HILLOCK ENVIRONMENTAL ASSESSMENT

Commercial Thinning/Density Management
and
OHV/Recreation Damage Restoration

Environmental Assessment Number OR080-04-04
Tract No. 04-503
May 2004

United States Department of the Interior
Bureau of Land Management, Oregon State Office
Salem District, Cascades Resource Area
Clackamas County, Oregon

Responsible Agency:	USDI - Bureau of Land Management
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Abstract: This environmental assessment discloses the predicted environmental effects of two projects on federal land located in Township 5 South, Range 4 East, Sections 12, 14, 24 and 36, Willamette Meridian; and within the Upper Clear Creek and the Upper South Fork of Clackamas River Watersheds. Project 1, the Hillock timber sale, is a proposal to thin approximately 450 acres in the Matrix (GFMA) land use allocation (LUA) and approximately 50 acres in adjacent portions of those stands in the Riparian Reserve LUA. Project 2, the Helens Lake Shore Area and Goat Mountain OHV Trail Restoration, is a proposal to repair damage caused by Off Highway Vehicle use and other recreational activities in the same general area.

FINDING OF NO SIGNIFICANT IMPACT

Introduction

The Bureau of Land Management (BLM) has conducted an environmental analysis (Environmental Assessment Number OR080-04-04) for proposals to do two projects located on BLM lands within Township 5 South, Range 4 East, Sections 12, 14, 24, and 36, Willamette Meridian:

- Project 1: The Hillock Timber Sale, commercial thinning in 45-55 year old conifer plantations on 450 acres of Matrix and 50 acres of adjacent Riparian Reserve.

- Project 2: Helens Lake Shore Area and Goat Mountain OHV Trail Restoration
  - Helens Lake, two alternatives (with or without limited camping and parking) to clean up, reduce hazards, control erosion, revegetate and place boulders to restore a damaged portion of the shore area and prevent future damage.
  - Goat Mtn., one action alternative to repair and prevent erosion, revegetate and block unauthorized OHV trails.

The Hillock Environmental Assessment (EA) documents the environmental analysis of the above projects. The EA is attached to and incorporated by reference in this Finding of No Significant Impact (FONSI) determination. The following documents direct and provide the legal framework for management of BLM lands within the Salem District: *Salem District Record of Decision and Resource Management Plan*, May 1995 (RMP); *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl and Standards and Guidelines for Management of Habitat for Late-Successional and Old Growth Forest Related Species Within the Range of the Northern Spotted Owl*, April 1994 (NWFP); *Record of Decision to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines in Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl*, March 2004. All action alternatives of both proposed projects are designed to comply with the management goals, objectives, and direction (e.g. standards and guidelines) of the above documents.

The EA and FONSI will be made available for public review May 19, 2004 to June 18, 2004. The notice for public comment will be published in a legal notice by the Clackamas County News newspaper; and posted on the Internet at http://www.or.blm.gov/salem/html/planning/index.htm under Environmental Assessments. Comments received by the Cascades Resource Area of the Salem District Office, 1717 Fabry Road SE, Salem, Oregon 97306, on or before June 18, 2004 will be considered in making the final decisions for this project.

Finding of No Significant Impact

Based upon review of the EA and supporting documents, I have determined that the Proposed Actions for both Project 1, the Hillock Timber Sale, and Project 2, Helens Lake Shore Area and Goat Mountain OHV Trail Restoration, are not major federal actions and would not significantly affect the quality of the human environment, individually or cumulatively with other actions in the general area. No environmental effects meet the definition of significance in context or intensity as defined in 40 CFR 1508.27. Therefore, an environmental impact statement is not

needed. This finding is based on the following discussion and unless otherwise specified, the following apply to both projects:

Context: Potential effects resulting from the implementation of the proposed action have been analyzed within the context of the South Fork Clackamas River Watershed, the Clear Creek/Foster Creek Watershed, and the project area boundaries. The proposed action would occur on approximately 450 acres of BLM General Forest Management Area land and 50 acres of Riparian Reserve, encompassing less than 2 % of these Watersheds [40 CFR 1508.27(a)].

Intensity

1. Projects 1 and 2 are unlikely to a have any significant adverse impacts on the affected elements of the environment [40 CFR 1508.27(b)(1)]. The affected elements for project 1 are vegetation and forest stand characteristics, soil and site productivity, water and hydrology, wildlife, fisheries and aquatic habitat, visual resources, recreation, rural/urban interface, and fire management/air quality - EA section 2.3, 2.4). The affected elements for project 2 are: vegetation, soil, water, fish habitat, fire, recreation, ACECS, hazardous/solid wastes, riparian, land uses (permits and rights-of-way), and visual resources. (EA section 3.3).

   For both projects, any potential negative effects to these resources are anticipated to be site-specific and/or not measurable (i.e. undetectable over the watershed, downstream, and/or outside of the project area) for the following reasons.

   - Project 1: The following is a summary of the design features that would reduce the risk of adverse effects to the above resources (EA sections 2.2.2.2, 2.4).
     - retaining as much coarse woody debris and as many snags as are feasible, for wildlife habitat;
     - restricting operating conditions (e.g. dry weather and soil conditions, limiting the extent of the area impacted, maximum slope) for ground-based yarding, road work operations, and hauling to avoid runoff and sedimentation;
     - restricting the use of ground based logging equipment to locations where skyline yarding is not practical (no more than ten percent of the proposed harvest area) and allowing multiple pass operations only on existing skid trails to minimize potential impacts to the productive capacity of the soil;
     - using skyline yarding in the remainder of the proposed harvest area to minimize potential impacts to the productive capacity of the soil;
     - establishing no entry buffers adjacent to all project area streams to maintain canopy cover, water quality, and channel morphology;
     - decommissioning, stabilizing, blocking or gating many roads in the project area after the completion of timber harvest operations to control motor vehicle access and prevent erosion and sedimentation;
     - using a mixture of native species seed to reduce potential for noxious weeds to become established and to allow the species most adapted to the site to dominate the mix; and
     - controlling motor vehicle access and utilizing fuel reduction treatments to reduce fire danger.

- Project 2: The following is a summary of the design features that would reduce the risk of adverse effects to the above resources (EA sections 3.2.2.2, 3.4).
  - restricting operating conditions for soil disturbing operations to avoid causing runoff and sedimentation;
  - using a mixture of native species seed and cuttings/transplants from the margins of the treatment areas to reduce potential for noxious weeds to become established and would allow the species most adapted to the site to dominate the mix; and
  - controlling public access and camping to reduce fire danger.

2. Projects 1 and 2 would not affect:
   - Public health or safety [40 CFR 1508.27(b)(2)] (EA sections 2.2.2.2, 2.3, 3.1, 3.2, 3.3);
   - Unique characteristics of the geographic area [40 CFR 1508.27(b)(3)] - There are no historic or cultural resources, parklands, prime farmlands, wild and scenic rivers, wilderness, or ecologically critical areas located within the project area (EA sections 2.3, 3.3);
   - Districts, sites, highways, structures, or other objects listed in or eligible for listing in the National Register of Historic Places, nor would the proposed action cause loss or destruction of significant scientific, cultural, or historical resources [40 CFR 1508.27(b)(8)] (EA sections 2.3, 3.3).

3. Projects 1 and 2 are not unique or unusual. The BLM has experience implementing similar actions in similar areas without highly controversial [40 CFR 1508.27(b)(4)], highly uncertain, or unique or unknown risks [40 CFR 1508.27(b)(5)].

4. Projects 1 and 2 do not set a precedent for future actions that may have significant effects, nor does it represent a decision in principle about a future consideration [40 CFR 1508.27(b)(6)].

5. The interdisciplinary team evaluated Projects 1 and 2 in context of past, present and reasonably foreseeable actions [40 CFR 1508.27(b)(7)]. Potential cumulative effects are described in the attached EA (EA sections 2.3, 2.4, 3.3). These effects are not likely to be significant because of the project's scope (effects are likely to be too small to be measurable), scale (project area of 500 acres, less than 2 % of the total 5th-field watersheds), and duration (direct effects would occur over 2-20 years in project 1 and 3-5 years in project 2- EA section 2.4, 3.4).

6. Projects 1 and 2 are not expected to adversely affect Endangered or Threatened Species or habitat under the Endangered Species Act (ESA) of 1973 [40 CFR 1508.27(b)(9)].

   Wildlife: There is no northern spotted owl Critical Habitat in or near the project area. Consultation with the USFWS resulted in a "May Affect, Not Likely to Adversely Affect" Determination for northern spotted owl. In the short term, up to 500 acres of dispersal habitat for the northern spotted owl would be degraded, but would remain dispersal habitat. The Hillock proposal was submitted for Formal Consultation with U.S. Fish and Wildlife Service on September 3, 2002. The resulting **Biological Opinion dated February 27, 2003 (FWS reference: 1-7-03-F-0008)** concurred with the above finding. All applicable terms and conditions from the Biological Opinion would be incorporated into the project design features.

Fish: Lower Columbia River steelhead trout, Lower Columbia River Chinook salmon, and Upper Willamette River Chinook salmon, all of which may be found in Clear Creek and the short anadromous reach of the South Fork Clackamas River are listed as 'threatened' under the Endangered Species Act of 1973. Lower Columbia River/Southwest Washington coho salmon are listed as 'threatened' under the State of Oregon Endangered Species Act. A determination has been made that the proposed project would have "No Effect" on ESA listed fish (see EA section 2.4.5 and EA Appendix 1, *Endangered Species Act Determination of Effect for Lower Columbia River steelhead trout, Lower Columbia River chinook salmon and Upper Willamette River chinook salmon*). As a result of the "No Effect" determination, no consultation with NOAA Fisheries for ESA listed fish species is required.

7. Projects 1 and 2 do not violate any known Federal, State, or local law or requirement imposed for the protection of the environment [40 CFR 1508.27(b)(10)] (EA section 1.3).

Prepared by: M Keith Walton — 17 May 2004
Keith Walton, Team Lead — Date

Reviewed by: Carolyn Sands — 5/18/2004
Carolyn Sands, NEPA — Date

Approved by: Cindy Enstrom — 5/19/2004
Cindy Enstrom, Field Manager — Date
Cascades Resource Area

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1.0 INTRODUCTION

1.1 Projects Covered in This EA

Two Projects will be analyzed in this EA. Project 1, the Hillock timber sale, is a proposal to thin approximately 450 acres in the General Forest Management Area (GFMA) portion of the Matrix land use allocation (LUA) and approximately 50 acres in adjacent portions of those stands in the Riparian Reserve LUA. Project 2, the Helens Lake Shore Area and Goat Mountain OHV Trail Restoration, is a proposal to repair damage caused by dispersed camping, off highway vehicle use and other recreational activities in the same general area.

1.1.1 Relationship between Projects

The two projects are not related to each other. They were evaluated by the same IDT and analyzed in the same EA for efficiency since they are in the same geographic area.

1.2 Project Area Location

The Hillock Projects are located on BLM managed lands in Sections 12, 14, 24 and 36, Township 5 South, Range 4 East, Willamette Meridian. The project area is approximately ten air miles south-southeast of Estacada, Clackamas County, Oregon, on the Hillockburn Road. Some of the OHV trail restoration projects may extend into other sections, and/or other ownerships adjacent to their current locations by the time the restoration project could be implemented.

1.3 Land Use Plans, Policies, and Programs Directing the Proposed Projects

The following documents direct and provide the legal framework for management of BLM lands within the Salem District: **1/** *Salem District Record of Decision and Resource Management Plan*, May 1995 (RMP)[1] This EA incorporates the analysis contained in the *Salem District Proposed Resource Management Plan/Final Environmental Impact Statement*, September 1994 (RMP/FEIS). The discussion in this EA is site-specific and supplements analysis found in RMP/FEIS; **2/** *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl and Standards and Guidelines for Management of Habitat for Late-Successional and Old Growth Forest Related Species Within the Range of the Northern Spotted Owl*, April 1994 (NWFP); **3/** Watershed Analyses (The *South Fork Clackamas River Watershed Analysis* was completed in February 1997, pp. 1-14, 1-15 and 1-19. The primary objective of the GFMA is to manage for timber production while providing for other resources, with an emphasis on the use of intensive forest management practices. In Riparian Reserves, the goal is to achieve and maintain habitat conditions, high quality water, and habitat connection for late-successional species and habitat for other terrestrial species. The *Clear Creek/Foster Creek Watershed Analysis* was completed in November 2002 and has similar objectives rooted in the NWFP and RMP); ; **4/** *Record of Decision to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines in Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl,* March 2004.

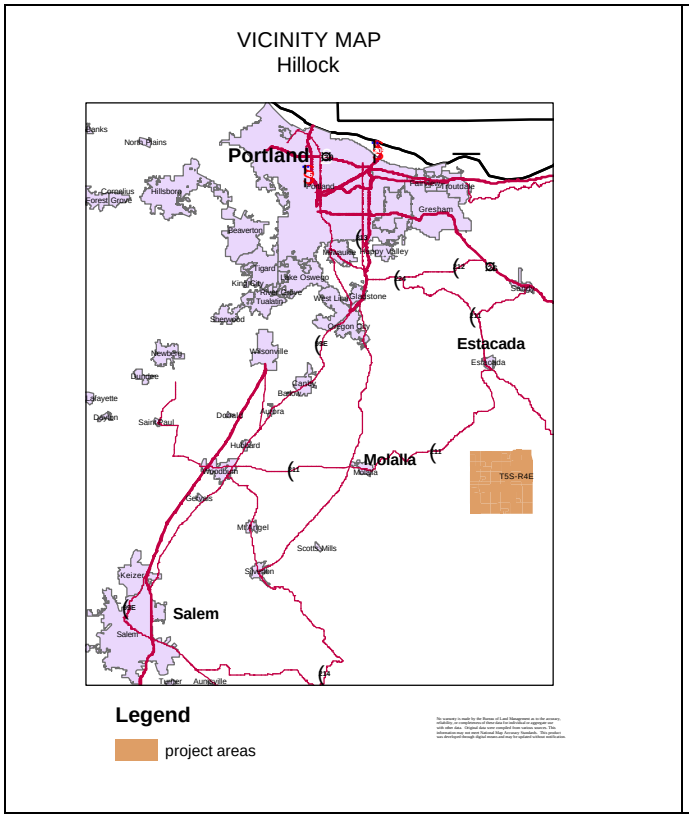
[1] Individual RMP references can be found in the applicable section of this document.

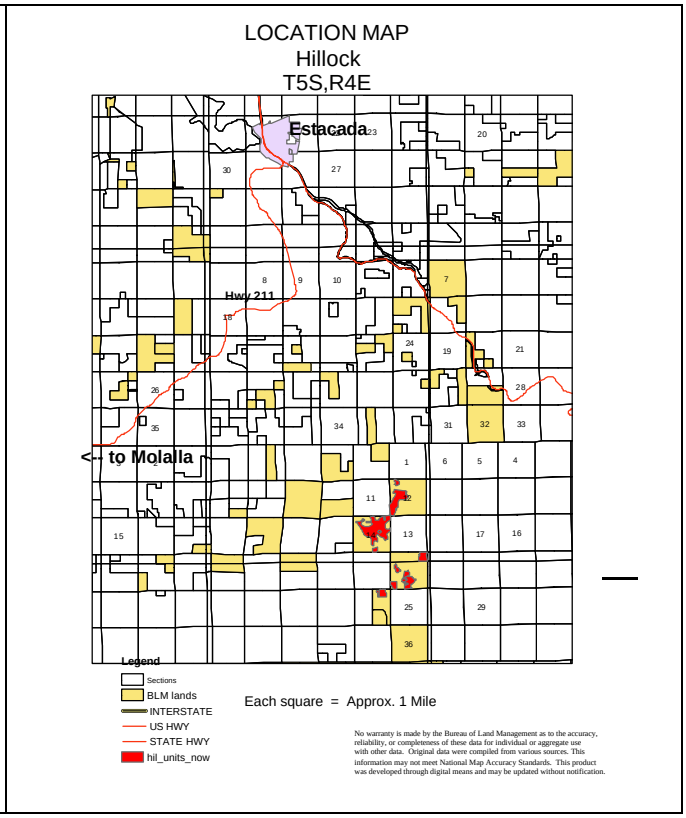
All action alternatives of both proposed projects are designed to comply with the management goals, objectives, and direction (e.g. standards and guidelines) of the above documents. These documents are available for review in the Salem District Office. Additional information about the proposed Hillock projects is available in the Hillock Projects NEPA/EA Analysis File, also available at the Salem District Office.

1.4 Decision to be Made

The Cascades Resource Area Field Manager is the official responsible for deciding whether or not to prepare an environmental impact statement, and whether to approve projects 1 and 2 as proposed, not at all, or to some other extent.

Maps 1 and 2: Vicinity Map and Location Map





2.0 PROJECT 1 – HILLOCK TIMBER SALE

2.1 Purpose of and Need for Action

Stands within the project area average 45-55 years old and an analysis of resource data (e.g. stand exams) has identified that these stands are ready for treatment. For this project, the Interdisciplinary Team has limited the project area to stands that are in need of thinning. In addition, the following describe the purpose of and the need for action:

- To manage developing timber stands in Matrix LUA so that:
  - A marketable timber sale can be offered that will contribute to a sustainable supply of timber for local, regional, and national economies and contribute to community stability (RMP pg. 20), as reflected in the Salem District allowable sale quantity (ASQ) (RMP, pp. 1, 46, 47).
  - A desirable balance can be achieved between wood volume production, quality of wood, and timber value at harvest;
  - A healthy forest ecosystem can be maintained with habitat to support plant and animal populations and protect riparian areas and water resources (RMP p. 1);

- To manage early to mid-seral stands in Riparian Reserve LUAs so that:
  - Growth of trees can be accelerated to restore large conifers to Riparian Reserves (RMP p. 7);
  - Habitat for populations of native riparian-dependent plants, invertebrates, and vertebrate species can be enhanced or restored (RMP p. 7);
  - Structural and spatial stand diversity can be provided on the landscape level in the long term.

- To maintain and develop a safe, efficient and environmentally sound road system (RMP p. 62) that:
  - Provides appropriate access for timber harvest and silvicultural practices used to meet the objectives above;
  - Reduces potential human sources of wildfire ignition and provides for fire vehicle and other management access.
  - Reduces environmental effects associated with identified existing roads within the project area.

2.2 Alternatives

2.2.1 Alternative Development

Pursuant to Section 102 (2) (E) of NEPA (National Environmental Policy Act of 1969, as amended), Federal agencies shall "…study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." No unresolved conflicts concerning alternative uses of available resources (section 102(2) (E) of NEPA) were identified. No alternatives were identified that would meet the purpose and need of the project and have meaningful differences in environmental effects from the proposed action. Therefore, this EA will analyze the effects of the "proposed action" and the "no action alternative".

2.2.2 Proposed Action

The BLM proposes to commercially thin up to 500 acres of 45-55 year old managed conifer stands: 450 acres in GFMA (General Forest Management Area, Matrix Land Use Allocation) and 50 acres in Riparian Reserve.

Table 1: Proposed Harvest Units Summary

Section	Units	GFMA Acres	RR Acres	Total Acres	Trees/Acre Before Treatment	Trees/Acre After Treatment
12	12A, 12 B	109	8	117	299	157-194
14	14A, 14B	233	14	247	284	91-127
24	24A, 24B, 24C, 24D, 24E	92	31	123	Low – 243 High - 297	Low – 112-174 High – 203-224
Mapped Total Acres*		434	53	487		
Analyzed Acres*		450	50	500		

* Acres rounded to 450/50/500 for analysis and to reflect acres used for consultation.

Timber harvest would be done with a skyline yarding system on approximately 90 percent of the harvested area and a ground based logging system on the remaining 10 percent of the area. Ground based logging would be done only in locations that are not suited to skyline yarding and where the condition and locations of existing skid trails provide equipment access with minimal potential for impacts to the productive capacity of the soil

While the purposes for thinning in Riparian Reserves and on Matrix land are different, at this stage in stand development the same silvicultural and operational methods would achieve those purposes. The Matrix thinning provides the opportunity to treat the adjacent Riparian Reserves to achieve the desired results described in EA section 2.1.

Photos 1 and 3 on the next page are typical of the crowded BLM forest stands proposed for thinning. Photos 2 and 4 show a nearby US Forest Service stand that has been thinned to very similar standards as are proposed for the BLM thinning.

Photo 1: Before Treatment

Photo 2: After Treatment

Photo 3: Before Treatment

Photo 4: After Treatment

2.2.2.1 Connected Actions

1. **Road Work:**
   - One spur road would be constructed and one extended, a total length of 0.3 mile or less of new construction, to reach landing sites required for skyline yarding. These roads would be decommissioned and blocked after use.
   - Approximately 0.4 mile of previously decommissioned road would be renovated for use under this proposal and decommissioned again after timber harvest operations are completed.
   - Approximately 7.8 miles of existing roads would be renovated (e.g. graded, shaped, upgrade culverts) for use under this project, then stabilized, and/or blocked after use.
   - Up to 11.7 miles of paved (asphalt) road would be renovated by brushing, and cleaning of ditches and culverts as needed.
   - Up to 1.0 mile of unmaintained rock and natural surface road from the previous logging would be reconstructed, then decommissioned and blocked after harvest operations.

2. **Fuels Treatments:**
   - Adjacent to roads that are open to motor vehicle travel by the public, logging slash and debris would be hand piled, covered and burned.
   - Landing and miscellaneous logging debris piles would be covered and burned.

3. **Blocking Potential OHV Trails:**
   - Skid trails and other potential access points that could result in unauthorized OHV trails would be blocked and made impassible.

4. **Special Forest Products (SFP):**
   - Special Forest Products from the harvest units would be offered for harvest if market demand, product availability, and contract timing allow such offerings.

2.2.2.2 Project Design Features

All logging activities would utilize the Best Management Practices (BMP) required by the Federal Clean Water Act (as amended by the Water Quality Act of 1987) to reduce non-point source pollution to the maximum extent practicable.

1. **Timber Harvest – General**

   Operational Periods
   - The timber sale would be scheduled to allow operations for two or three operating seasons.
   - In general, timber harvest operations start in mid July and continue until fall/winter weather conditions end the operating season. Operations are restricted for:
     - The spring growing season when bark is easily damaged (typically April 01-June 30). No falling or yarding operations which could damage residual trees would be allowed. (Silvicultural Prescriptions)
     - Wet conditions: Tractor operations (i.e. ground based logging/skidding, road construction, road decommissioning), and haul would not be allowed when soil

moisture is high (generally November through May) and these operations would cause compaction and potentially increase erosion and sedimentation (BMP).

Table 2: Typical seasonal restrictions calendar

Restricted Ops.	Reason	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Falling and yarding	Bark slippage												
Tractor ops. and hauling	Soil damage												

Key	Operations generally allowed.	Operations typically dependent on conditions.	Operations generally not allowed.

2. Vegetation and Forest Stand Characteristics/Habitat Management

- Marking and retention guidelines would be implemented in each stand as follows:
  - Generally, smaller trees would be selected for cutting; larger trees at the prescribed spacing would be retained for the residual stand.
  - A mix of species reflecting the pre-treatment composition of dominant and co-dominant trees in the stands would be retained.
  - Some cull and deformed trees would be retained for future structural complexity.
  - Residual densities would be variable over the landscape and within stands. The range of variability would be higher in Riparian Reserves.
  - Average canopy closure would not be reduced below 40% in a stand (Wildlife Report, p. 6).
- Unmerchantable snags of all sizes and decay classes would be left standing to the greatest extent possible under standard contractual logging procedures, BMP, and OSHA requirements. Any such snag cut or knocked down, would remain on site.
- Coarse woody debris (CWD) already on the ground would be retained and protected to the greatest extent possible from disturbance during treatment.
- Ground disturbing equipment would be cleaned as needed to be free of off-site soil, plant parts and seed prior to entering the project area.

3. Roads, Landings, and Hauling

Table 3: Road Summary

Item Number **– Action:** **Type of treatment and typical operations, (current surface)**	**Road Number and Segments**	**Mapped Length (Miles)**
Item 1 **-- Renovation:** Roadside brushing, ditch & culvert cleaning (USFS asphalt)	4-4E-24.00	**10.9**
Item 2 **-- Renovation:** Brush, blade, ditch & culvert clean as needed (rock surface)	5-4E-12.00, A,B,C; 12.01, C part: 12.03, A; 12.04, A part; 12.06; 14.02; 14.12; 24.00, A part; 24.03; 25.01, B part, C part	**4.7**

Item Number – **Action:** **Type of treatment and typical operations, (current surface)**	**Road Number and Segments**	**Mapped Length (Miles)**
Item 3 **-- Renovation:** Brush, rip to remove larger rocks, blade, compact, pit run rock, ditch & culvert clean as needed (rock surface)	5-4E-12.01, C part; 12.02; 14.00, A; 23.00 B part	**1.4**
Item 4 **-- Renovation:** Brush, spot rock (pit run), blade, ditch and culvert clean as needed (rock surface)	5-4E-12.01, A,B,C part; 14.03 part; 23.00, A,B part	**1.7**
Item 5 **-- Renovation:** Previously decommissioned roads to brush, blade, ditch clean as needed, decommission again after use (rock surface, ripped)	5-4E-14.00, part; 14.03, B part; 14-06	**0.4**
Item 6 **-- Renovation:** Brush, ditch and culvert clean as needed (BLM asphalt)	5-4E-25.01, A,B part	**0.8**
Item 7 **-- Reconstruction:** Brush, blade with dozer, align entrance and some curves for negotiation by modern trucks, pit run rock as needed, ditch as needed, decommission after use (unmaintained, combination of rocked and natural surface)	5-4E-12.03, B; 14.07; 14.05; 14.08;	(estimated) **1.0**
Item 8 – New Construction: Natural surface, decommission after use	Extension of 5-4E-12.03 B, spur off of 5-4E-25.01	(estimated) **0.3**

- No new stream crossings would be constructed.
- Roads to be renovated in Items 3 and 4 would be maintained in a drivable and stable condition after harvest operations.
- The road through section 14 (parts of Items 3 & 4) would be gated at all unblocked access points to prevent unauthorized motor vehicle use while allowing for authorized management and emergency vehicle use.
- All roads to be constructed (Item 8), reconstructed (Item 7), and previously decommissioned roads to be renovated (Item 5) would be stabilized after use. Stabilization would include shaping the road surface for proper drainage to stable slopes, seeding the road with native species, and blocking the road to prevent use by OHVs.
- Sediment traps, vegetation in ditches, filters, and/or suspending hauling on gravel roads during rainstorms would be used as necessary to prevent road-related sediment from entering streams.

4. Layout, Skidding and Yarding

- Ground based logging (skidder, harvester/forwarder, shovel, etc.) would only be allowed where all multiple pass trails (skid trails) would follow existing skid trails (from logging in the 1940s and 50s). No more than 50 acres (10 percent of the proposed harvest area) would be logged with ground based systems. All BMP would be followed (RMP, C-2).
- Equipment with lateral yarding capabilities would be used for Skyline yarding.
- Landing and skyline corridor locations would be designed to avoid destruction of any large diameter snags found in the project area.
- Skid trails would be partially covered with logging slash and debris after logging is complete.

- Designated genetically superior seed trees would be protected from damage.

5. Treatment in Riparian Reserves

- Riparian Reserves to be treated would be thinned to the same prescription as the adjacent GFMA portion of each unit.
- Riparian Reserve areas to be treated would all be logged with skyline yarding systems in conjunction with the adjacent GFMA portion of each unit.
- A "No Treatment" buffer would be established on all streams to avoid direct impacts to biotic riparian zones. These buffers would be established on topographic or ecological breaks with a minimum distance of 50 feet from the edge of the channel.
- Cables and other equipment may be attached to trees within the Riparian Reserves. Reserve trees in the Riparian Reserve, outside of the No Treatment buffer, that must be felled for safe operations would be left on site as CWD. No trees would be felled inside the No Treatment buffer.

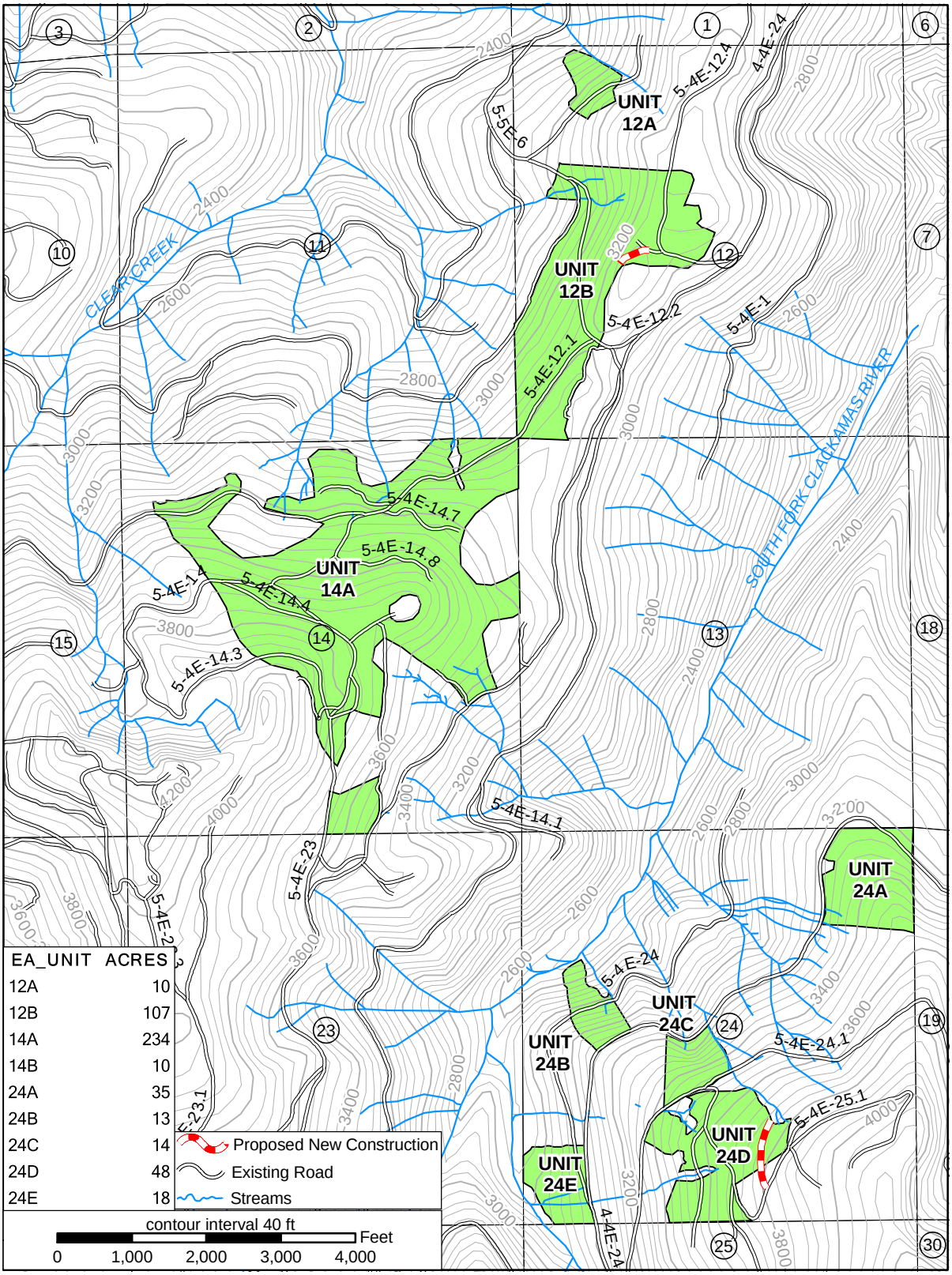
6. Fuel Treatment

- After completion of yarding, activity fuels (typically those less than three inches diameter) within 100 feet of all roads open for public motor vehicle travel would be hand piled, covered with plastic sheeting, and then burned after the fall rains begin and the soil is wet.
- Pile burning would be done under weather conditions that would be expected to keep smoke away from populated areas.

Hillock Timber Sale

Tract # OR080-04-503
EA # OR080-04-04

T5S, R4E, W.M.



United States Department of the Interior
Bureau of Land Management
Salem District Office
Cascades Resource Area
1717 Fabry Road SE
Salem, Oregon 97306

5/13/2004

2.2.3 No Action Alternative

The Hillock Timber Sale would not be offered for sale and none of the design features of the sale would be implemented. Management activities and other uses (e.g. road use, harvest of special forest products on public land) would continue on USFS, BLM, and non-federal lands within and adjacent to the project area according to plans for those areas. This alternative also serves to set the environmental baseline for comparing effects to the proposed action.

2.3 Identification of Affected Elements of the Environment

The interdisciplinary team reviewed the elements of the human environment, required by law, regulation, Executive Order and policy, to determine if they would be affected by the proposed action. Table 4 summarizes the results of that review. Critical Elements of the Environment (BLM H-1790-1, Appendix 5) are in *italics*. Affected elements are **bold**. All entries apply to the proposed action, unless otherwise noted.

Table 4: Affected Elements of the Environment for Project 1

PROJECT 1 – HILLOCK TIMBER SALE			
Elements Of The Environment	**Status: (i.e., Not Present , Not Affected, or Affected)**	**Does this project contribute to cumulative effects? Yes / No**	**Remarks If not affected, why?**
Adverse Impacts on the National Energy Policy	*Not Present*	*No*	*There are no known energy resources located in the project area. The proposed action will have no effect on energy development, production, supply and/or distribution.*
Air Quality	***Affected***	***No***	***Addressed in text (EA section 2.4.7.1)***
Areas of Critical Environmental Concern	*Not Present*	*No*	
Cultural Resources	*Not Affected*	*No*	*No cultural resources are known or suspected to be present in the proposed project area.*
Environmental Justice (Executive Order 12898)	*Not Affected*	*No*	*The proposed action is not anticipated to have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.*
Prime or Unique Farm Lands	*Not Present*	*No*	
Flood Plains	*Not Affected*	*No*	*The proposed action does not involve occupancy and modification of floodplains, and will not increase the risk of flood loss.*
Hazardous or Solid Wastes	*Not Present*	*No*	*No hazardous or solid wastes are known to be on the proposed project area or expected to be generated by the proposed project.*
Invasive, Nonnative Species (plants) (Executive Order 13112)	***Affected***	***No***	***Addressed in text (EA section 2.4.1.1)***
Native American Religious Concerns	*Not Affected*	*No*	*No Native American religious concerns were identified during the public scoping period.*

PROJECT 1 – HILLOCK TIMBER SALE			
Elements Of The Environment	**Status: (i.e., Not Present , Not Affected, or Affected)**	**Does this project contribute to cumulative effects? Yes / No**	**Remarks If not affected, why?**
Threatened or Endangered (T/E) Fish Species or Habitat	*Species - Not Affected* ***Habitat - Affected***	*No*	*Addressed in text (EA section 2.4.5.1)*
Threatened or Endangered (T/E) Plant Species or Habitat	*Not Present*	*No*	
Threatened or Endangered (T/E) Wildlife Species or Habitat	***Affected***	***No***	***Addressed in text (EA section 2.4.4.1)***
Water Quality (Surface and Ground)	***Affected***	***No***	***Addressed in text (EA section 2.4.3.1)***
Wetlands/Riparian Zones	***Affected***	***No***	***Addressed in text (EA section 2.4.3.1)***
Wild and Scenic Rivers	*Not Present*	*No*	
Wilderness	*Not Present*	*No*	
Coastal zone	Not Present	No	
Fire Hazard/Risk	**Affected**	**No**	**Addressed in text (EA section 2.4.7.1**
other Fish Species with Bureau Status and Essential Fish Habitat	Not Present/Not Affected	No	No non-T/E fish species are present in or near the project area. The project would have no effect on Essential Fish Habitat as designated under the Magnuson-Stevens Act for reasons addressed in text for T/E fish species (section 2.4.5.1).
Land Uses (right-of-ways, permits, etc)	Not Affected	No	Agreements are in place and would not be changed by the proposed project.
Late Successional and Old Growth Habitat	Not Present	No	The proposed action would have no direct or immediate effect on late successional habitat, but is intended to promote accelerated growth of retained trees and to develop an understory of brush and conifers. These all lead to a larger, more diverse stand sooner than would be developed without treatment. It is anticipated that federal government managed lands would provide the only late successional stands in the area (USFS LSR and BLM Riparian Reserves and existing old growth stands).
Mineral Resources	Not Present	No	
Recreation	**Affected**	**No**	**Addressed in text (EA section 2.4.6.1)**
Rural Interface Areas	Not Present	No	
Soils (productivity, erodibility, mass wasting, etc.)	**Affected**	**No**	**Addressed in text (EA section 2.4.2.1)**
Special Areas outside ACECs (Within or Adjacent) (RMP pp. 33-35)	Not Present	No	
other Special Status Plant Species/Habitat	**Affected**	**No**	**The timber sale implementation would be modified as needed to implement the *Bridgeoporus* management plan. Addressed in text (EA section 2.4.1.1)**
other Special Status Wildlife Species/Habitat	Not Affected	No	Key habitat features maintained. No known sites of these species.
Visual Resources	**Affected**	**No**	**Addressed in text (EA section 2.4.6)**

PROJECT 1 – HILLOCK TIMBER SALE			
Elements Of The Environment	**Status: (i.e., Not Present , Not Affected, or Affected)**	**Does this project contribute to cumulative effects? Yes / No**	**Remarks If not affected, why?**
Water Resources – Other (303d listed streams, DEQ 319 assessment, Downstream Beneficial Uses; water quantity, Key watershed, Municipal and Domestic Water Use)	Not Affected	No	Addressed in text (EA section 2.4.3.1)
Wildlife Structural Components –Other (Snags/CWD/Special Habitats)	**Affected**	**No**	**Addressed in text (EA section 2.4.4.1)**

2.4 Affected Environment and Environmental Effects

Those elements of the human environment that were determined to be affected are: vegetation and forest stand characteristics, soil and site productivity, water and hydrology, wildlife, fisheries and aquatic habitat, visual resources, recreation, rural/urban interface, and air quality/fire management (EA section 2.3). This section describes the current condition and trend of those affected elements, and the environmental effects of the alternatives on those elements.

2.4.1 Resource: Vegetation and Forest Stand Characteristics

From:

Hillock Silvicultural Prescription
Hillock Biological Evaluation for Special Status Plant Species/Survey & Manage Species and Noxious Weeds (the Botany Report) with attached *Hillock Botany Species List*
Hillock Riparian Reserves Report, pp. 1-5
Hillock Wildlife Report, pp. 1-9

Affected Environment

The following descriptions are based on Stand Exam plot data as analyzed in the *Silvicultural Prescription* and survey results reported in the *Botany Report.*

All native forest stands in the proposed project were clearcut in the 1940s and 50s, followed by broadcast burning. The current stands were naturally seeded by the remnant trees within and adjacent to this stand. The US Forest Service (USFS) and private landowners are actively managing similar stands, with similar commercial thinning projects being the most common treatment in the area, some of which would potentially be concurrent with parts of project 1. Private industrial forest land is expected to be regeneration harvested on a shorter rotation than GFMA lands, but, based on stand ages, regeneration of nearby stands are not expected to overlap this project.

Pre-commercial thinning (PCT) in the 1970s and 80s resulted in average spacing ranging from 12 – 14 feet. The canopy has closed since then, so little light reaches the forest floor and understory brush and ground cover are generally sparse. Some of the intermediate trees (crowns are below the main canopy layer) are suppressed and dying.

Understory hemlock and cedar are present, but are very suppressed trees that were too small to cut in the PCT treatments. Dwarf mistletoe is evident on western hemlock throughout the stands.

Two Survey and Manage (S&M) Category C species of lichen were found in the vicinity, but due to the locations the proposed project would have no impact on these species or their habitat. The project area contains suitable habitat for *Bridgeoporus nobilissimus*, a Bureau Sensitive and S&M Category A.

All of the noxious weeds identified during the field surveys are common roadside weed species throughout western Oregon.

There are very few scattered large trees or snags in this young stand type in the proposed project vicinity, and none were found during stand exams in the proposed harvest units. There are a few (5-10 per acre) small diameter (6-10 inches) snags in these stands, and numerous (100-200+/acre, 600-2500 linear ft. /ac) small size CWD, almost entirely in advanced decay classes. No RMP compliant (minimum 20 inches diameter X 20 feet long, Decay Class 1 or 2) pieces of CWD were found.

The project area has site potential tree heights ranging from 180-240. Trees average 12-13 inches in diameter (DBH) with very few trees larger than 24 inches in diameter. Several designated seed trees that are included in the BLM genetics program are found in the project area.

Environmental Effects

2.4.1.1 Proposed Action

- Immediately following treatment the stands should appear healthy, with minimal damage to the residual trees, have approximately the same species mix as before treatment, and appear more open in spacing with larger average stand (see photos 2 & 4, p. 5).
- Some damage to understory plants would be expected in the short run, but within one to three growing seasons the understory vegetation should be more vigorous than before logging and growth should increase until the canopy closes again and vigor begins to decline as the trees compete for light, water and nutrients. This expected cycle would increase stand complexity during this period.
- ***Riparian Reserves:*** In the Riparian Reserve areas, larger diameter trees and understory complexity characteristics of late-successional forest stands would be developed more quickly than they would without thinning because of the increased growth rates for tree and brush species that are expected from reduced competition.
- ***Cumulative Effects:*** The cumulative effects of this thinning and other past, current and future management in the area would treat large portions of the same general stand type in similar ways. It is anticipated that private landowners will harvest timber on a shorter rotation than government agencies. It appears that the patterns of management now evident, including areas where no thinning entries are anticipated, would lead to relatively rapid development of a wide range of age classes, stand densities, and species mixes on a landscape level in the watersheds surrounding the proposed action.
- ***Old Growth Trees, Snags and CWD:*** It is anticipated that no old growth trees or large snags would be affected. Any large CWD found during operations would be left essentially undisturbed. Existing small diameter (6-10 inches) snags that pose a safety hazard (especially the taller, less stable snags) would be felled and left on site. Much of the small diameter CWD (including felled snags) would be broken or at least disturbed by falling and yarding operations.

- Any reserve trees in the Riparian Reserve that are damaged by logging equipment would either heal, or develop growth responses or wood decay fungi that would potentially develop into desirable elements of stand structure. Any reserve trees that must be felled for safety would be left as CWD.
- Accelerated diameter growth, relative to untreated stands, would shorten the time needed to develop and recruit large diameter, hard snags and CWD in the stands in the future. Since there are no large, hard snags or CWD present, levels of these resources would not be reduced by the proposed action.
- ***Invasive Species:*** Noxious weeds populations could increase in vigor in the short run as more sunlight reaches the forest floor after treatment. As the canopy closes over the next 20 years, it is anticipated that they would be shaded out and be reduced again to low-vigor populations. No significant spread or new populations of noxious weeds would be expected to result from the proposed action.
- ***Special Status Species:*** No negative effects to *Bridgeoporus nobilissimus* would be anticipated from the proposed action. Any sites found would be managed according to the *Bridgeoporus* management plan. The goal of this management plan is to provide direction for ensuring the long-term viability of the Clear Lake *Bridgeoporus nobilissimus* population by maintaining habitat conditions; minimizing disturbance to the conks, host trees and stumps; and using silvicultural practices to develop large diameter noble fir and pacific silver fir that can serve as future hosts to this fungus.

2.4.1.2 No Action Alternative

- The stands would continue to develop on their current trajectory. Diameter growth would continue to slow. Intermediate and suppressed trees would continue to lose vigor and eventually die as they fail to compete for light, water and nutrients. This would create an abundance of small diameter snags and CWD over time, which would progress quickly to advanced decay classes. Understory development would continue to be sparse.

2.4.2 Resource: Soil and Site Productivity

From:

Hillock Soils Report
Hillock Silvicultural Prescriptions

Affected Environment

Soil Characteristics

Soils in the project area are generally cryic (cold), have a high rock and gravel content, and low nutrient levels.

Many of the old skid trails have begun to recover productive capability as roots and animal activity have started breaking up compaction and organic material has begun to accumulate. Other old skid trails, typically heavily used main skid roads, have very little vegetation growing in them and show few signs of recovery.

The project area includes some small areas that are unsuitable for timber production (withdrawn from the timber base due to either dry, rocky soil or high water table) and require appropriate protection from impacts.

Roads

Roads are included in this section because the primary environmental effect of roads in this proposed action relate to the productive capacity of the site. Existing roads proposed for use are in a variety of conditions:

- The Hillockburn road is paved.
- Main haul routes are maintained rocked roads.
- Approximately 1.37 miles of road in section 14 have driveable waterbars and unmaintained surfaces.
- Approximately 0.37 mile of roads in section 14 were decommissioned by ripping and seeding and with the subgrade left intact for future renovation and use.
- Approximately 1.0 mile of unmaintained, mostly natural surface roads created by the logging in the 1940s and 50s are dispersed throughout unit 14A and the southern part of unit 12B.

Environmental Effects

2.4.2.1 Proposed Action

- Disturbed soil from yarding would be evident throughout the treated area, with larger areas of disturbed soil in landing areas. These effects would be within the 10 percent maximum compacted area described in the BMP.
- Construction of up to 0.28 mile of new road would displace topsoil and compact subsoil on up to 1.0 acre of forested land, converting it to non-forest land.
- Renovating approximately 1.37 miles of minimally maintained roads with driveable waterbars would not change the existing condition of the underlying soils.
- Renovation of approximately 0.37 mile of currently decommissioned roads would remove vegetation growing on the ripped and seeded subgrade and re-compact the surface during harvest operations on up to 2.3 acres.
- Renovating up to 1.0 mile of old roads as natural surface truck roads to skyline landings would displace and compact soil in unmaintained roadbeds on up to 4.6 acres dispersed over the project area.
- The short term increase in exposed soil from construction or renovation activities, use during operations, and decommissioning would create some surface erosion. The amount of erosion is expected to be slight and not measurable, and all runoff would be diverted onto stable, vegetated slopes where it would infiltrate rapidly into the soil on adjacent vegetated slopes before sediment reaches a stream.
- The design features for treating each of the above roads after operations (shaping and/or ripping roadbeds, partially covering with slash, revegetating, and blocking access) would stabilize the soil surface while leaving the subgrade intact for use in future management operations.
- The subgrades on each of the above roads would remain as non-forest land and be an inactive part of the transportation system between uses for management activities.
- The paved road and maintained rocked roads would remain as part of the transportation system and be maintained according to the Salem District transportation management plan. Little or no additional sediment input would be expected from hauling on these roads with the design features included in the proposed action.

- Ground based yarding on less than 50 acres would perpetuate the existing compaction for the remainder of the timber harvest rotation in the skid roads to be used, a maximum of 10 percent of this area (5 acres). No currently uncompacted ground would be compacted.
- The total expected compaction from road work and ground based yarding would be approximately 13 acres (5 acres from ground based yarding, 8 acres from road work, total of <3% of the project area). Twelve of these 13 acres are already compacted from prior operations.
- Skyline yarding roads with one-end suspension of logs during in-haul would result in a compacted and disturbed trail two to four feet wide for each yarding road.
- Skyline landing construction and use would disturb and compact soil (by cutting and filling to create the landings) in various locations along all roads where they pass through proposed harvest units.
- The combined area compacted by skyline yarding roads and landings would be less than the ten percent of the harvest unit area as stated in the BMP.
- The duff and litter layer would build more quickly in the short term from the immediate addition of a limb and needle mat. Very little woody debris larger than limb size would accumulate for the next two to three decades.
- Cumulative Effects:
  - All land in the truck roads proposed for use are currently functioning as "non-forest, road" and would continue to do so.
  - Up to 1 acre of additional land would be converted from forested to "non-forest, road" by new road construction. This is within RMP guidance.
  - The same or lower levels of effects are expected on lands owned or managed by other firms or agencies with anticipated harvest plans (thinning) on those lands in the next decade.
  - There would be no net increase in open roads on BLM land as a result of the proposed action.
  - There would be a small (not measurable) reduction in site productivity from new compaction and soil disturbance as a result of logging.

2.4.2.2 No Action Alternative

- The paved road and maintained rocked roads would remain as part of the transportation system and be maintained according to the Salem District transportation management plan. They would remain as non-forest land and provide access for management activities and public use.
- The road through section 14 would be left in its current, stable condition, which discourages unauthorized use. It would remain as non-forest land.
- Unmaintained roads and roads previously decommissioned would be left in their current condition. Vegetation and other natural processes would continue to slowly break up compaction and continue the process of recovering productive capability over time, but would remain as non-forest land for the foreseeable future.
- Existing skid trails and dirt truck roads would continue their current rates of recovery, which range from virtually no evidence of recovery to advanced recovery where understory vegetation is similar to adjacent areas and trees are growing in the compacted area.
- The duff and litter layer would continue to build, with a high component of woody debris up to sapling size boles as stem exclusion occurs.

2.4.3 Resource: Water and Hydrology

From:

Hillock Hydrology, Channels and Water Quality Report. (Hydro Report)
Letter dated October 8, 2003 and verbal comments by Bruce Hemenway, South Fork Water Board, captured in IDT meeting minutes.
Hillock Fisheries Report

Affected Environment

The project area is located in the Western Cascades range of Oregon on the ridgelines and adjacent slopes between the Upper South Fork Clackamas River and Clear Creek in the upper reaches of two municipal watersheds represented by the Clackamas Water Providers. Elevations range from 2,000 – 4,000 feet, which is above the elevation band susceptible to rain-on-snow events (transient snow zone). Annual precipitation is 80-90 inches and stream flows are typical of western Cascades streams where peak flows occur during prolonged winter storms and many of the small headwater channels dry up completely during the summer and early fall.

The main stem of the Upper South Fork Clackamas is the only major perennial stream adjacent to any of the proposed harvest units, and is currently in "proper functioning condition" where it passes through BLM lands in the project area. Other sections of the main channel are deficient in large wood and stream adjacent slopes are in early seral stage forest condition.

Other stream channels adjacent to harvest units in the project area are small tributary channels with intermittent or ephemeral flow and channels that frequently disappear underground and reappear as surface streams further downslope. Groundwater and intricate patterns of subsurface flow, as opposed to surface run-off, is apparently the primary system of water delivery to channels in these areas, and steeper channels have a moderate to high potential for debris torrents. One of these streams in section 24 did have a debris torrent in 1996 downstream of the proposed units adjacent to the Clackamas. All other channels viewed in the field in the project area are currently in "proper functioning condition".

There are several municipal water users downstream from the project area in both the Clackamas River system and Clear Creek. Other uses include: domestic use, irrigation, livestock, fish, water contact recreation, industrial water supply, hydro-power and others. The South Fork Water Board represents the municipal water supply users.

Environmental Effects

2.4.3.1 Proposed Action

- The probability that the proposed action would have measurable direct, indirect, or cumulative effects to hydrologic elements is low because it is unlikely to adversely alter the current condition of the aquatic system by affecting in-stream flows, physical integrity, water quality, or sediment regime.
    - Based on modeling and observation of the effects of similar projects, the proposed action is unlikely to directly alter base flow or peak flow events in a measurable manner.
    - The physical integrity of the stream channel and its function would not be negatively affected by the proposed project because there would be no measurable change in stream flow to cause abnormal or project-related changes to the channel characteristics.
    - A long term benefit to the physical integrity and function of the aquatic system would be expected as large trees are available for recruitment as woody structure sooner than they would develop on their current trajectory.

- Riparian forest cover immediately adjacent to streams would maintain riparian microclimate conditions and protect streams from increases in temperature.
- Increases in sediment delivery to streams or changes in the physical integrity or function of the aquatic system due to mass wasting are unlikely because tree removal would not occur on steep, unstable slopes where the potential for mass wasting adjacent to stream reaches is high.
- Road construction, renovation, and related activities would be unlikely to contribute measurable amounts of sediment to streams because all potential runoff would be directed to stable, vegetated slopes where it would infiltrate rapidly.
- Timber harvest in the proposed action would comply with the Clean Water Act and is unlikely to contribute measurable amounts of sediment to streams because implementation of the BMPs (see logging design features) would preclude practices that cause sediment production that could be transported to streams (RMP, Appendix C-1).
- Undisturbed, stable, vegetated slopes adjacent to streams would allow any incidental runoff from logging operations to infiltrate the soil, preventing measurable inputs of sediment into streams.

- Based on the above factors, the proposed action is unlikely to impede and/or prevent attainment of the stream flow and basin hydrology, channel function, or water quality objectives of the Aquatic Conservation Strategy (ACS). (Hydro Report, p. 7)
- Thinning in Riparian Reserves to speed development of structural diversity and growth of large diameter trees and thinning in upland stands would increase stand diversity on a landscape level and would likely promote the achievement of the ACS objectives in these watersheds. (Hydro Report, p.7)
- The proposed action would be unlikely to contribute to any potential adverse cumulative effects to hydrologic functions. (Hydro Report, pp. 11, 12) because:
  - The proposed action is unlikely to have any measurable adverse effects to hydrologic functions, as described above.
  - It is anticipated that timber harvest and silvicultural treatments in the vicinity of the proposed project would be generally limited to commercial and pre-commercial thinning (Silviculture Report, USFS plans, and anticipated activities on private lands based on BLM observations of timber types and historical harvest patterns) for the next 10-20 years. These types of projects are similar in effects and scope to the proposed action and would also be unlikely to have any measurable adverse effects to hydrologic functions.
  - The accelerated growth of larger diameter trees and the structural diversity created by these types of projects on a landscape level are anticipated to contribute to beneficial cumulative effects to hydrologic functions in the long term.

2.4.3.2 No Action Alternative

- Current trends in hydrologic recovery and structural diversity would continue on their present trajectory on the project area.
- Activities similar to the proposed action would likely continue on USFS land and private land in the vicinity of the proposed action with effects similar to those described for the proposed action.

2.4.4 Resource: Wildlife

From:
Hillock Wildlife Report
Hillock Silvicultural Prescription

Affected Environment

Due to the extensive clearcut logging that occurred in the 1940s and 50s, the stands in the project area generally lack horizontal and vertical structural diversity. Trees are relatively uniform in size and composition within each stand, with variation between stands depending mostly on elevation. No remnant old growth trees have been found within the proposed project units. Existing snags and CWD are generally highly decayed, short, and/or small (less than 12 inches) diameter. See the Vegetation section and the *Silvicultural Prescription* for more detailed descriptions.

No special habitats (meadows, talus slopes, cliffs, wetlands) are known within the proposed project area, except as previously described for snags and CWD.

Late Successional Habitat (defined in the South Fork Clackamas Watershed Analysis as "stands dominated by conifers at least 21 inches in diameter") comprises approximately 34 percent of the watershed.

The stands proposed for thinning provide "dispersal habitat" for the northern spotted owl.

No Special Status/Special Attention wildlife species have been found during surveys or otherwise documented to occur in the proposed project units. The habitat in the project area indicates that four of these species are "Possible, but not likely" to inhabit the area (Oregon megomphix (snail), northern goshawk, bald eagle, and northern spotted owl (birds)). Four amphibians (Cascade torrent salamander, Oregon slender salamander, tailed frog and red-legged frog) and one other bird (common nighthawk) are "Suspected, likely to occur" in the vicinity of the project area. Road densities in the vicinity of the proposed project are currently calculated as averaging approximately 4.4 miles of open road per section (one square mile), which is considered high. For wildlife purposes, 3.5 miles per section is the maximum "acceptable" density. Several roads in sections 14 and 36 were closed to all vehicle access in 1997.

Environmental Effects

2.4.4.1 Proposed Action

- General effects to wildlife populations and habitat:
  - Adverse impacts of the project to wildlife and wildlife habitat would be minor and of short duration (5-20 years).
  - Long term positive effects to wildlife would be increased structural and spatial diversity in an area that currently has extensive tracts of young, dense forest stands like those proposed for treatment.
  - No species would be put in jeopardy because the scope of the proposed project is small relative to the amount of similar habitat and because adjacent stands maintain habitat features.
  - Direct impacts to snags: Large snags are very rare or non-existent and any that are found in the harvest area would be protected as described in the Design Features section of this EA. Small diameter snags, especially when tall and/or soft, would typically be felled or knocked over during normal operations, so relatively few of them would remain standing. In the long term (20+ years), larger trees would be available to become snags.

- Impacts to CWD: Much of the existing small diameter CWD would be broken and displaced by logging operations. Snags felled or knocked over by logging operations would add to CWD. The direct adverse impacts to CWD and snags could have short-term (< 10 years) adverse impacts to primary users such as excavators, amphibians and bat species. Adjacent older forests provide high quality structural habitat.
- Microhabitat drying: Opening the canopy would lead to greater seasonal fluctuations in weather related conditions (temperature, humidity and wind) within the stands, but this change is anticipated to be minimal due to the high green tree retention. Only minor impacts to habitat for primary excavators (woodpeckers), amphibians, and bat species that depend on the habitats affected by this type of change. This effect is anticipated to last from ten to twenty years as the canopy grows to a closed condition.
- Any one or combination of these factors could lead to short-term changes in density and distribution of local wildlife populations, favoring some species and disturbing others.
- Observations indicate that the negative effects of these changes are mitigated by natural processes over the following ten to twenty years as canopies close, woody debris is reintegrated into the substrate, trees die and the resulting snags begin to decay, and understory development begins to provide escape and/or thermal cover and foraging opportunities.
- Untreated areas adjacent to the proposed action should act as refugia and/or as source populations for repopulation of the project area by species negatively affected by the proposed action. Untreated Riparian Reserves would provide protection for aquatic amphibians and bats that forage over open water and in riparian areas.
- Cumulative Effects: Based on recent, current and future management plans on all ownerships in the vicinity, it is anticipated that over 700 acres of young (<80 years old) stands would be thinned in the next five years, that large tracts could be thinned over the next two decades, and that private forest land would be regeneration harvested in 20-40 years. This anticipated harvest pattern would continue to provide a wide variety of habitat conditions associated with stand types and seral stages over space and time that would support a wide variety of species.

- Effects to species:
  - The northern spotted owl should not be directly affected by this action since it is not suitable habitat and the nearest known owl site is more than one and a half miles from the project area. As a result of the proposed thinning, dispersal habitat would be degraded for the next decade by opening the canopy, but would remain dispersal habitat.
  - In the long run, the more open canopy would facilitate the growth of understory species which would help to provide the complexity necessary for the formation of suitable spotted owl habitat in the future. This structural complexity would also benefit other species.
  - Thinning would degrade marginally suitable habitat for goshawks for a decade by reducing canopy closures below current levels.
  - The proposed action would have no effect on bald eagles or their habitat. Bald eagles have never been observed in the Hillock area.
  - Individuals of some species, especially amphibians and mollusks that are not mobile (including undetected populations of Survey and Manage species), may be lost from direct impacts of logging. Adjacent untreated stands would provide refugia for other populations of these species.

- Open Road Density:
  - Open road densities would be temporarily increased in the project area during operations.
  - Stabilizing (including "decommissioning") and blocking newly constructed roads and roads that are not currently "open", and gating the road system through section 14 would result in no increase in open road density in sections 12 and 24, and a net reduction of approximately 8,000 feet of open road in section 14.
  - The cumulative effect on open road density for the foreseeable future would be a net reduction compared to the no-action alternative. Overall densities may still increase with activity on other ownerships.

2.4.4.2 No Action Alternative

- Habitat conditions described in the description of the affected environment would remain as described in the Affected Environment sections. Structural and spatial complexity would develop slowly, with the exception of relatively rapid recruitment of small diameter snags and CWD as intermediate and suppressed trees die from competition stresses.
- The small diameter snags and CWD would not be expected to persist into the next rotation on GFMA land.
- The small diameter snags and CWD would not be expected to persist long enough to be present when late successional characteristics develop on the current trajectory in Riparian Reserve stands in a few decades.

2.4.5 Resource: Fisheries and Aquatic Habitat

From:
Hillock Fisheries and Aquatic Habitat Report (Fish Report)
Hillock Hydrology Report (Hydro Report)

Affected Environment

The South Fork Clackamas River (adjacent units 24B&E) and an unnamed tributary draining Williams Lake to the South Fork are the only two fish bearing streams adjacent to any of the proposed harvest units. Cutthroat trout were found in these streams, and sculpins are probably present. Brook trout were stocked in Williams Lake in the 1960s and their presence is assumed, but none have been confirmed recently. More species are found in both the South Fork Clackamas and Clear Creek 5-6 miles downstream of the project area, below barrier falls on both streams. The South Fork Clackamas River is tributary to the North Fork Reservoir and a wide variety of fishes are found both there and in Clear Creek below the barrier falls.

See the Hydrology section for descriptions of streams and channels.

Threatened and Endangered and Special Attention Species: Lower Columbia River steelhead trout, Lower Columbia River Chinook salmon, and Upper Willamette River Chinook salmon, all of which may be found in Clear Creek and the short anadromous reach of the South Fork Clackamas River are listed as 'threatened' under the Endangered Species Act of 1973. Lower Columbia River/Southwest Washington coho salmon are listed as 'threatened' under the State of Oregon Endangered Species Act.

Environmental Effects

2.4.5.1 Proposed Action

- The Riparian Reserves would be adequate to protect the aquatic and riparian resources and habitat in the vicinity of the proposed project as well as downstream in Clear Creek and in the South Fork Clackamas River from any effects of the proposed timber harvest. (Fish Report, p.2; Hydro Report, pp. 7-19)
- In the units where thinning is proposed within the Riparian Reserves, the thinning would not adversely affect aquatic habitat due to the exclusion of ground based equipment from the Riparian Reserves and the No Treatment buffers.
- Tree shade levels would be maintained on stream channels and no increase in water temperature would occur. (Fish Report, p.2; Hydro Report, pp. 7-19)
- No increases in stream sedimentation are expected as a result of the project due to Riparian Reserve retention and the No Treatment buffers in riparian thinning units. Similarly, timber hauling is not expected to result in any increase in sediment input to streams due to the short distances to the paved road and restrictions on hauling during wet road conditions. (Fish Report, p.2; Hydro Report, pp. 7-19)
- The proposed road construction and related activities would be expected to have no impacts on fish or aquatic habitat since the main potential impact of road work on aquatic habitat is increased sedimentation to streams. Road construction and related activities are not expected to deliver enough sediment to have a detrimental effect because: all of the proposed roads to be constructed, renovated, or otherwise disturbed are on ridgetop or midslope locations with no hydrologic connections or proximity to streams; and all ground disturbing operations would be conducted during the dry season. (Fish Report, p. 2) Renovation of Road 5-4E-12.1 would improve surface drainage which, combined with standard practice restrictions on hauling during rainstorms, should maintain sediment delivery to the upper reaches of the Clear Creek watershed to levels below the state of Oregon's water quality limits. (Hydro Report, p. 16)
- A determination has been made that the proposed project would have "No Effect" on ESA listed fish (see above). This determination was based primarily on the distance from the project area to ESA listed fish habitat (> 5 miles downstream), but other project design criteria were also considered, including: prescribed leave tree densities, No Treatment buffers, no ground based equipment in Riparian Reserves, minimal new road construction and all ground disturbing road related activities being only on stable ridgetop and midslope locations, and short hauling distances to paved roads. (Fish Report, p. 3)
- Since no negative impacts to fish or aquatic habitat are expected from the proposed action, no cumulative effects are expected when this project is combined with other projects in the area described in prior sections of this document.

2.4.5.2 No Action Alternative

- No changes, beyond the current trends, would be expected.

2.4.6 Resource: Visual Resources, Recreation and Rural/Urban Interface

From:
Hillock Recreation and Rural Interface Resources Report
Goat Mountain – Clear Lake OHV Damage Restoration and Prevention Report

Affected Environment

A portion of Unit 14A falls within a Visual Resource Management (VRM) Class II category (low levels of change and retention of the existing landscape character) because it would be observable from Clear Lake. At the time it was classified as VRM II, there were roads for full sized vehicles providing access to Clear Lake. These roads were decommissioned and a closure notice issued in the Federal Register in 2002, so there are now few visitors to the lake area.

The remaining proposed harvest units are categorized as VRM Class IV (moderate levels of change and major modifications to the existing landscape character are allowed). No sensitive visual features were identified for these units.

The proposed project area is characterized by a managed forest setting accessed by paved and gravel forest roads. Recreational use of the area (except as described below for project 2) appears to be low to moderate intensity with primary activities consisting of hunting, some fishing, dispersed camping, OHV use, hiking, target shooting and horseback riding.

There are numerous piles of litter and household garbage, concentrations of firearm shells, human waste, and abandoned (often burned) vehicles that negatively affect the recreational quality of the environment in many places.

The proposed project area is not in a Rural Interface Area or near residential property.

Environmental Effects

2.4.6.1 Proposed Action

- A forested setting would be maintained and changes to the landscape character are expected to be low for proposed thinning units because the proposed action would maintain a continuous forest cover.
- No long term effects to other authorized recreational activities would be expected.

2.4.6.2 No Action Alternative

- With the exception of unplanned changes (i.e. wildfire, disease, etc.) no modifications to the landscape character of the proposed units and no changes to recreational activities would be expected to occur.

2.4.7 Resource: Fire Management / Air Quality

From:
Hillock Fuels Management/Fire Ecology Report

Affected Environment

Fuel loadings in proposed harvest units are described as “normal…for young timbered stands in these age classes” (see photos 1 and 3, page 5) The amount of dead wood on the ground is considered to have a low to moderate hazard of wildfire, depending on the weather. A wildfire in these stands with less than extreme fire conditions could be controlled with hand crews, dozers and engines that are available in the area.

In extreme fire conditions, live trees and other vegetation become part of the fuel load and control may be impossible until conditions change, regardless of stand treatment or condition.

The main potential source of ignition in this area is human activity. Unregulated recreational use in the project area is relatively heavy, with evidence of campfires and several abandoned vehicles that have been burned. Recreational use has not produced wildfires in this area in recent decades. Lightning occurs rarely in this area and is generally accompanied by enough rain to prevent fire starts.

Environmental Effects

2.4.7.1 Proposed Action

- The proposed action would increase fuel loadings in the harvested area as a whole (see photos 2 and 4, page 5) with a corresponding increase in potential fire intensity and size if a wildfire were to start. Standard fire behavior modeling indicates that, under less than extreme conditions, a wildfire started in these stands could still be controlled with hand crews, dozers and engines that are available in the area.
- Logging slash and debris would be expected to decay and reduce fuel loading over the next few years to a decade, and mortality from stem exclusion would not be expected to add substantially to fuel loading during that time. These trends would be expected to reduce potential for ignition and wildfire intensity over that time period to lower levels than would be expected under the "no action" alternative.
- With the implementation of project design features, the proposed action would reduce the activity fuels in places with the greatest potential for human caused ignition of wildfires. Blocking roads would prevent vehicle access to areas where fuels had not been reduced. This is expected to keep the probability of ignition at or below the current low levels.
- Pile burning activities, as proposed, would be expected to result in only small, scattered areas of impact to soil productivity, boles and crowns of nearby trees. While some damage would be expected at each pile location, the actual area affected by all of the combined piles is a very small portion of the treated area and the sites are scattered so that no edge effects or other habitat changes would be created.
- ***Air Quality:*** Smoke produced by burning slash piles should have little or no impact on people because the total amount of material to be burned is relatively small, the weather conditions when burning would occur would diffuse smoke quickly, and it is approximately six miles to the nearest residence.

2.4.7.2 No Action Alternative

- Current trends in human activity and related potential for fire starts would be expected to continue. This would be expected to increase the potential for human caused ignition over the next decade.
- Fuel loading in the stands would be expected to increase over the next decade as suppressed trees die during the stem exclusion stage of stand development and dead wood accumulates faster than the decay process reduces fuel loading.

2.4.8 Comparison of Alternatives With Regard to Purpose and Need

Table 5: Comparison of Alternative by Purpose and Need

Purpose and Need (EA section 2.1)	No Action	Proposed Action
Offer a marketable timber sale	Does not fulfill.	Fulfills.
Balance wood volume production, quality of wood, and timber value at harvest.	Meets wood volume production over course of rotation, logs at end of rotation would be smaller diameter which generally reduces quantity, quality and value compared to thinned stands.	Maintains volume production over the course of the rotation, lengthens the rotation some, logs at end of rotation would be larger diameter, which generally increases quantity, quality and value in white wood species compared to unthinned stands.
Maintain a healthy forest ecosystem with habitat to support plant and animal populations and protect riparian areas and water resources	Retains the element of a dense stand with high density, smaller tree diameters and increasing levels of small size CWD for the next decade or more in all stands in the project area.	Retains the element described under "no action" on untreated areas of the stands in the project area and encourages development of larger diameter trees and more open stand conditions in treated areas. This adds an element of diversity over the landscape not provided on BLM lands under the "no action" alternative.
Increase diameter growth rate in Riparian Reserves.	Does not fulfill.	Fulfills by concentrating stand growth on fewer stems.
Restore habitat for riparian-dependent species.	Fulfills by maintaining current trends that develop diversity slowly.	Fulfills by accelerating changes in some parts of some stands to develop more elements of diversity faster.
Provide for structural and spatial stand diversity on a landscape level in the long term.		
Provide access for timber harvest and silvicultural practices.	Partially fulfills. Would delay maintenance on feeder roads, making access for silvicultural practices more difficult. Main routes would be maintained under both alternatives. Would not preclude future maintenance for management activities.	Fulfills. Would implement maintenance on feeder roads, allowing continued access for management activities. Would improve access for management and fire protection in Section 14.
Control access to reduce potential fire ignition, provide fire control and other management access.	Partially fulfills. Access is currently controlled to acceptable levels on most roads. Road through section 14 is barely accessible for fire control in its current condition.	Fulfills. Provides opportunity to block access to section 14 with gates that allow for road control with improved access for fire control and other management.
Reduce environmental effects associated with identified existing roads within the project area.	Does not fulfill. No roads not currently meeting ACS objectives would be stabilized or closed at this time.	Fulfills. Identified roads would be closed or stabilized.

2.4.9 Compliance with Components Aquatic Conservation Strategy Objectives

Table 6 shows this project's compliance with the four components of the Aquatic Conservation Strategy (1/ Riparian Reserves, 2/ Key Watersheds, 3/ Watershed Analysis and 4/ Watershed Restoration).

Table 6: Compliance of Components of the Aquatic Conservation Strategy Objectives for Project 1

ACS Component	Project Consistency
Component 1 - Riparian Reserves	The Riparian Reserve boundaries would be established consistent with direction from the Salem District Resource Management Plan (p. 10). Maintaining canopy cover along all streams and the wetlands would protect stream bank stability and water temperature. Additionally, there would be no road construction within the Riparian Reserve.
Component 2 - Key Watershed	The projects are located within the South Fork Clackamas River and Clear Creek watersheds, which are not designated key watersheds.
Component 3 - Watershed Analysis	The South Fork Clackamas River Watershed Analysis document was completed in February 1997. The Clear Creek/Foster Creek Watershed Analysis document was completed in November 2002. This project is consistent with the recommendations in the Watershed Analyses.
Component 4 - Watershed Restoration	Increasing stand diversity in Riparian Reserves addresses this component.

The effects of the project on the Aquatic Conservation Objectives are summarized by ACS objective in Appendix 2 (EA section 7.2.1).

3.0 PROJECT 2: RESTORATION OF HELENS LAKE SHORE AREA AND GOAT MOUNTAIN OHV TRAILS

3.1 Purpose of and Need for Action

Helens Lake Shore Area – The south shore of Helens Lake has been degraded by unregulated recreational activity so that it no longer meets ACS objectives. It is highly compacted and eroded, is denuded of brush and ground-cover vegetation for 30-50+ feet from water's edge, has evidence of vehicle use (on and off highway) throughout the shore area and into riparian vegetation, is littered, has numerous fire rings, has many trees with ax and other human caused damage, has frequent evidence of human feces scattered throughout the area, and the lower half of a portable toilet has been "placed" by unknown persons in the brush adjacent to the denuded area. There is uninhibited vehicle access from the road adjacent to the east shore of the lake and occasionally a motor vehicle is abandoned and sometimes burned adjacent to the lake and the road. The Land Use Allocation is Riparian Reserve. Sedimentation, litter and potentially hazardous materials are entering Helens Lake and degrading water quality. Direct impacts to vegetation and soils are impacting riparian habitat.

The purpose of the Helens Lake Shore Area portion of the proposed restoration project is to contribute to meeting ACS Objectives by:

- repairing much of the damage done to the lakeshore and adjacent Riparian Reserve,
- cleaning up the area,
- beginning revegetation of the area,
- preventing reoccurrence of the activities that caused the most damage. and
- protecting water quality

Photo 5: Helens Lake Entrance to shore area with tree damage, bare soil and erosion channels.

Photo 6: Helens Lake Shore area with unauthorized fire ring, litter and bare soil

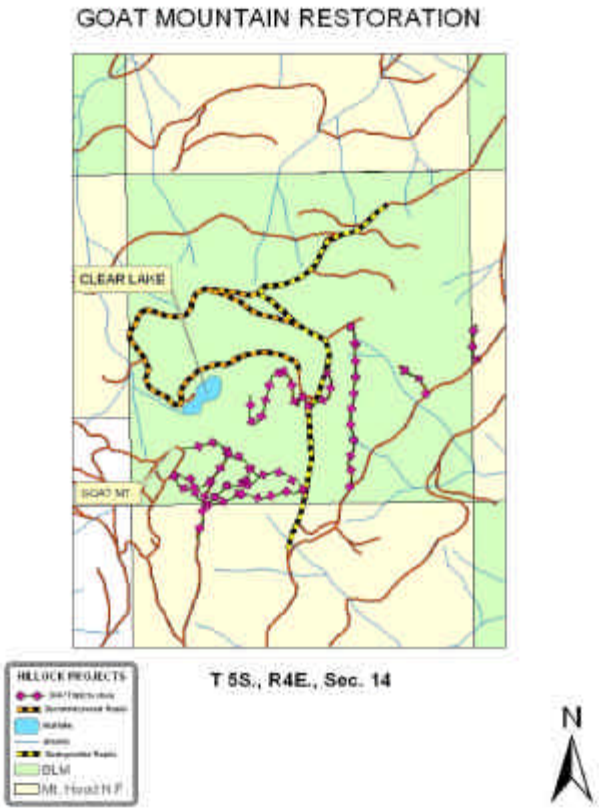
Goat Mountain OHV Trails - Off Highway Vehicles, ranging from motorcycles to full size 4X4 trucks and SUVs, have been used to create a network of unplanned and unauthorized recreational use trails in Section 14 (with some trails extending into adjacent sections). Approximately three miles of these unauthorized trails have been identified so far. The denuded and compacted soil on steep slopes is eroding and introducing sediment into streams. Other trails may be created, or discovered, in the vicinity of the project area between the time of analysis and implementation and would be included in the scope of this analysis. Land Use Allocations include: Matrix, Riparian Reserve, and potentially an Area of Critical Environmental Concern.

The purpose of the Goat Mountain OHV Trail Restoration portion of the proposed project is to contribute to meeting ACS Objectives by:

- repairing erosion damage and compaction on the OHV trails,
- modifying drainage patterns to repair existing erosion and compaction and to minimize or prevent sediment from entering streams,
- and preventing reoccurrence of the activities that caused the damage.

Photos 7 & 8, Goat Mtn. OHV Trails showing typical erosion patterns.

Map 4: Known extent of Goat Mtn OHV trails as of October, 2003.



3.2 Alternatives

3.2.1 Alternative Development

For the Helens Lake Shore Area Restoration portion of Project 2, one unresolved conflict was identified by the IDT. The unresolved issue is: "Should limited parking and camping be provided for, or should parking and camping adjacent to the lake be essentially eliminated?" This led to two alternatives for this portion of Project 2.

For the Goat Mountain OHV trail restoration portion of Project 2, no unresolved conflicts concerning alternative uses of available resources (section 102(2) (E) of NEPA) were identified. An alternative to manage one or more of the OHV trails was proposed, but dropped from further analysis since there has already been a temporary complete closure, pending a full study of OHV and other recreational use which is beyond the scope of this project. No alternatives were identified that would meet the purpose and need of the project and have meaningful differences in environmental effects from the proposed action. Therefore, this EA will analyze the effects of the "proposed action" and the "no action alternative" for the OHV trail restoration portion of Project 2.

3.2.2 Proposed Action

The BLM proposes to restore a damaged alpine lakeshore area and damage associated with unauthorized OHV use and camping to immediately reduce erosion and sedimentation and to speed recovery by natural processes. Restoration includes preventing further damage with barriers to prevent the same type of use.

Helens Lake Shore portion of Project 2, Restoration
The BLM proposes to remove litter, debris, stone fire rings and other unauthorized camping equipment; till compacted soil and revegetate bare soil to prevent erosion and runoff, reduce safety hazards, and set boulders throughout the shore area to prevent unauthorized dispersed camping and lakeshore parking. The area would be available for limited dispersed recreation with one tent site, one fire ring and parking for two vehicles, but no sanitary facilities or tables.

The Goat Mountain OHV Trail portion of Project 2, Restoration
The BLM proposes to stop OHV use on unauthorized OHV trails in the area and to repair damage already done so that natural processes can complete the recovery process. The project would include tilling compacted soil, reshaping erosion channels to drain runoff to stable slopes, revegetating bare soil with native species, and blocking access to the trails.

3.2.2.1 Connected Actions

- Obtain boulders from existing rock quarries.
- Possible falling of hazard trees in the Helens Lake shore restoration area, to be left on site as CWD.
- Obtain native plant seed and transplant stock from a variety of sources.
- Potentially obtain transplant stock from rights-of-way and landings to be constructed as part of the Hillock Timber Sale (Project 1).

3.2.2.2 Project Design Features

Helens Lake Shore Area Restoration:

- Litter (including burned car parts), human waste, hardware, the partial portable toilet and other non-natural material would be removed from the site and disposed of properly. Appropriate personal protective equipment and work methods to protect workers would be required.
- A barrier row of closely spaced boulders would be set adjacent to the existing road to prevent vehicles from entering the lake shore area and to allow roadside parking for two vehicles.
- Additional boulders would be placed throughout the impacted lake shore area to make vehicle access by alternate routes impossible, and to discourage camping except for a single tent site. A single manufactured fire ring would be installed adjacent to the tent site.
- All boulders would be set into the ground to prevent unauthorized moving of the boulders.
- Compacted soils would be tilled as needed to reduce runoff and prepare the site for revegetation. Tilling would include some reshaping to reduce erosion from runoff.
- Revegetation would be done with a combination of: seeding bare soil with native species and mulching with weed-free mulching materials; planting tree and brush species, and allowing adjacent vegetation to spread naturally.
- Machinery operations off of the pavement would be done during dry soil conditions and under the direct supervision of BLM resource specialists. Anticipated machine operations include:
  - Boulder placement with a track hoe or similar machine.
  - Boulder delivery with a dump truck or truck and trailer.
  - Some holes for large transplants may be dug by machine.
  - Tilling of compacted soils with the track hoe or other machinery as needed for seedbed preparation and to promote infiltration.
  - Some shaping of the ground surface to control runoff and promote infiltration.
- Machinery would be cleaned free of weed seeds and plant parts prior to entering BLM lands.
- Educational and regulatory signs may be placed adjacent to the road.
- No toilet facilities or additional camping facilities are proposed as part of this project.

Goat Mountain OHV Trail Restoration:

- The trails would be tilled to break up compaction, promote infiltration of rain water, and provide a seedbed for native plants.
- Drainage patterns would be modified by filling in ruts and shaping slopes, building waterbars, and other techniques to divert potential runoff onto stable, vegetated slopes.
- The existing profiles of the trails would be reshaped to prevent any potential use as an OHV trail.
- Woody debris would be placed on the trail to provide organic matter and to further discourage OHV use of the trails.
- Stream crossings would be shaped to minimize additional sediment input.
- The entrances, and identifiable potential entrances, to the trails would be obliterated and blocked with combinations of trench and berm, stumps, coarse woody debris, boulders, and vegetation.
- The above work would be done with machinery such as a track hoe or “spider” with appropriate attachments.
- All machine operations would be done during periods of dry soil conditions.
- Machinery would be cleaned free of weed seeds and plant parts prior to entering BLM lands.

- Bare soil would be seeded with native species. Some plants may be transplanted from adjacent areas. Weed free mulch may be used as appropriate to expected weather and other factors at the time of seeding.

3.2.3 Alternative 2 – Helens Lake only (Eliminate parking and camping adjacent to Helens Lake)

Alternative 2 is the same as the Proposed Action, except that boulders would be placed immediately adjacent to the road and throughout the affected lake shore area to prevent all vehicle access, parking and camping between the road and the lake.

3.2.4 No Action Alternative

For the Helens Lake Shore Area and Goat Mountain OHV Trail Restoration project, no restoration of existing damage would be done and no physical measures to prevent the activities that are currently causing the damage would be implemented. This alternative also serves to set the environmental baseline for comparing effects to the proposed action.

3.3 Identification of Affected Elements of the Environment

Critical Elements of the Human Environment (BLM H-1790-1, Appendix 5) are in *italics*. Affected elements are **bold**. All entries apply to the all action alternatives, unless otherwise noted.

Table 7: Affected Elements of the Environment for Project 2

PROJECT 2- Helens Lake Shore Area and Goat Mountain OHV Trail Restoration			
Elements Of The Human Environment	**Status: (i.e., Not Present , Not Affected, or Affected)**	**Does this project contribute to cumulative effects? Yes or No**	**Remarks If not affected, why?**
Adverse Impacts on the National Energy Policy	*Not Affected*	*No*	*There are no known energy resources located in the project area. The proposed action will have no effect on energy development, production, supply and/or distribution.*
Air Quality	*Not Affected*	*No*	*No burning is included in the proposal.*
Areas of Critical Environmental Concern(ACEC)	***Affected (Beneficial Effect)***	***No***	***Some of the OHV trails have the potential to encroach into the Williams Lake ACEC. The proposed action has been designed to repair current damage and prevent future damage.***
Cultural Resources	*Not Affected*	*No*	*No known or suspected cultural resources are in the area affected by the proposed action.*
Environmental Justice (Executive Order 12898)	*Not Affected*	*No*	*The proposed action is not anticipated to have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.*
Prime or Unique Farm Lands	*Not Present*	*No*	*The proposed action is not in the vicinity of any farm lands.*
Flood Plains	*Not Affected*	*No*	*The proposed action does not involve occupancy and modification of floodplains, and will not increase the risk of flood loss.*

PROJECT 2- Helens Lake Shore Area and Goat Mountain OHV Trail Restoration			
Elements Of The Human Environment	**Status: (i.e., Not Present , Not Affected, or Affected)**	**Does this project contribute to cumulative effects? Yes or No**	**Remarks If not affected, why?**
Hazardous or Solid Wastes	***Affected***	***No***	***Litter (solid waste) and potentially hazardous human waste and burned car parts would be removed from the natural environment and disposed of properly.***
Invasive, Nonnative Species (plants) (Executive Order 13112)	*Not Affected*	*No*	*Populations already on site would be disturbed, but the types of actions proposed would not be anticipated to spread these species to new locations. Design features would prevent introduction of additional populations.*
Native American Religious Concerns	*Not Affected*	*No*	*No Native American religious concerns were identified during the public scoping period.*
Threatened or Endangered (T/E) Fish Species or Habitat	*Species - Not Present* ***Habitat – Affected***	*No*	*Restoration of potential sources of sedimentation would have a beneficial effect on fish habitat. No known T/E species in the area immediately affected by the proposed action.*
Threatened or Endangered (T/E) Plant Species or Habitat	*Not Affected*	*No*	*No T/E species are known or likely to be present in the areas to be restored.*
Threatened or Endangered (T/E) Wildlife Species or Habitat	*Not Affected*	*No*	*No T/E species are known or likely to be present in the areas to be restored.*
Water Quality (Surface and Ground)	***Affected (Beneficial Effect)***	***No***	***The proposed action would reduce sedimentation currently being produced as described in the Affected Environment.***
Wetlands/Riparian Zones	***Affected (Beneficial Effect)***	***No***	***The proposed action would reduce existing impacts to riparian zones by reducing erosion, revegetating denuded ground with native species and preventing further damage.***
Wild and Scenic Rivers	*Not Present*	*No*	
Wilderness	*Not Present*	*No*	
Coastal zone	Not Present	No	
Fire Hazard/Risk	**Affected (Beneficial Effect)**	**No**	**The proposed action reduces off-road vehicle use and potentially unsafe campfire locations which could be sources of human caused ignition.**
other Fish Species with Bureau Status and Essential Fish Habitat	Not Present	No	These species and habitat are not found in the vicinity of the proposed action.
Land Uses (right-of-ways, permits, etc)	**Potentially Affected (Beneficial Effect)**	**No**	**The proposed action is in accordance with cooperative efforts by USFS and Weyerhaeuser Co. to control access to sensitive environmental sites and a communications site.**
Late Successional and Old Growth Habitat	Not Affected	No	
Mineral Resources	Not Present	No	
Recreation	**Affected**	**No**	**The damage being restored by the proposed action was caused by unregulated, unauthorized recreation activities. The proposed action would reduce the opportunity for OHV hill climbing in the vicinity of the proposed action, and for camping at Helens Lake. It would improve the recreational experience for those people who prefer a quiet, small lake setting without litter and related human impacts as described in the text.**
Rural Interface Areas	Not Present	No	

PROJECT 2- Helens Lake Shore Area and Goat Mountain OHV Trail Restoration			
Elements Of The Human Environment	**Status: (i.e., Not Present , Not Affected, or Affected)**	**Does this project contribute to cumulative effects? Yes or No**	**Remarks If not affected, why?**
Soils	**Affected (Beneficial Effects)**	**No**	**Restores existing damage, including bare soil, compaction and active erosion.**
Special Areas outside ACECs (Within or Adjacent) (RMP pp. 33-35)	Not Present	No	No designated Special Areas (other than Williams Lake ACEC, addressed above). Clear Lake and the north face of Goat Mtn. are not so designated but have some special characteristics that the proposed action would help to protect.
other Special Status Plant Species/Habitat	Not Present	No	
other Special Status Wildlife Species/Habitat	Not Present	No	
Visual Resources	**Affected (Beneficial Effects)**	**No**	**Improvement in visual appeal by cleaning up litter, repairing damage and revegetating bare soils to gain a more natural appearance. No change to large scale visual resources.**
Water Resources – Other (303d listed streams, DEQ 319 assessment, Downstream Beneficial Uses; water quantity, Key watershed, Municipal and Domestic Water Use)	**Affected (Beneficial Effects)**	**No**	**Reduce degradation of water quality that is occurring under current use patterns and conditions.** **Municipal/Domestic Water: Reduces sedimentation that is now occurring under current use patterns and conditions. (Minor effect due to small scope and distance above intake.)**
Wildlife Structural Components (Snags/CWD/Special Habitats)	Not Present	No	

3.4 Affected Environment and Environmental Effects

Those elements of the human environment that were determined to be affected are: vegetation, soil, water, fish habitat, fire, recreation, ACECS, hazardous/ solid wastes, riparian, land uses (permits and rights-of-way), and visual resources. (EA section 3.3). This section describes the current condition and trend of vegetation, soil, water, fish habitat, fire, and recreation, and the environmental effects of the alternatives on those elements. The remaining affected elements are described in Table 7. The references cited are the same as for Project 1.

3.4.1 Vegetation

Affected Environment

Helens Lake – The forest stands immediately surrounding Helens Lake are brush and old-growth forest. Vegetation on the south side of the lake has been denuded for 30-50 feet from water's edge, some human caused damage to riparian vegetation is evident, and many of the trees on this shore have been damaged by campers, some to the point that they appear to be a safety hazard.

Goat Mountain OHV Trails – Most of the OHV trails run through the same types of forest stands described for Project 1, though they also run through rocky meadows near the summit of Goat Mountain.

Environmental Effects

3.4.1.1 All Action Alternatives

Helens Lake (Proposed Action and Alternative 2):

- Other than possibly felling hazard trees, no additional impacts to existing native vegetation would be anticipated from the proposed action around Helens Lake.
- Some vegetation in the vicinity may be cut by people using the single campsite and fire ring. The intensity is expected to be low because only one campsite would be used.
- The campsite and parking area would not revegetate to the same degree as the rest of the shore area.

Goat Mtn. (Proposed Action):

- Some vegetation, CWD, young trees and snags immediately adjacent to the OHV trails would likely be disturbed while shaping the trails to make them unusable for OHV use and to direct drainage to stable slopes. The ground cover vegetation would be expected to re-grow quickly, including becoming established in new fill on the old trails as it re-sprouts from roots in the displaced soil. Some of the displaced plants may be transplanted into the bare area. The woody debris used to litter the surface of the old trails would become incorporated into the site over time.
- Native species seeded on part or all of the trail system would establish quickly to stabilize soil, then the species most suited to the site would dominate the site over time.

3.4.1.2 Alternative 2 – Helens Lake (Eliminate parking and camping)

- The full shoreline area would revegetate from seeding, planting and natural spreading of adjacent vegetation.

3.4.1.3 No Action Alternative

- Human activity would keep vegetation from becoming re-established on the denuded areas and would likely expand the impacted area, both adjacent to Helens Lake and by extending the OHV trails system.

3.4.2 Soil

Affected Environment

Helens Lake: The soils affected by the unauthorized recreational activity are the same types as described under Project 1. The slopes adjacent to the lake are gentle, so erosion channels are shallow. Soils have been compacted by unauthorized vehicle use and are impacted by heavy foot traffic.

Goat Mtn: Since much of the OHV trail system is on steep ground and ruts are initially developed by spinning tires on impermeable, compacted soil, erosion channels are often several feet deep. When they get so deep that OHVs can no longer negotiate that section of road, a new trail is often created nearby, creating parallel areas of erosion channels.

Environmental Effects

3.4.2.1 Proposed Action

Helens Lake, Both Action Alternatives: Tilling, modifying drainage and revegetating the bare soils would allow rainfall and snow melt to infiltrate, reducing erosion on the site.

Goat Mtn: Reshaping the OHV trail surfaces would immediately reduce erosion by slowing the velocity of water and directing runoff to stable, vegetated slopes. Tilling compacted soil would reduce runoff and erosion by allowing more infiltration, and by providing a seed bed for revegetation. Revegetation and organic debris loading would hold the soil in place and reduce rain impact, approaching complete elimination of erosion on these OHV roads over two to five years.

3.4.2.2 No Action Alternative

- Current erosion patterns would continue adjacent to Helens Lake and on existing OHV trails.
- New trails would likely be created, causing similar erosion patterns on additional area.

3.4.3 Water

Affected Environment

Constant disturbance of the denuded soil on the shore of Helens Lake, litter, human waste, and direct impacts from foot and even vehicle traffic in the wet areas of the shore line negatively impact water quality in the lake by increasing sedimentation, coliform bacteria, and nitrates; and reducing available oxygen levels.

Some of the OHV trails cross streams and others are near streams, so some of the erosion channels on the OHV trails introduce large amounts of sediment directly into stream channels.

Environmental Effects

3.4.3.1 Proposed Action

Helens Lake – allow for limited parking and camping

- The proposed action would immediately reduce the activities that are causing the impacts, clean up existing problems, and revegetate denuded soil. This would immediately reduce direct inputs of sediment, litter and human waste into the lake.
- The proposed action would immediately reduce mechanical damage from vehicles and foot traffic to shorelines and aquatic habitat.

- Allowing limited activity would hopefully encourage responsible use by those who do recreate here. However, some impacts from human activity, including litter and waste, would still be expected, though on a much more limited scale than with current activities.

Goat Mountain OHV Trails

- Shaping of the channel and banks where OHV trails cross streams would expose some unstable soil in and immediately adjacent to streams, which may add some sediment to the stream from that immediate area.
- Shaping the existing erosion channels would immediately reduce the sediment input into streams.
- The combined effect would be an immediate reduction in net sediment input into streams and further long term reduction as disturbed soil becomes stable and revegetated over the next one to five years.

3.4.3.2 Alternative 2

Helens Lake – Do not allow parking or camping: Alternative two would reduce human impacts to the shore area and sediment, waste and litter inputs to the lake even more than the proposed action, but some litter, waste, and campfire activity is still likely to occur.

3.4.3.3 No Action Alternative

- Human activity would continue to increase the types of impacts to Helens Lake, including sediment and waste input into the lake and damage to the shoreline as described under Affected Environment.
- Established erosion patterns and continued use would increase the sediment input into streams impacted by OHV trails on Goat Mtn.

3.4.4 Fish

Affected Environment

Helens Lake is shallow and generally not considered suitable fish habitat, there are no known fish populations in the lake. Known fish populations are far enough downstream of OHV trail crossings that direct effects from sedimentation are not apparent, beyond general degradation of water quality in the drainage.

Environmental Effects

3.4.4.1 Proposed Action

Helens Lake: Since Helens Lake is not suitable habitat for fish, no impacts to fish are expected from either action alternative.

Goat Mtn.: The proposed action would improve water quality by reducing inputs of sediment and other pollutants to streams, with resultant minor, benefits to fish downstream of the project area.

3.4.4.2 No Action Alternative

Inputs of sediment and other pollutants would continue or increase and continue to slightly degrade general fish habitat.

3.4.5 Fire

Affected Environment

Unregulated camping and OHV activity provide potential human caused ignition opportunities, many of them far off of roads so that detection and suppression are difficult. These types of fires are common in other areas where unregulated recreation is common and would be expected at some point in this area.

Environmental Effects

3.4.5.1 All Action Alternatives, Helens Lake and Goat Mtn. OHV Trails

- Restricting access to most or all of the Helens Lake shore area and to the OHV trails would reduce the potential for human caused fires in these areas.

3.4.5.2 No Action Alternative

- Existing and future recreation use in both areas in both areas is expected to increase the potential for human caused fires.

3.4.6 Recreation

Affected Environment

Helens Lake appears to receive regular use for unregulated, dispersed camping with inappropriate collateral activities such as litter, vehicles in the shore area, damage to vegetation, tree damage, multiple fire rings, and disposal of human waste. Vandalism, including burning vehicles, has also occurred adjacent to the lake as well as other locations in the vicinity.

The vicinity provides a forest setting for dispersed recreation including camping, fishing, hunting, OHV use, target shooting, hiking and horseback riding. Goat Mountain and two other alpine lakes in the area (Williams and Clear Lakes) have previously been closed to public vehicle access by gates, physical road closure, and Federal Register Notice in a cooperative effort with BLM, USFS and private landowners. Closing motorized vehicle access to the two lakes has been largely successful in keeping full size vehicles out but not as successful in preventing access by smaller OHVs. Gating the road system to Goat Mountain has not been successful due to unauthorized creation of multiple OHV trails, some of which circumvent the gates.

The current Off-Highway Vehicle Designation for the general area is "Limited to Existing Roads and Designated Trails." The existing off-road trails were evaluated and found to be "unsuitable for designation" due to resource concerns associated with steep slopes (many steeper than 45 percent), fragile soils, and sediment inputs to streams. It appears that new routes are created fairly frequently, either into new areas or detours around sections that are no longer negotiable. Use of existing BLM-administered gravel roads is still permitted.

None of these areas are in a Rural Interface Area or near residential property.

Environmental Effects

3.4.6.1 Proposed Action

Helens Lake, limited parking and camping

- There would be a reduction of dispersed camping near water features and the potential group size at this site would be reduced. The number of potential dispersed lake shore campsites would be reduced from the current room for several tent sites with campfires to one site. Parking would be reduced from room for several vehicles dispersed through the shore area to roadside parking for two vehicles.
- The aesthetic quality of the shore area of Helens Lake would be enhanced immediately by cleanup, and continue to improve as denuded soil is revegetated.
- The safety of visitors to Helens Lake would be improved by removal of hazardous litter, human waste, and hazard trees.
- It is anticipated that less litter would occur after cleanup, both because of the psychological effect of maintenance and because it would be harder to get off of the road for disposal. Some litter associated with walk-in camping and day use may still occur.
- The overall camping experience for some people would be improved by reducing garbage and evidence of vandalism. The overall experience for others would be negatively affected by restricting access.
- Some additional unauthorized dispersed campsites may be developed in the vicinity outside of the project area.
- The cumulative effect to recreation would be a small reduction in dispersed camping near water features on BLM-administered lands.

Goat Mtn.

- Physical barriers and restoration efforts would discourage continued use of off-road trails by motorized vehicles. Use of existing BLM-administered gravel roads would still occur.
- The cumulative effect to recreation would be a small reduction of off-road use opportunities by motorized vehicles on BLM administered lands.

3.4.6.2 Alternative 2

Helens Lake, eliminate parking and camping: The immediate and cumulative effects would be the same as for the proposed action except that the current sites would no longer provide camping opportunities in the project area.

3.4.6.3 No Action Alternative

- Camping, OHV use, litter and dumping, and other activities would be expected to continue current activities and trends.

3.4.7 Comparison of Alternatives With Regard to Purpose and Need

Table 8: Comparison of Alternative by Purpose and Need

Purpose and Need (EA section 3.1)	No Action	Proposed Action Helens Lake, restoration with limited parking and camping. Goat Mtn., restoration and blocking OHV trails.	Alternative 2 Helens Lake, restoration without parking or camping. Does not affect Proposed Action for Goat Mtn. OHV trails.
Helens Lake shore area: repair damage, clean up, and revegetate.	Does not fulfill.	Fulfills.	Fulfills.
Prevent reoccurrence of damaging activities.	Does not fulfill.	Largely fulfills. Isolates and restricts camping and vehicle access, the two most damaging activities, to small part of the site.	Fulfills. Essentially eliminates vehicle access and camping, the two most damaging activities.
Protect water quality in Helens Lake	Does not fulfill.	Fulfills.	Fulfills.
Goat Mtn. OHV trails: repair erosion damage and compaction, modify drainage.	Does not fulfill.	Fulfills	Does not apply.
Minimize or prevent sediment from entering streams.	Does not fulfill.	Fulfills. Minimizes sediment in short run, essentially prevents it in the long run.	Does not apply.
Prevent reoccurrence of damage causing activities.	Does not fulfill.	Fulfills. Prevents continued use and expansion of existing OHV trails.	Does not apply.

3.5 Compliance with Components Aquatic Conservation Strategy Objectives

Table 9: Compliance of Components of the Aquatic Conservation Strategy Objectives for Project 2

ACS Component	Project Consistency
Component 1 – Riparian Reserves	Repairs damage to soil and revegetate bare ground in Riparian Reserves under both action alternatives. Proposed action allows and controls limited dispersed camping in an established site, which is expected to prevent almost all of the damaging activities in the Helens Lake shore area in the future. Alternative 2 eliminates camping, preventing more of the potentially damaging activities.
Component 2 – Key Watershed	The projects are located within the South Fork Clackamas River and Clear Creek watersheds, which are not designated key watersheds.
Component 3 – Watershed Analysis	The South Fork Clackamas River Watershed Analysis document was completed in February 1997. The Clear Creek/Foster Creek Watershed Analysis document was completed in November 2002. This project consistent with the recommendations in the Watershed Analyses.
Component 4 – Watershed Restoration	The proposed action was designed to contribute to meeting the "restore" objectives for riparian habitat and water quality. Repairing existing damage in the Riparian Reserves addresses this component.

The effects of the project on the Aquatic Conservation Objectives are summarized by ACS objective in Appendix 2 (EA section 7.2.1).

4.0 LIST OF PREPARERS

Table 10: List of Preparers

Resource	Name	Initial	Date
Silviculture	Dan Schlottmann	CDS for DS	5/19/04
Cultural Resources	John Caruso (retired)	[illegible]	5/19/04
Hydrology/ Water Quality/Soils	Patrick Hawe	WPH	5/18/04
Riparian Ecology	Dave Rosling, Dan Schlottmann	DJR	5/18/04
Botany TES and Special Attention Plant Species	Terry Fennell	TGF	5/18/04
Wildlife TES and Special Attention Animal Species	Jim Irving	JAI	5/19/04
Fire	Sam Caliva	[illegible]	5/19/2004
Fisheries	Dave Roberts	DAR	5/19/04
Recreation Sites and Visual Resources Management and Rural Interface	Laura Graves	CDS for LG	5/19/04
NEPA	Carolyn Sands	CDS	5/19/04
Plans	Vince Cargile	VC	5-17-04
Logging	Keith Walton	[illegible]	5/17/04
Engineering	Steve Ditterick	SLD	5/19/04
Soils	Wesley Wong	[illegible]	5/18/04

5.0 CONTACTS AND CONSULTATION

5.1 Agencies, Organizations, and Persons Consulted

5.1.1 ESA Section 7 Consultation

1. US Fish and Wildlife Service

The Hillock proposal was submitted for Formal Consultation with U.S. Fish and Wildlife Service on September 3, 2002. Consultation with the USFWS resulted in a "May Affect, Not Likely to Adversely Affect" Determination for northern spotted owl. The resulting **Biological Opinion dated February 27, 2003 (FWS reference: 1-7-03-F-0008)** concurred with the above finding. All applicable terms and conditions from the Biological Opinion would be incorporated into the project design features.

2. **NOAA Fisheries (NMFS) – Endangered Species Act Determination of Effect for Lower Columbia River steelhead trout, Lower Columbia River Chinook salmon and Upper Willamette River Chinook salmon.**

A determination has been made that the proposed project would have "No Effect" on ESA listed fish (see EA section 2.4.5 and EA Appendix 1, *Endangered Species Act Determination of Effect for Lower Columbia River steelhead trout, Lower Columbia River chinook salmon and Upper Willamette River chinook salmon*). As a result of the "No Effect" determination, no consultation with NOAA Fisheries for ESA listed fish species is required.

5.1.2 Cultural Resources - Section 106 Consultation and Consultation with State Historical Preservation Office:

Compliance documented July 8, 2002 and November 22, 2002.

5.2 Public Scoping and Notification

5.2.1 Tribal Governments, Adjacent Landowners, General Public, and State County and local government offices:

A Scoping letter was mailed September 30, 2003 to approximately 30 potentially interested parties. Three comment letters were received. See Appendix 3.

5.2.2 30-day public comment period:

The EA and FONSI will be made available for public review May 19, 2004 to June 18, 2004. The notice for public comment will be published in a legal notice by the Clackamas County News newspaper; and posted on the Internet at http://www.or.blm.gov/salem/html/planning/index.htm under Environmental Assessments. Comments received by the Cascades Resource Area of the Salem District Office, 1717 Fabry Road SE, Salem, Oregon 97306, on or before June 18, 2004 will be considered in making the final decisions for this project.

6.0 MAJOR SOURCES AND COMMON ACRONYMS

6.1 Major Sources

Specialists' reports can be found in the Hillock Project file. These reports are available for review at the Salem District Office.

Caliva, S. 2004., *Hillock Fuels Management /Fire Ecology Interdisciplinary Team Review.* [Fuels Report] Cascades Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Ditterick, S., 2004. *Hillock Timber Sale Road Status.* Cascades Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Fennell, T., 2003. *Hillock Thinning Timber Sale - Biological Evaluation for Special Status Plant Species/Survey & Manage Species and Noxious Weeds.* [Botany Report] Cascades Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Graves, L., 2004. *Hillock Timber Sale and Restoration Projects – Recreation and Rural Interface Resources.* [Recreation Report] Cascades Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Graves, L., 2004. *Hillock Timber Sale and Restoration Projects – Visual Resources Report.* [VRM Report] Cascades Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Hawe, P., 2003. *Hydrology/Channels/Water quality: Environmental Assessment for the Proposed Hillock Project.* [Hydrology Report] Cascades Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Irving, J., 2003. *FY 2004 Hillock, Affected Resource: Wildlife.* [Wildlife Report] Cascades Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Roberts, D., 2003. *Hillock Timber Sale Fisheries and Aquatic Habitat.* [Fisheries Report] Cascades Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Roberts, D., 2003. *Hillock Timber Sale – Endangered Species Act Determination of Effect for Lower Columbia River Steelhead Trout, Lower Columbia River Chinook Salmon and Upper Willamette River Chinook Salmon.* [Fish Effect Determination] Cascades Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Rosling, D., 2003. *Hillock EA Input, Riparian Reserves.* [Riparian Ecology Report] Cascades Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Schlottmann, D., 2004. *Silvicultural Prescriptions – Commercial Thinning, Hillock.* [Silvicultural Prescription] Cascades Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Walton, K., 2004. *Preliminary Logging Systems Assessment.* [Preliminary Logging Plan] Cascades Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Wong, W., 2003. *Hillock Timber Sale Soils Report.* [Soils Report] Cascades Resource Area, Salem District, Bureau of Land Management. Salem, OR.

USDI. Bureau of Land Management. 1995. Salem District Record of Decision and Resource Management Plan. Salem, OR. (RMP)

6.2 Common Acronyms

ACS – Aquatic Conservation Strategy
BLM – Bureau of Land Management
BMP – Best Management Practice(s)
BO – Biological Opinion
CON – Connectivity land use allocation (Matrix)
CWD – Coarse Woody Debris
DBH – Diameter Breast Height
EA - Environmental Assessment
ESA – Endangered Species Act
FONSI – Finding of No Significant Impact

GFMA – General Forest Management Area land use allocation (Matrix)
HUC# - Hydrologic Unit Code Number (US Geological Survey)
LSRA – Late Successional Reserve Assessment (1996)
LWD – Large Woody Debris
NEPA – National Environmental Policy Act (1969)
NOAA – National Oceanic Atmospheric Administration (National Marine Fisheries Service (NMFS) is now called NOAA Fisheries)
NWFP – *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Related Species within the Range of the Northern Spotted Owl* (1994) (Northwest Forest Plan)
RMP – *Salem District Record of Decision and Resource Management Plan* (1995)
RMPFEIS – *Salem District Proposed Resource Management Plan / Final Environmental Impact Statement* (1994)
ROW – Right-of-Way (roads)
RR – Riparian Reserves (land use allocation)
SPZ – Stream Protection Zone (no-cut protection zone/no-cut buffer/no-treatment Zone /stream buffer)
USDI – United States Department of the Interior
USFS – United States Forest Service
USFWS – United States Fish and Wildlife Service

7.0 APPENDICES

7.1 Appendix 1 – ESA Determination of Effect on Listed Fish

Hillock Timber Sale

Endangered Species Act Determination of Effect for Lower Columbia River steelhead trout, Lower Columbia River chinook salmon and Upper Willamette River chinook salmon

CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS OF PROPOSED ACTION(S) ON RELEVANT INDICATORS FOR THE WILLAMETTE PROVINCE

Administrative Unit: Salem District BLM Basin/Section 7 Watershed: Project: **Hillock Timber Sale**

FACTORS / INDICATORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
	Properly Functioning	At Risk	Not Proper. Functioning	Restore	Maintain	Degrade
Water Quality: Temperature					X	
Sediment/Turbidity					X	
Chem. Contam./Nut.					X	
Habitat Access: Physical Barriers					X	
Habitat Elements: Substrate					X	
Large Woody Debris (LWD)					X	
Pool Frequency					X	
Pool Quality					X	
Off-Channel Habitat					X	
Channel Cond. & Dyn.: Width/Depth Ratio					X	
Streambank Condition					X	
Floodplain Connectivity					X	
Flow/Hydrology:					X	
Peak/Base Flows Drainage Network Increase					X	
Watershed Condition: Road Dens. & Loc.					X	
Disturbance History					X	
Riparian Reserves					X	

7.1.1 Water Quality

7.1.1.1 Temperature

Temperature in all streams would be maintained by retaining all vegetation within a minimum of 50 feet of all streams, and tree selection for thinning in the Riparian Reserves that would be designed to ensure that existing shade levels would be maintained on stream channels and no increase in water temperature would occur.

7.1.1.2 Sediment/turbidity

The following project design criteria and site conditions are expected to prevent any increase in sediment in stream channels or any increase in stream turbidity in habitat occupied by ESA listed fish species:

- No harvest activity within a minimum of 50 feet of any stream channel.
- Exclusion of all ground-based equipment from Riparian Reserves.
- Requirement of water-bars on cable yarding corridors where gouging occurs on soils sensitive to erosion.
- Ridgetop and near-ridgetop locations (with no hydrologic connections) of all three new road segments proposed for construction.
- Post-project leave tree densities of **90-120** trees per acre (tpa) throughout the project area.
- Very short distances (maximum of ~1.5 miles) to haul timber on unpaved roads prior to reaching pavement.
- **Contract requirement to suspend timber hauling if necessary to prevent road related sediment from entering streams if sediment traps/filtering were not adequate to prevent fine sediment delivery from the haul route to the stream systems**.
- Approximate distance of 5.5 – 6.5 miles downstream from the project area to ESA listed fish habitat.

7.1.1.3 Chemical contamination/nutrients

No activities associated with the project would increase chemical or nutrient pollution except a low probability event such as an accidental spill or vehicle accident.

7.1.2 Habitat Access

7.1.2.1 Physical Barriers

No barriers to fish migration would result from the project.

7.1.3 Habitat Elements

7.1.3.1 Substrate, Large Woody Debris, Pool Frequency, Pool Quality, Off-channel Habitat

No project activities would occur sufficiently close to stream channels or create enough disturbance to affect any of the above instream habitat elements in the streams in the project area or in streams utilized by ESA listed fish approximately 5.5 – 6.5 miles downstream from the project area.

7.1.4 Channel Conditions and Dynamics

7.1.4.1 Width/depth ratio, Streambank Condition, Floodplain Connectivity

No project activities would occur sufficiently close to stream channels or create enough disturbance to affect any of the above channel conditions in stream channels in the project area or in streams utilized by ESA listed fish approximately 5.5 – 6.5 miles downstream from the project area.

7.1.5 Flow/Hydrology

7.1.5.1 Peak/base Flows

A preliminary analysis of the risk of increases in peak flows as a result of forest harvest was conducted using the Oregon Watershed Assessment Manual watershed analysis methods for forest hydrology. Current conditions in the project area indicate a low risk for peak flow enhancement in both watersheds. Since the proposed action will maintain all treated stands at no less than 40% crown closure, this proposal results in no additional risk. For analysis of the potential effects of the project on peak/base flows see the Hydrology report and section 2.4.3.1 of the EA.

7.1.5.2 Drainage Network Increase

There would be no increase in the drainage network due to roads as a result of the project since there none of the road segments proposed for construction have any hydrologic connection.

7.1.6 Watershed Conditions

7.1.6.1 Road Density & Location

Approximately 1,500 feet of new road are proposed for construction, but none of the proposed new road segments are in locations that would affect watershed hydrology or affect stream habitat in the project area or approximately 5.5 – 6.5 miles downstream where ESA listed fish species may be found.

7.1.7 Disturbance History

The project would not result in an increased level of disturbance. Post-project stand densities would be **90-120 tpa**; no ground-based equipment would be allowed in Riparian Reserves, and no project activities would be conducted in unstable areas.

7.1.8 Riparian Reserves

Commercial thinning of approximately **50** acres of Riparian Reserves is proposed. Post-project stand densities of **90-120 tpa** are expected to leave intact, fully functional Riparian Reserves and trees with increased growth potential as a result of reduction of competition for resources.

For the reasons stated in the preceding pages the Hillock Timber Sale is expected to have '**no effect**' on any of the factors evaluated in Table 1, Matrix of Pathways and Indicators, in Clear Creek or the South Fork Clackamas River. Therefore, the project is expected to have '**no effect**' on Lower Columbia River steelhead trout, Lower Columbia River chinook salmon or Upper Willamette River Chinook salmon.

The project is also expected to have '**no effect**' on Essential Fish Habitat as defined in the Magnuson-Stevens Act.

7.2 Appendix 2 - Aquatic Conservation Strategy Objectives

7.2.1 Documentation of the Hillock Projects' Consistency with the Nine Aquatic Conservation Strategy Objectives

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

Alternative 1: No Action

The No Action alternative would maintain the development of the existing vegetation and associated stand structure at its present rate. The current distribution, diversity and complexity of watershed and landscape-scale features would be maintained. *Does not retard or prevent the attainment of ACS Objective 1.*

Alternative 2: Proposed Action

- Project 1 (Timber Harvest and Associated Silvicultural Treatments):

  Over time the proposed treatments are expected to result in forest stands that exhibit attributes typically associated with stands of a more advanced age and stand structural development. (Larger trees, a more developed understory, an increase in the number, size and quality of snags and down logs). The net effect of this would be a more diverse and structurally complex landscape that would help to protect and enhance adjacent aquatic ecosystems. *Does not retard or prevent the attainment of ACS Objective 1.*
- Project 2 (Helens Lake Shore Area and Goat Mountain OHV Trail Restoration):

  Unauthorized OHV activity and unauthorized development of campsites has created adverse impacts. Project 2 would prevent further degradation and would begin repair and restoration of natural vegetation in the affected areas. *Does not retard or prevent the attainment of ACS Objective 1.*

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

Alternative 1: No Action

The No Action alternative would have little effect on the connectivity of those features except that temporally restoration would occur over a longer period of time. The current condition of connectivity would be maintained. *Does not retard or prevent the attainment of ACS Objective 2.*

Alternative 2: Proposed Action

- Project 1 (Timber Harvest and Associated Silvicultural Treatments)

  The proposed action would have little direct effect on connectivity between watersheds due to the ownership patterns that exist and the large tracts of similar stands on multiple ownerships. However, by restoring stand structural elements that provide habitat and refugia, it is anticipated that it would help to strengthen local connectivity within the watershed. *Does not retard or prevent the attainment of ACS Objective 2.*
- Project 2 (Helens Lake Shore Area and Goat Mountain OHV Trail Restoration)

  The proposed restoration treatments would have little direct effect on connectivity between watersheds due to the discontinuous ownership patterns that exist. However, by preventing additional damage restoring stand structural elements that provide habitat and refugia, it is anticipated that it would help to strengthen local connectivity within the watershed. *Does not retard or prevent the attainment of ACS Objective 2.*

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

Alternative 1: No Action

The current condition of the physical integrity of the aquatic system would be maintained. *Does not retard or prevent the attainment of ACS Objective 3.*

Alternative 2: Proposed Action

- Project 1 (Timber Harvest and Associated Silvicultural Treatments)
  This proposal is unlikely to alter the current condition of channels in the project area. Minimization of direct disturbances from the proposed action (e.g. increased flows or sediment delivery) is likely to result in the maintenance of stream channels in their current condition. *Does not retard or prevent the attainment of ACS Objective 3.*
- Project 2 (Helens Lake Shore Area and Goat Mountain OHV Trail Restoration)
  The portion of the project on the shore of Helens Lake is designed specifically to "restore the physical integrity of…shorelines, banks…" The Goat Mt. portion would not have direct effects on aquatic system. *Does not retard or prevent the attainment of ACS Objective 3.*

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

Alternative 1: No Action

The current condition of water quality would be maintained. *Does not retard or prevent the attainment of ACS Objective 4.*

Alternative 2: Proposed Action

- Project 1 (Timber Harvest and Associated Silvicultural Treatments)
  Overall, this proposal is unlikely to have any measurable effect on stream temperatures in this watershed. BMPs and other design features are proposed to eliminate and/or limit, acceleration of sediment delivery to streams in the project area. As a result, it is unlikely that this proposal would lead to a measurable increase in sediment delivered to streams, stream turbidity, the alteration of stream substrate composition, or sediment transport regime. Since the proposed action is unlikely to result in any measurable increase in stream temperature or sedimentation, and would not place large amounts of fine organic material in the stream, it is unlikely that this proposal would have any measurable effect on dissolved oxygen levels in project area streams. D*oes not retard or prevent the attainment of ACS Objective 4.*
- Project 2 (Helens Lake Shore Area and Goat Mountain OHV Trail Restoration)
  This project is designed to contribute to restoring water quality by repairing damage done by unauthorized activities. D*oes not retard or prevent the attainment of ACS Objective 4.*

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

Alternative 1: No Action

The current condition of the sediment regime would be maintained. *Does not retard or prevent the attainment of ACS Objective 5.*

Alternative 2: Proposed Action

- Project 1 (Timber Harvest and Associated Silvicultural Treatments)

  BMPs and other design features are proposed to eliminate and/or limit acceleration of sediment delivery to streams in the project area. As a result, it is unlikely that this proposal would lead to a measurable increase in sediment delivered to streams, stream turbidity, the alteration of stream substrate composition, or sediment transport regime. *Does not retard or prevent the attainment of ACS Objective 5.*
- Project 2 (Helens Lake Shore Area and Goat Mountain OHV Trail Restoration)

  This project is designed to restore the sediment regime by repairing damage that is introducing sediment levels in excess of the regime under which the aquatic ecosystem evolved. D*oes not retard or prevent the attainment of ACS Objective 5.*

ACS Objective 6. Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.

Alternative 1: No Action

The current condition of in-stream flows would be maintained. *Does not retard or prevent the attainment of ACS Objective 6.*

Alternative 2: Proposed Action

- Project 1(Timber Harvest and Associated Silvicultural Treatments)

  Considering the small percentage of the watershed's coniferous forest that would be altered, the effect to base flows and peak flows is not likely to be measurable. The cumulative effects analysis found low sensitivity to increases in peak flows and low potential risks for aquatic resources for normal storm events. *Does not retard or prevent the attainment of ACS Objective 6.*
- Project 2 (Helens Lake Shore Area and Goat Mountain OHV Trail Restoration)

This action would have no adverse effect on timing, magnitude, duration, and spatial distribution of peak, high, and low flows. *Does not retard or prevent the attainment of ACS Objective 6.*

ACS Objective 7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

Alternative 1: No Action

The current condition of floodplain inundation and water tables would be maintained. *Does not retard or prevent the attainment of ACS Objective 7.*

Alternative 2: Proposed Action:

- Project 1(Timber Harvest and Associated Silvicultural Treatments)

  The current condition of floodplain inundation and water tables would be maintained. *Does not retard or prevent the attainment of ACS Objective 7.*
- Project 2 (Helens Lake Shore Area and Goat Mountain OHV Trail Restoration)

  This action would have no adverse effect on floodplain inundation and water tables. *Does not retard or prevent the attainment of ACS Objective 7.*

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

Alternative 1: No Action

The current condition of plant communities within riparian areas would be maintained. *Does not retard or prevent the attainment of ACS Objective 8.*

Alternative 2: Proposed Action

- Project 1 (Timber Harvest and Associated Silvicultural Treatments)
  The proposed action would have no adverse effects on species composition and structural diversity of plant communities in riparian areas and wetlands due to implementing BMPs and additional design features in upland treatments, design features in Riparian Reserve treatments (including no treatment buffers), and the retention of full leave Riparian Reserves in most areas. The treatments would help to restore some structural diversity currently lacking on these sites. *Does not retard or prevent the attainment of ACS Objective 8.]*
- Project 2 (Helens Lake Shore Area and Goat Mountain OHV Trail Restoration)
  The project would have no adverse effects on thermal regulation, nutrient filtering, or erosion processes within riparian zones or wetlands due to the small scope of the treatments, and because no materials would be removed from the sites treated. The treatments would help to restore some structural diversity currently lacking on these sites. *Does not retard or prevent the attainment of ACS Objective 8.*

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

Alternative 1: No Action

The No Action alternative would result in the continued development at the current rate with no known effect on the dependent species. *Does not retard or prevent the attainment of ACS Objective 9.*

Alternative 2: Proposed Action

- Project 1 (Timber Harvest and Associated Silvicultural Treatments)
  The proposed action would have no adverse effect on riparian dependent species. Although thinning activities may affect invertebrates within the treatment areas, adjacent non-thinned areas should provide adequate refugia for the species. In the long term, the treatments would restore elements of structural diversity to the portions of Riparian Reserves selected for treatment. These attributes would help to provide resources currently lacking or of low quality, and over the long-term, would benefit both aquatic and terrestrial species. *Does not retard or prevent the attainment of ACS Objective 9.*
- Project 2 (Helens Lake Shore Area and Goat Mountain OHV Trail Restoration)
  The project is designed to restore damaged habitat and would benefit both aquatic and terrestrial species. *Does not retard or prevent the attainment of ACS Objective 9.*

7.3 Appendix 3 – Response to Scoping Comments

A scoping letter was sent on September 30, 2003 to federal, state and municipal government agencies, nearby landowners, tribal authorities, and interested parties on the Cascades Resource Area mailing list. The letter briefly described the current version of the Hillock Projects and included maps (previous versions with the same name were in the same general area, but entirely different stands).

One letter with scoping comments was received from Gradey Proctor on May 13, 2003, prior to the scoping letter. Two letters were received in response to the scoping letter: BARK and Karen Sjogren.

Summary of comments and BLM responses:

7.3.1 Gradey Proctor:

Concern: pockets of late successional/old growth forests in the area, especially near William's Lake and the beaver pond near William's Lake in "Section 24". **Response:** The concern expressed about older forests is apparently based on earlier versions of the proposal that did include harvest of late successional stands. The current version is thinning only, in young stands. William's Lake is in section 26 and there are no proposed harvest units within a mile of the lake in the current version of the projects.

Concern: water quality, especially in light of cumulative effects when combined with other activities in the area. **Response:** All proposed harvest is thinning, which does not contribute measurably to water quality problems when done with the Best Management Practices and additional design features incorporated into the plan. The Interdisciplinary Team (IDT) of resource specialists that developed the proposal included a BLM Hydrologist, a Fisheries Biologist, and a representative from the South Fork Water Board. The effects to water quality are described in EA section 2.4.3.1.

Concern: lynx and other species, asked whether surveys are planned. **Response:** All required surveys have been done and documented in the file.

Question: Roads to be built, high road density. **Response:** Only two new roads are planned, one is a short extension of an existing road, the other road (approx. 1,000 ft.) would provide for skyline logging in an area previously tractor logged. Both of these roads, as well as several other currently unused roads to be renovated, would be closed and stabilized or decommissioned after use.

7.3.2 Karen Sjogren:

Supports Project 2, restoration. **Response:** Thank you.

Does not generally support riparian treatments, but may be acceptable if riparian area is not disturbed, and stands are young and dense. **Response:** The riparian area is a physical and biological designation, while Riparian Reserve is a land use allocation, a legal designation. No activities are proposed in the riparian area, only within the Riparian Reserve outside of the biological/physical riparian area. Also, the stands are the same age (55-65 years old) as the rest of the stands being treated and are dense. No trees as old as 80 years are in the stands to be treated.

States that no additional roads should be built, road density is already too high. Also, even existing roads are not adequately funded for maintenance. Use of existing maintained roads is OK with appropriate restrictions. Blocking and stabilizing is also a good idea, generally. **Response:** New roads, and roads to be re-opened, are limited to the minimum amount necessary to operate according to the plan developed by the IDT. All of these roads would be decommissioned or stabilized and closed after operations. Small areas and other marginal areas that would have required additional roads are being dropped from the potential thinning area. Maintenance and design features to prevent water quality problems are incorporated in the project. See also, response above.

Fuels treatments should focus on thinning young stands. **Response:** The entire timber sale proposed action (Project 1) is thinning young stands. Fuels treatments are limited to reducing potential for fires starting in logging slash and becoming wildfires.

7.3.3 BARK:

Signed by Gradey Proctor and Sandi Scheinberg

Concern: may be old growth in the project plan. **Response:** No old growth, or mature, stands are included in the proposed action.

Conserve diversity in thinning. **Response:** Prescription calls for maintaining species mix.

Reduce source of future CWD, snags and humus. **Response:** Potential for numerous small snags and debris would be reduced by the proposed activity, but the potential for developing large diameter snags and CWD in the future would be accelerated. The sources for humus are expected to be adequate, even with removal of tree boles by thinning.

Concerns: South Fork Clackamas is in "terrible shape." Enumdrated specific problems, including deep slash, soil loss from clearcuts, and lack of vegetative buffer. Recommend restoration along South Fork. **Response:** BARK's assessment of the health of the stream on BLM managed land differs from BLM Hydrologist and Fisheries Biologist assessments which found the stream channel to be in "proper functioning condition". It is recognized that adjacent slopes, in many cases down to the channel banks, have been treated in ways that would no longer be done and that earth movement has occurred. Riparian Reserve treatments are designed as part of a long range restoration process.

Concern: Cumulative effects, especially pertaining to water quality. Need analysis of how increases in peak flows would affect each stream. Analysis should consider potential impact to community water supplies. Use of skid trails may disrupt drainage and potentially create mass wasting. **Response:** Analysis included modeling as well as observations and data resulting from past thinning harvests in the area. No measurable degradation of water quality or negative effects to stream channel function has been observed in past thinning operations, nor is any anticipated from the proposed action. No measurable disruption of drainage or increased potential for mass wasting are anticipated with the design features and BMP to be followed. The IDT representative from the South Fork Water Board concurs with this analysis and conclusion.

Concern: Loss of existing old growth stands. **Response:** No mature or old growth stands are included in the proposed action.

Concern: Snags. Preserve all existing snags. Created snags do not provide same benefit as natural snags. **Response:** There are very few, if any, larger diameter snags (20"+ diameter) in the project area. Any found would be protected. The EA addresses loss of small diameter snags. Snag creation is not planned as part of the project. Thinning is anticipated to accelerate diameter growth compared to not thinning, so larger trees to provide for future large snags would be grown more quickly than without treatment.

Concern: Roads. Road density, condition, maintenance, decommissioning, and closing. Restoration of OHV roads. **Response:** These concerns were considered in depth by the IDT and are discussed in the EA. In short: Road density is high and the proposed action minimizes open road density in consideration of current and future management objectives. Project 2 implements restoration of OHV trails. The beaver pond is outside of the proposed project area and would not be affected by these projects. Additional notes: BARK uses USFS road numbering, which does not cross reference well in many cases with BLM road numbering, especially on BLM managed lands. Also, several of the roads described are apparently outside of the proposed project area.

Concern: Surveys should be done for many species. Environmental baselines and cumulative impacts analysis should be done for wildlife and their habitat. **Response:** All required surveys and analyses have been done. Results are documented in the files.

Concern: Windthrow. **Response:** Avoiding problems with windthrow was considered in developing the silvicultural prescription. Stands similar to the one described in the concern are not a part of the proposed action.

Concern: Sedimentation. Sediment generated at junction of 4510 and 150 spur. Clearcuts along the South Fork. Steep stream adjacent slopes, especially units 26A&B. Need quantification of sediment. Encourage road closures.

Response: Prevention of additional sedimentation was carefully considered in development of the proposed action design features including: unit design, logging system design, road use and maintenance, and Project 2. The combination of design features and BMP is anticipated to prevent any measurable increases in sedimentation. None of the proposed actions are "clearcuts" and none include operations within 50 ft. of streams, or within riparian habitat, whichever is wider. Units 26A&B have been dropped from the proposed action. There are currently no sediment monitoring stations in the area, but observations and data from monitoring previous, similar operations in the watershed have not shown increases in sediment production. Road closures are planned as part of the projects.

Concern Cumulative Effects. Consider effects of this action combined with five other sales planned in the South Fork Watershed. Specifically mentioned habitat. Encourages post monitoring and mitigation be included in economic analysis and environmental analysis.
Response: Cumulative effects were assessed. "Mitigation" is not separated from design features. Monitoring would be done according to BLM policy.

Concern: Fire Risk. Risk of ignition and severity increases after thinning. Risk increased by recreational use. Nearby communities at risk in case of catastrophic fire. **Response**: Risk would be mitigated by fuel reduction near open roads and by access control along other roads. Assessment of fuel types and available resources indicates that control would be feasible in all but extreme conditions. Extreme conditions may occur regardless of this activity.

Conclusion: Prepare an EIS. **Response:** Assessment indicates that a FONSI is appropriate and an EIS is not needed.