimately, Alternatives 1-3 would hasten the development of late-successional characteristics in the Riparian Reserves.

Objective 9: All alternatives would maintain the existing habitat of native plant, invertebrate, and vertebrate riparian-dependent species. Alternatives 1-3 may also contribute to the restoration of habitat for native plant, invertebrate, and vertebrate riparian-dependent species. Treatment of the outer portions of the Riparian Reserve (Alternatives 1-3) would accelerate late-successional forest characteristics that would benefit riparian-dependent species in the long term, and untreated portions of the Riparian Reserves would continue to provide habitat for these species in the short term. Alternatives 4 and 5 would not have this benefit.

Although the Jack Hays Creek corridor would be surveyed to protocol prior to cutting of cable corridors through riparian hardwoods, there may still be an effect to undetected individual Survey and Manage canopy lichens because of a loss of riparian hardwoods and a difficulty in regenerating them in areas with strong salmonberry competition. However, any Survey and Manage canopy lichens found would be managed in accordance with management recommendations.

Based on the above analysis of the effects on attainment of the ACS objectives, all alternatives are consistent with the ACS and objectives for the Riparian Reserves and would not prevent or retard the natural rate of attainment of any of the ACS objectives. Alternatives 4 and 5 would not enhance attainment of ACS objectives as quickly as the

others as they would not hasten development of large conifers in the Riparian Reserve. The stands would continue to develop and mature more slowly without treatment.

5.4 Issue 3: *What are the effects of roads and yarding on soil productivity?*

Slope Stability

There are no slope stability concerns for Alternatives 1-3 or 5. Alternative 4 would have the greatest potential for landsliding following harvest. Reduction in root strength on steep slopes following regeneration harvest can lead to higher frequencies of landslides the first few years following timber harvest. Potential landslide sites at this project area are steep (> 70%), in concave positions over hard bedrock. These sites usually occur in stream headwalls. Riparian Reserves would not be treated in Alternative 4; this would help reduce the probability of failures in those slope positions.

Road Impacts: Sedimentation

None of the alternatives would cause a direct effect of sedimentation or an indirect effect to water quality. Direct effect of traffic on forest roads is an increase in sedimentation to streams. Indirect effects from log haul might include water quality degradation from sedimentation. However, because haul routes are primarily ridge roads with adequate drainage, with few stream crossings that are not paved, and this project area is located in the Coast Range where organic matter and vegetation are good filtration for sediment, the risk to water quality impacts is greatly reduced.

Soil Compaction/Site Productivity

The direct effect of building and renovating roads and/or cable logging is soil compaction. The indirect effect is a loss in site productivity through compaction and soil displacement. Through the use of the BMPs, soil compaction would not exceed the allowable areal extent (2%) for any of the alternatives, assuring productivity losses of less than 1%. The nutrient status of the forest would benefit from logging slash left on the forest floor from any of the action alternatives.

For all action alternatives, site productivity would be temporarily affected along the extent of renovated Road No. 16-7-34.3; decommissioning upon completion of harvest would promote a return of site productivity.

Helicopter yarding is not known to have an effect on site productivity due to compaction except at designated landings. Helicopter logging would most likely result in more slash on the forest floor than would cable logging.

Table 3: Allowable Compaction by Alternative

	Alternative				
	1	**2**	**3**	**4**	**5**
Allowable Areal Extent of Compaction after amelioration (2%)	≤2.8 Acres	≤4.0 Acres	≤4.4 Acres	≤2.6 Acres	≤0 Acres

Alternative 3 would have the greatest amount of allowable areal compaction (4.4 acres), then Alternative 2 (4 acres), Alternative 1 (2.8 acres), and finally Alternative 4 would have the least amount (2.6 acres) of the action alternatives. However, design features would minimize compaction for all alternatives. Alternative 2 would have a greater effect on soil compaction than Alternative 1 because there would be 5,850 feet of new road construction and more cable logging. Decommissioning of newly constructed roads along with renovated Road No. 16-7-34.3 would promote a return of site productivity. Alternative 3 would have a greater effect on soil compaction than Alternative 1 because more area would be cable logged. In spite of more acres logged in Alternative 3, it would

have less of an effect than Alternative 2 because there would be no new road construction and helicopter logging would replace some of the cable logging. Of all action alternatives, Alternative 4 would have the least effects on compaction from cable logging because approximately 80 acres would be cable logged, much fewer than the other action alternatives.

Alternative 5 would have the least impact of all alternatives. No additional soil compaction or soil displacement would occur because no harvesting or new road construction would be conducted. No additional haul would occur on forest roads; thus downstream impacts to water quality from traffic on forest roads would remain at current levels. This alternative would have the least effect on soil productivity of all alternatives.

5.5 Issue 4: *What are the costs and benefits of the different yarding methods?*

Using the Helipace program, helicopter logging is estimated to cost in the range of $300-600/MBF (thousand board feet) for a commercial thin (Alternative 3) and $280-570/MBF for regeneration harvest (Alternative 4). Three analyses were completed for each alternative, using three different helicopters: the K-MAX, the S-58T, and the Bell 204 class.

The appraised cost of cable logging on two recent commercial thinning projects sold in the Eugene District (Jasper Creek, Hobart Butte) is approximately $150/MBF. It is reasonable to expect that Alternatives 1 and 2 would cost somewhere in this range using cable logging. An added cost for Alternative 1 would include additional haulback line due to some excessive yarding distances. The appraised cost of cable logging on the most recent regeneration harvest (Badger One) was $50/MBF.

A non-monetary cost of Alternative 1 would be the impact of the convergence of yarding corridors on the two State-owned landings to the west of the project area (Road Nos. 17-7-4.2 and 17-7-4.3). Approximately 17 yarding corridors to each landing would be needed to access all of the area to be logged from these landings. This would most likely result in harvest of several trees on State land between the landings and the BLM proposed harvest area.

The benefits of conventional yarding methods include lower economic cost. For Alternative 2, there would be more road and landing construction for cable yarding methods versus helicopter yarding.

The benefits of helicopter yarding include a faster yarding operation, more volume harvested, and, when compared to Alternative 2, no road construction.

Residents of a home located in the section east of and adjacent to the project area may object to the noise produced during helicopter operations. The noise would be louder than that produced by cable logging operations, but of shorter duration.

5.6 Summary of Effects

Table 4: Summary of Effects

	Alternative				
	1	**2**	**3**	**4**	**5**
Pertinent Design Features →	• Commercial Thinning Uplands • Cable yard • No new roads • Renovate & decommission Road No. 16-7-34.3 • Density Management Riparian Reserves (RRs) • Cable corridors through RRs and yarding over Streams 5 and 21 • Seasonal restriction Apr 15-Jun 15 for sap flow • Use of Rd 17-7-4.3 would be restricted to "dry season"	• Commercial Thinning Uplands • Cable yard • 5,500 feet road construction (natural surface) • Renovate & decommission Road No. 16-7-34.3 • Density Management RRs • Cable corridors through RRs and yarding over Streams 5 and 21 • Seasonal restriction Apr 15-Jun 15 for sap flow • Use of Rd 17-7-4.3 would be restricted to "dry season"	• Commercial Thinning Uplands • Aerial and Cable yard • No new roads • Renovate & decommission Road No. 16-7-34.3 • Density Management RRs • Cable corridors through RRs and yarding over Streams 5 and 21 • Seasonal restriction Apr 15-Jun 15 for sap flow • No heavy helicopter use April 1-Aug 5; daily timing restriction Aug. 6-Sept. 15 for MAMU nesting season • Use of Rd 17-7-4.3 would be restricted to "dry season"	• Regeneration Harvest Uplands • Aerial and Cable yard • No new roads • Renovate & decommission Road No. 16-7-34.3 • Density Management RRs • Cable corridors through RRs and yarding over Streams 5 and 21 • Seasonal restriction Apr 15-Jun 15 for sap flow • No heavy helicopter use April 1-Aug 5; daily timing restriction Aug. 6-Sept. 15 for MAMU nesting season • Use of Rd 17-7-4.3 would be restricted to "dry season"	• No Action
Issue ↓					
How would timber harvest and associated activities affect NSO habitat and MAMU nesting habitat?	**NSO:** • Degrade 140 acres Dispersal Habitat for 10-20 years • Accelerate development of suitable nesting habitat in RRs • No disturbance effects due to distance **MAMU:** • Accelerate attainment of late-seral characteristics (LSCs) in RRs • No disturbance effect due to distance • No habitat degradation	**NSO:** • Degrade 204 acres Dispersal Habitat for 10-20 years • Accelerate development of suitable nesting habitat in RRs • No disturbance effects due to distance **MAMU**: • Accelerate attainment of LSCs in RRs • No disturbance effect due to distance • No habitat degradation	**NSO:** • Degrade 220 acres Dispersal Habitat for 10-20 years • Accelerate development of suitable nesting habitat in RRs • No disturbance effects due to distance **MAMU**: • Accelerate attainment of LSCs in RRs • No disturbance effect due to seasonal restriction • No habitat degradation	**NSO:** • Remove 130 acres Dispersal Habitat for 40-50 years, <1% change in habitat No acceleration of development of suitable nesting habitat • No disturbance effects due to distance **MAMU**: Slower attainment of LSCs in RRs • No disturbance effect due to seasonal restriction • No habitat degradation	**NSO:** • No degradation of Dispersal Habitat resulting from this proposal • No acceleration of development of suitable nesting habitat • No disturbance effects **MAMU**: • Slower attainment of LSCs in RRs • No disturbance effect • No habitat degradation

	Alternative				
	1	2	3	4	5
How would timber harvest and roading affect attainment of Aquatic Conservation Strategy (ACS) objectives at the watershed scale?	**OBJ 1** • Maintain • Hasten LSC in 30 acres RR	**OBJ 1** • Maintain • Hasten LSC in 60 acres RR	**OBJ 1** • Maintain • Hasten LSC in 60 acres RR	**OBJ 1** • Maintain • No hastening of LSC in RR	**OBJ 1** • Maintain • No hastening of LSC in RR
	OBJ 2 • Maintain due to untreated RR	**OBJ 2** • Maintain due to untreated RR	**OBJ 2** • Maintain due to untreated RR	**OBJ 2** • Maintain due to untreated RR	**OBJ 2** • Maintain
	OBJ 3 • Maintain due to untreated RR • Hasten LSC in 30 acres RR	**OBJ 3** • Maintain due to untreated RR • Hasten LSC in 60 acres RR	**OBJ 3** • Maintain due to untreated RR • Hasten LSC in 60 acres RR	**OBJ 3** • Maintain due to untreated RR • No hastening of LSC in RR	**OBJ 3** • Maintain • No hastening of LSC in RR
	OBJ 4 • Maintain • Low risk to water quality	**OBJ 4** • Maintain • Low risk to water quality	**OBJ 4** • Maintain • Higher risk to water quality due to helicopter refueling, but still low risk	**OBJ 4** • Maintain • Higher risk to water quality due to helicopter refueling, but still low risk	**OBJ 4** • Maintain
	OBJ 5 • Maintain due to BMPs • Low risk of sedimentation	**OBJ 5** • Maintain due to BMPs • Sedimentation risk ≥Alt 1 due to road construction, more volume hauled (more traffic)	**OBJ 5** • Maintain due to BMPs • Sedimentation risk ≥Alt 1 due to more volume hauled (more traffic); ≥Alt 2	**OBJ 5** • Maintain due to BMPs • Sedimentation risk ≥Alts 1, 2, 3 due to most volume hauled (most traffic)	**OBJ 5** Maintain
	OBJ 6 • Maintain • #4 in effects on flows and water yield due to tree removal and lower evapotranspiration, interception • Reduce existing compaction via Rd 16-7-34.3 decomm	**OBJ 6** • Maintain • #3 in effects on flows and water yield due to tree removal and lower evapotranspiration, interception • Higher effect on peak flows from road construction • Reduce existing compaction via Rd 16-7-34.3 decomm	**OBJ 6** • Maintain • #2 in effects on flows and water yield due to tree removal and lower evapotranspiration, interception • Reduce existing compaction via Rd 16-7-34.3 decomm	**OBJ 6** • Maintain • #1 in effects on flows and water yield due to tree removal and lower evapotranspiration, interception • Reduce existing compaction via Rd 16-7-34.3 decomm	**OBJ 6** • Maintain • No effects on flows and water yield; no tree removal nor change in evapotranspiration, interception • No decomm Rd 16-7-34.3; no reduction existing compaction
	OBJ 7 • Maintain	**OBJ 7** • Maintain	**OBJ 7** • Maintain	**OBJ 7** • Maintain	**OBJ 7** • Maintain
	OBJ 8 • Maintain • Short-term reduction in RR canopy closure due to DM; ultimately hasten LSCs	**OBJ 8** • Maintain • Short-term reduction in RR canopy closure due to DM; ultimately hasten LSCs	**OBJ 8** Maintain • Short-term reduction in RR canopy closure due to DM; ultimately hasten LSCs	**OBJ 8** • Maintain • No short-term reduction in RR canopy closure due to DM; no hastening LSCs	**OBJ 8** • Maintain • No short-term reduction in RR canopy closure due to DM; no hastening LSCs
	OBJ 9 • Maintain • Hasten LSC in 30 acres RR • Undetected S&M lichens may be harmed due to yarding corridors; detected S&M lichens protected	**OBJ 9** • Maintain • Hasten LSC in 60 acres RR • Undetected S&M lichens may be harmed due to yarding corridors; detected S&M lichens protected	**OBJ 9** • Maintain • Hasten LSC in 60 acres RR • Undetected S&M lichens may be harmed due to yarding corridors; detected S&M lichens protected	**OBJ 9** • Maintain • No hastening of LSC in RR • Undetected S&M lichens may be harmed due to yarding corridors; detected S&M lichens protected	• **OBJ 9** • Maintain • No hastening of LSC in RR • No effect on undetected S&M lichens

	Alternative				
	1	2	3	4	5
What are the effects of roads and yarding on soil productivity?	**Slope Stability** • No effect	**Slope Stability** • No effect	**Slope Stability** • No effect	**Slope Stability** • Landslide potential higher	**Slope Stability** • No effect
	Sedimentation/ Water Quality • No direct or indirect effects	**Sedimentation/ Water Quality** • No direct or indirect effects	**Sedimentation/ Water Quality** • No direct or indirect effects	**Sedimentation/ Water Quality** • No direct or indirect effects	**Sedimentation/ Water Quality** • No direct or indirect effects
	Soil Compaction/ Site Productivity • AAE ≤ 2.8 acres • 140 acres cable • No road construction • #3 in effects • Decommission existing Road No. 16-7-34.3 • Site productivity losses <1%	**Soil Compaction/ Site Productivity** • AAE ≤ 4.0 acres • 160 acres cable • 4 acres road construction • #1 (greatest) in effects • Decommission existing Road No. 16-7-34.3 • Site productivity losses <1%	**Soil Compaction/ Site Productivity** • AAE ≤ 4.4 acres • ≈120 acres cable • No road construction • #2 in effects • Decommission existing Road No. 16-7-34.3 • Site productivity losses <1%	**Soil Compaction/ Site Productivity** • AAE ≤ 2.6 acres • ≈80 acres cable • No road construction • #4 in effects • Decommission existing Road No. 16-7-34.3 • Site productivity losses <1%	**Soil Compaction/ Site Productivity** • No AAE • No Yarding • No road construction • #5 (least) in effects • No decommission of existing Road No. 16-7-34.3 • Site productivity losses <1%
What are the costs and benefits of the different yarding methods?	• Cable $150/MBF + additional for haulback line • More volume harvested than Alt. 5	• Cable $150/MBF • Road Construction required • More volume harvested than Alts. 1, 5	• Cable $150/MBF • Helicopter $300-600/MBF • Faster yarding operation • Noisier, but shorter duration than Alts. 1, 2 • More volume harvested than Alts. 1, 2, 5	• Cable $50/MBF • Helicopter $280-570/MBF • Faster yarding operation • Noisier, but shorter duration than Alts. 1, 2 • Most volume harvested	• No yarding costs • No increase in noise • No volume harvested

6.0 CUMULATIVE EFFECTS

This analysis incorporates by reference the analysis of cumulative effects in the Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (NSO FSEIS) (Chapter 3 & 4, pp. 4-10) and the RMP EIS (Chapter 4). Those documents analyze most cumulative effects of timber harvest and other related management activities. None of the alternatives analyzed here would have cumulative effects on soils, water or air quality beyond those effects analyzed in the above documents. The following section supplements those analyses, providing site-specific information and analysis particular to the alternatives considered here.

It is likely that some stands on BLM-administered lands in the Long Tom Watershed will be treated with commercial thinnings or regeneration harvests given that the surrounding sections are GFMA and Connectivity. For Fiscal Year 2003, Rock Fish (commercial thinning, 16-7-23 – Long Tom and Lake Creek Watersheds), Dead Horse (commercial thinning, 15-6-21, 27), and Get Ready (commercial thinning, 16-7-25) will be analyzed for treatment. Past activity includes Little Al, a thinning in 17-6-7, 8, and 17, sold in 2001. Bishops Hat, a thinning in 17-7-21, was sold in 2002.

On private lands in the watershed, more intensive timber management actions, including clearcutting and broadcast burning, are occurring and are likely to continue. Also, it is possible that some forest stands on private land will be converted to non-forest land, for either agricultural or residential use. Private lands provide habitat for deer, elk, and neotropical birds but will primarily alternate between early- to mid-seral stages.

7.0 CONSULTATION AND COORDINATION

7.1 LIST OF PREPARERS

The Proposed Action and alternatives were developed and analyzed by the following interdisciplinary team of BLM specialists.

NAME	TITLE	DISCIPLINE
Karin Baitis	Soil Scientist	Soils
Mark Stephen	Forest Ecologist	Ecology
Brett Jones	Engineer	Roads/Transportation
Darryl Ashcraft	Fuels Specialist	Fuels/Air Quality
Michael Southard	Archaeologist	Cultural Resources
Peter O'Toole	Silviculturist/Timber Planner	Silviculture
Carla Alford	T & E and Wildlife Biologist	Wildlife Habitat
Rob Preece	Biological Technician	Fisheries
Douglas Goldenberg	Botanist	Botanical Resources
Janet Zentner	Forester	Logging Systems
Saundra Miles	Recreation Planner	Visual Resources and Recreation
Gary Hoppe	Landscape Planner	Planning and Environmental Coordination
Steve Steiner	Forest Hydrologist	Hydrology

7.2 CONSULTATION

This proposed action has been addressed in the FY 2003-04 Habitat Modification Biological Opinion which was issued on September 30, 2002. All required mitigation measures included in this Opinion would be followed to ensure compliance with the Endangered Species Act.

Because of the modification of dispersal habitat in an area that would continue to provide an adequate amount of this habitat after harvest, this project "May Affect, but is Not Likely to Adversely Affect" the northern spotted owl.

No suitable or potential habitat for the marbled murrelet exists within 0.25 miles of the proposed harvest area. No suitable or potential habitat for marbled murrelets exists within 0.25 mile of the project area or haul route. Although potential habitat exists within 0.5 mile of the project area, there are restrictions on heavy helicopter use. Therefore, disturbance from Alternatives 1-4 "May Affect, but is Not Likely to Adversely Affect" marbled murrelets.

There would be no effect to the bald eagle.

The Bureau of Land Management Siuslaw Resource Area consulted with the Confederated Tribes of Siletz, and the Confederated Tribes of the Grande Ronde. No response was received.

8.0 REFERENCES

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9.0 GLOSSARY

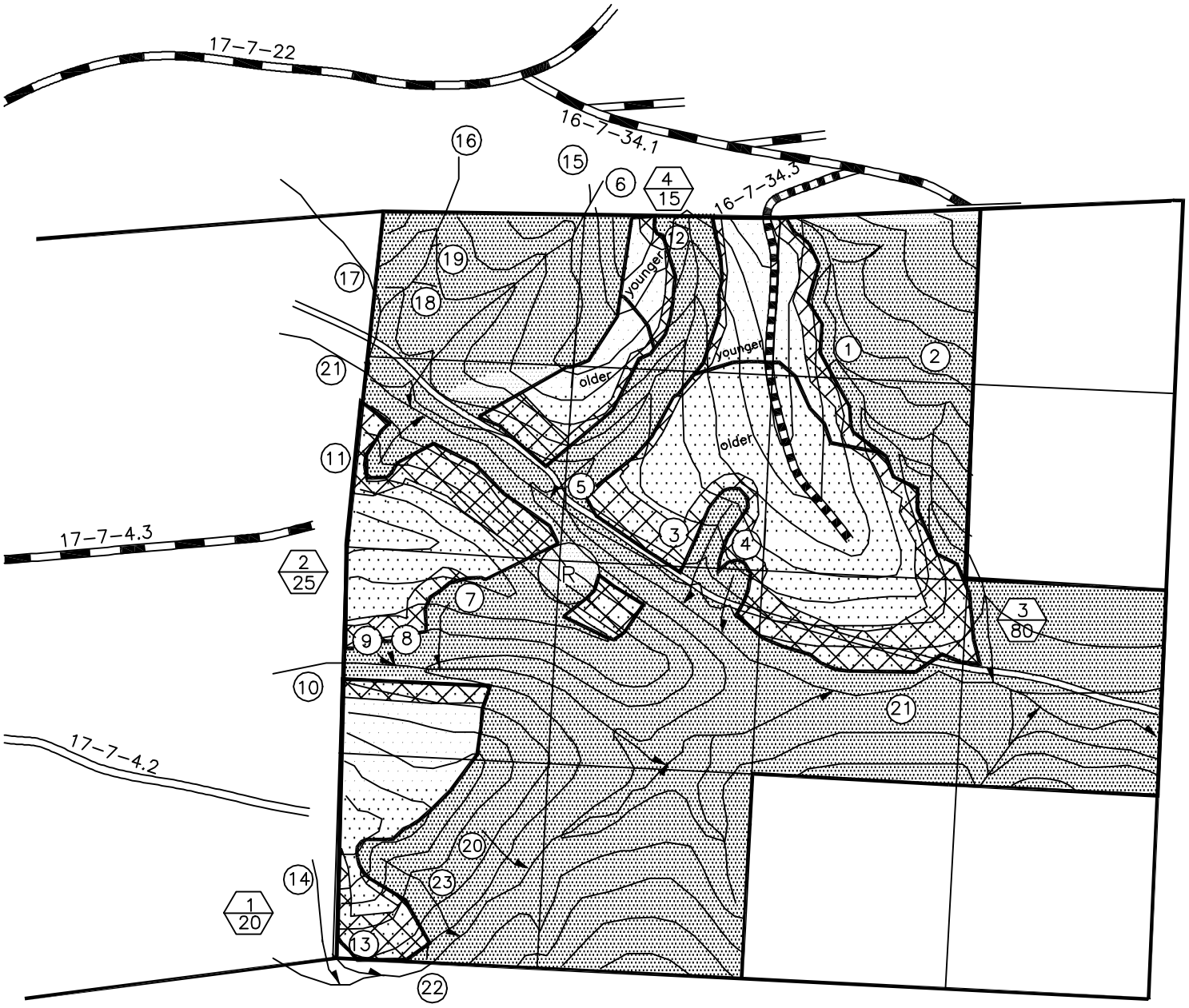
Regeneration Harvest: This silvicultural system is applied in the Matrix land use allocation. During regeneration harvest, most of the stand is cut. In the General Forest Management Area, an average of 6-8 trees per acre are reserved from cutting and left as clumps, strips, or scattered individual trees. In Connectivity, an average of 12-18 trees per acre are reserved.

Full-bench road: In full-bench construction, the entire road surface is excavated into the hill. The excavated material is pushed or hauled to an area needing fill or to a disposal area.

Cut-and-fill road construction: Cut-and-fill road construction, also known as sidecast or partial bench construction, is the most common forest road building technique. Excavated material from the uphill slope is pushed, or cast, onto the downhill slope to form a fill to support the outside portion of the running surface of the road.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

7TH PARADISE
T. 17 S., R. 7 W., SECTION 17
ALTERNATIVE 1
NO NEW ROADS

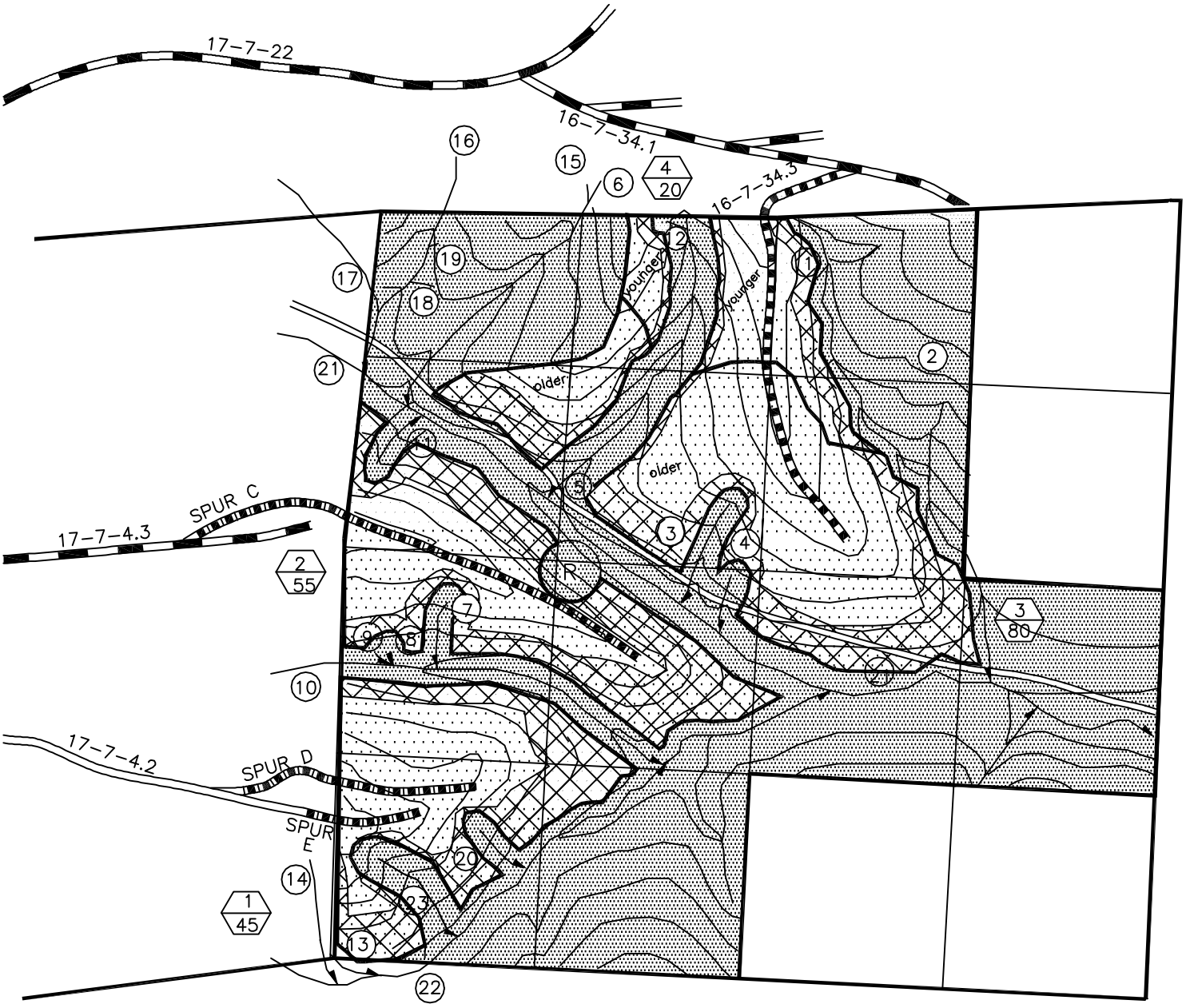


LEGEND

- DENSITY MANAGEMENT AREA
- RESERVE AREA
- RIPARIAN RESERVE TREATMENT AREA
- HARVEST UNIT NUMBER / ACREAGE WITHIN AREA
- ROCKED ROAD
- DIRT ROAD
- ROAD TO BE RENOVATED
- R — RAMALINA RESERVE
- # — HYDROLOGICAL FEATURE NUMBER
- STREAM

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

7TH PARADISE
T. 17 S., R. 7 W., SECTION 17
PROPOSED ACTION
ALTERNATIVE 2
LONG SPAN CABLE



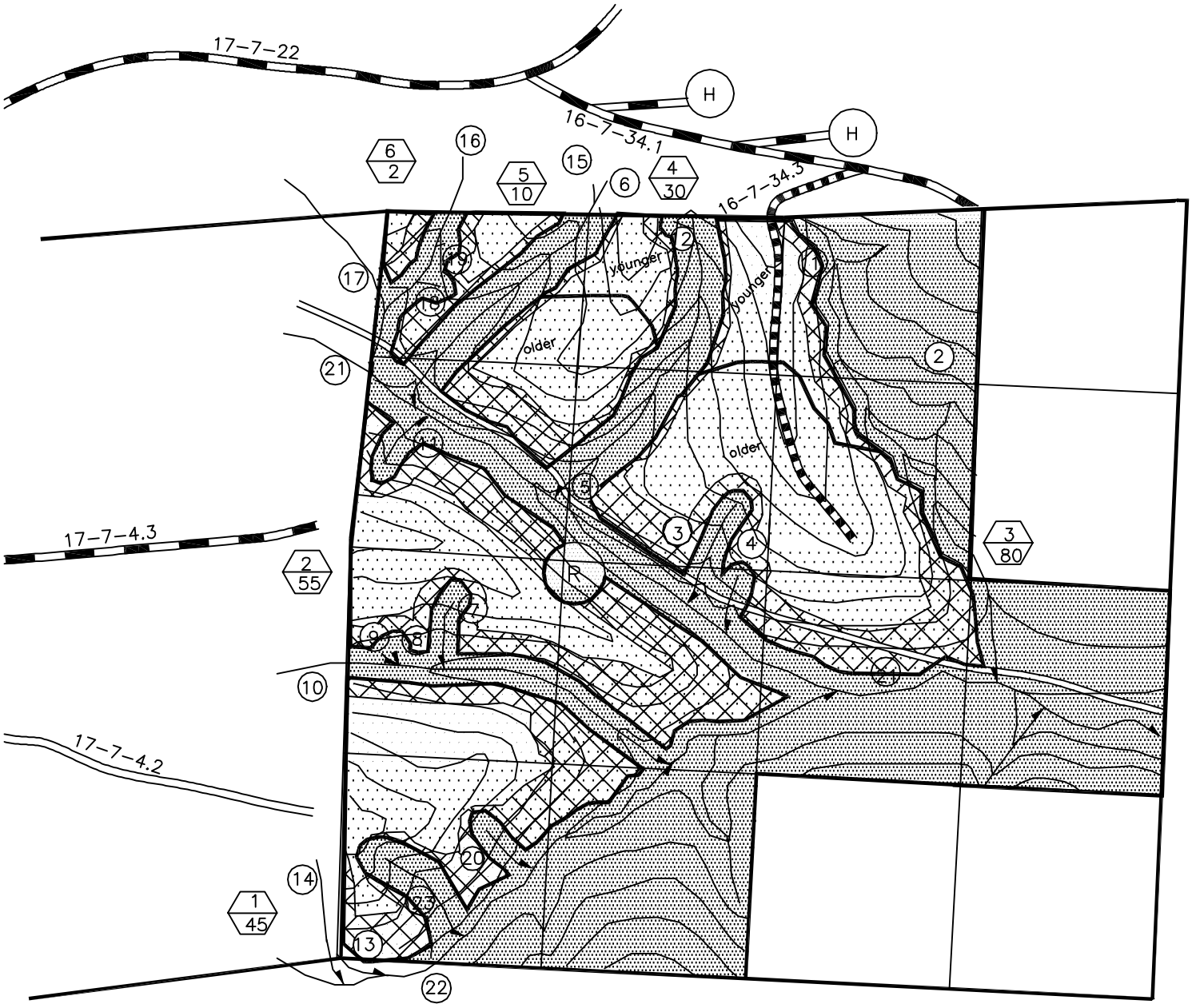
LEGEND

- DENSITY MANAGEMENT AREA
- RESERVE AREA
- RIPARIAN RESERVE TREATMENT AREA
- HARVEST UNIT NUMBER / ACREAGE WITHIN AREA
- ROCKED ROAD
- DIRT ROAD
- ROAD TO BE RENOVATED
- ROAD TO BE CONSTRUCTED
- R — RAMALINA RESERVE
- # — HYDROLOGICAL FEATURE NUMBER
- STREAM

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

7TH PARADISE
T. 17 S., R. 7 W., SECTION 17

ALTERNATIVE 3
AERIAL & CABLE



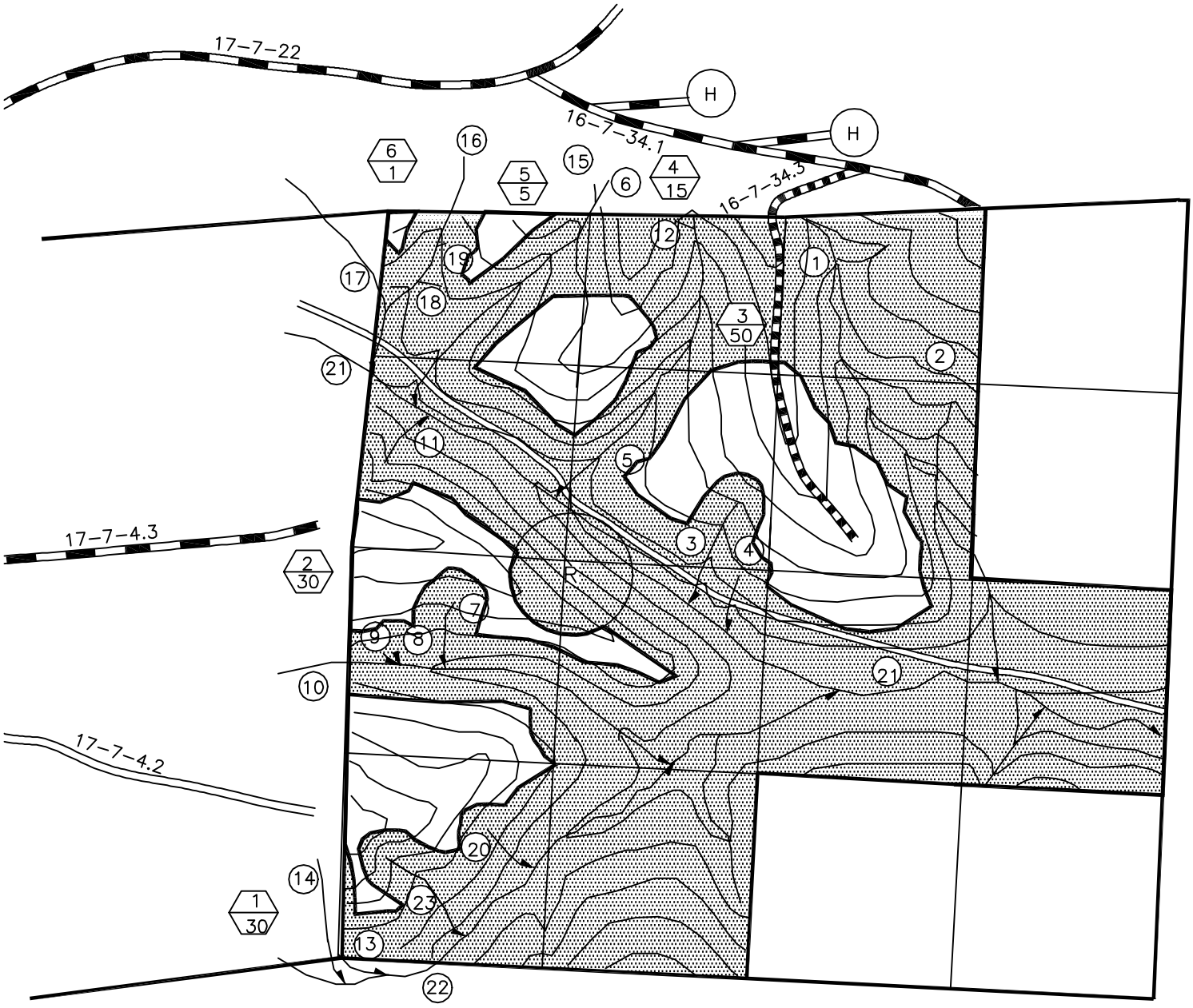
LEGEND

- DENSITY MANAGEMENT AREA
- RESERVE AREA
- RIPARIAN RESERVE TREATMENT AREA
- HARVEST UNIT NUMBER / ACREAGE WITHIN AREA
- ROCKED ROAD
- DIRT ROAD
- ROAD TO BE RENOVATED
- R — RAMALINA RESERVE
- STREAM

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

7TH PARADISE
T. 17 S., R. 7 W., SECTION 17

ALTERNATIVE 4
AERIAL & CABLE
REGENERATION HARVEST



LEGEND

DENSITY MANAGEMENT AREA

RESERVE AREA

RIPARIAN RESERVE TREATMENT AREA

HARVEST UNIT NUMBER
ACREAGE WITHIN AREA

ROCKED ROAD
DIRT ROAD
ROAD TO BE RENOVATED

R RAMALINA RESERVE

STREAM

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
EUGENE DISTRICT OFFICE
Preliminary Finding of No Significant Impact
for
7th Paradise Timber Sale
ORO90-EA-03-11

Determination:

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

Steven Calish
Field Manager, Siuslaw Resource Area

Date

Environmental Assessment

for

7th Paradise Timber Sale
ORO90-EA-03-11

July 2003

United States
Department of the Interior
Bureau of Land Management
Eugene District Office
Siuslaw Resource Area