

# ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT

## Turnridge Projects

Environmental Assessment Number OR-080-03-02

28 November 2002

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

Responsible Agency: USDI - Bureau of Land Management

Responsible Official: Brad Keller, Field Manager  
Cascades Resource Area  
1717 Fabry Road SE  
Salem, OR 97306  
(503) 375-5646

For further information, contact: Keith Walton, Project Leader  
Cascades Resource Area  
1717 Fabry Road SE  
Salem, OR 97306  
(503) 375-5676

**Abstract:** Five preliminary alternatives were evaluated for timber harvest and watershed restoration activities on federal lands located in Sections 1, 3, 5, 11 and 17 of Township 10 South, Range 3 East, Willamette Meridian; and within the Turnridge Creek, Mad Creek, Rock Creek and Snake Creek drainages of the Middle North Santiam River watershed. The proposed action includes partial cut harvest of mature timber, commercial thinning of immature timber stands, regeneration harvest of mature timber, road construction and decommissioning, and riparian reserve treatments without wood removal.

# Table of Contents

A.	Introduction.....	4
B.	Finding of No Significant Impact.....	4
EA Chapter I	- PROJECT SCOPE .....	8
A.	Project Location.....	8
B.	Purpose of and Need for Action .....	8
1.	Matrix Land Use Allocation - GFMA .....	8
2.	Matrix Land Use Allocation – Connectivity/Diversity Block.....	9
3.	Riparian Reserve Land Use Allocation.....	10
4.	All Land Use Allocations .....	10
5.	Conclusion.....	10
C.	Proposed Action .....	10
1.	Project 1 – Timber Management.....	10
2.	Project 2 – Riparian Reserve Treatment.....	11
D.	Decision to be Made.....	11
E.	Issues.....	11
1.	Project 1 – Timber Management.....	12
2.	Project 2 - Riparian Reserve Treatment.....	13
EA Chapter II	- ALTERNATIVES, INCLUDING THE PROPOSED ACTIONS .....	13
A.	No Action Alternative.....	13
B.	Projects.....	13
1.	Project 1 - Timber Management (TM).....	13
2.	Project 2 – Riparian Reserve Treatment (RR) (ACS Objective 8) .....	17
C.	Design Features and Mitigation Measures.....	17
1.	Project 1 – Timber Management.....	17
2.	Project 2 – Riparian Reserve Treatment (RR).....	25
D.	Alternatives Dropped from Detailed Analysis .....	25
1.	Project 1 – Timber Management.....	25
2.	Project 3 – Fish Passage Improvement.....	27
EA Chapter III	- AFFECTED ENVIRONMENT.....	28
A.	Environment Affected by Project 1 - Timber Management Alternatives A and B .....	28
1.	Soil .....	28
2.	Hydrology and Water Quality .....	28
3.	Vegetation.....	29
4.	Wildlife .....	31
5.	Fire and Fuels .....	35
6.	Visual, Recreation, and Rural Interface Resources.....	36
7.	Other Resources .....	36
B.	Environment Affected by Project 2 – Riparian Reserve Treatment.....	37
EA Chapter IV	- ENVIRONMENTAL EFFECTS .....	38
A.	Effects of the No Action Alternative .....	38
B.	Effects of Project 1, Timber Management.....	39
1.	Soils.....	39
2.	Hydrology and Water Quality .....	40

3.	Vegetation.....	44
4.	Wildlife .....	45
5.	Fire and Fuels .....	49
6.	Visual, Recreation and Rural Interface Resources.....	50
C.	Effects of Project 2, Riparian Reserve Treatment.....	51
1.	Soils.....	51
2.	Hydrology and Water Quality .....	51
3.	Vegetation.....	51
4.	Aquatic Conservation Strategy Objectives.....	51
5.	Wildlife .....	51
6.	Visual, Recreation and Rural Interface Resources.....	52
D.	Conformance With Land Use Plans, Policies, and Programs.....	52
	EA Chapter V - CONSULTATION .....	53
	EA Chapter VI - List of Preparers .....	55
	EA Chapter VII - APPENDICES .....	56
A.	Appendix A - Elements of the environment.....	56
B.	Appendix B – Aquatic conservation Strategy (ACS) Objectives.....	60
C.	Appendix C – Glossary .....	64
D.	.....	64
D.	Appendix D - Public Comments Summary .....	66
E.	Appendix E – Maps.....	67

# FINDING OF NO SIGNIFICANT IMPACT

## A. INTRODUCTION

The Bureau of Land Management (BLM) has conducted an environmental analysis (Environmental Assessment Number OR-080-03-02) for a proposal to harvest timber within the Middle North Santiam River watershed in Linn County. This project would occur within Township 10 South, Range 3 East, Sections 1, 3, 5 and 11, Willamette Meridian. The project is within *Matrix and Riparian Reserve* land use allocations. The environmental assessment (EA) is attached to and incorporated by reference in this Finding of No Significant Impact (FONSI) determination.

Implementation of the project would conform to management actions and direction contained in the Salem District Record of Decision and Resource Management Plan (RMP). The RMP, dated May 1995, is tiered to and incorporates the analysis contained in the *Salem District Proposed Resource Management Plan/Final Environmental Impact Statement (RMP/FEIS)* (September 1994). The proposed action and associated alternatives also conform with direction described in the attached EA.

The EA and FONSI will be made available for public review from November 27, 2002 to January 3, 2003. The notice for public comment will be published in a legal notice by the Stayton Mail, a local newspaper of general circulation; sent to those individuals, organizations, and agencies that have requested to be involved in the environmental planning and decision making processes; and posted on the Internet at <http://www.or.blm.gov/salem/html/planning/index.htm>. Comments received in the Cascades Resource Area Office, 1717 Fabry Road SE, Salem, Oregon 97306, on or before January 03, 2003 at 4:00 P.M., Pacific Time, will be considered in making the final decisions for this project. Office hours are Monday through Friday, 7:30 A.M. to 4:00 P.M., closed on holidays.

## B. FINDING OF NO SIGNIFICANT IMPACT

Based upon review of the EA and supporting documents, I have determined that the project is not a major federal action and will 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 and do not exceed those effects described in the *RMP/FEIS*. Therefore, an environmental impact statement is not needed. This finding is based on the following discussion:

Context. The project is a site-specific action directly involving approximately 187 acres of BLM administered land that by itself does not have international, national, region-wide, or state-wide importance.

Intensity. The following discussion is organized around the Ten Significance Criteria described in 40 CFR 1508.27.

1. **Impacts may be both beneficial and adverse.** Harvested timber would support local mills and the overall economy of the area. In thinning areas, remaining trees would receive more light, water and nutrients and would grow to larger sized trees more rapidly, contributing to structural diversity. Harvest of regeneration harvest units and partial cut units would alter the characteristics of wildlife habitat. One temporary road would be constructed. The new road would be decommissioned, resulting in no change in road mileage. Riparian reserve treatments without wood removal would increase structural diversity. Short term, local increases in stream turbidity would occur during road construction and hauling (e.g., would only occur during and immediately after construction and/or hauling and is not likely to be visible or measurable downstream from the project area. None of the environmental effects disclosed above and discussed in detail in Chapter 4 of the EA and associated appendices are considered significant, nor do the effects exceed those described in the *RMP/FEIS*.
2. **The degree to which the selected alternative will affect public health or safety.** Public health and safety were not identified as an issue. The project is comparable to other timber management and riparian treatment projects that have occurred within the Salem District with no unusual health or safety concerns.
3. **Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farm lands, wetlands, wild and scenic rivers, or ecologically critical areas.** There are no historic or cultural resources, park lands, prime farm lands, wild and scenic rivers, or wildernesses located within the project area (EA Appendix A).
4. **The degree to which the effects on the quality of the human environment are likely to be highly controversial.** Extensive scoping of the project resulted in approximately 86 comment letters. In addition, a representative of the City of Salem Water Department participated in planning meetings and field reviews. In response to some of the letters and the City of Salem's concerns, an alternative featuring no regeneration harvest was developed (TM Alternative B).

The effects of the project on the quality of the human environment were adequately understood by the interdisciplinary team to provide an environmental analysis. A complete disclosure of the predicted effects of the project is contained in Chapter 4 of the EA and associated appendices.

5. **The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.** The project is not unique or unusual. The BLM has experience implementing similar actions in similar areas. The environmental effects to the human environment are fully analyzed in the EA. There are no predicted effects on the human environment that are considered to be highly uncertain or involve unique or unknown risks.

6. **The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.**  
The project does not set a precedent for future actions that may have significant effects, nor does it represent a decision in principle about a future consideration. The project presented is typical of previous actions and is completely consistent with established practices fully analyzed within the RMP. Any future projects will be evaluated through the National Environmental Policy Act (NEPA) process and will stand on their own as to environmental effects.
7. **Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.** The interdisciplinary team evaluated the possible actions in context of past, present and reasonably foreseeable actions. Significant cumulative effects are not predicted. A complete disclosure of the effects of the project is contained in Chapter 4 of the EA.
8. **The degree to which the action may adversely affect districts, sites, highways, structures, or other objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.** The project will not adversely affect districts, sites, highways, structures, or other objects listed in or eligible for listing in the National Register of Historic Places, nor will it cause loss or destruction of significant scientific, cultural, or historical resources (EA, Appendix A).
9. **The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.**

**ESA Consultation:** Section 7 Consultation with the United States Fish and Wildlife Service (USFWS) is in progress. The Turnridge projects were submitted on September 3, 2002 as part of the Biological Assessment (BA) addressing fiscal year 2003-2004 habitat modification projects within the Willamette Province. A final Biological Opinion is still pending on this consultation. The northern spotted owl has been observed in the vicinity. No other threatened or endangered plants or animals were observed in the area. This project “may affect, likely to adversely affect” the spotted owl, according to the criteria described in the BA (p.33-36). The proposed timber harvest area is not located in Critical Habitat for the spotted owl. The design features of the projects specify that there would be a seasonal restriction during the critical nesting season from March 1 – July 15. All applicable terms and conditions from the anticipated Biological Opinion (BO) would be incorporated into the project design features. A final decision on this action would not be made until the BO is received.

**Fish:** ESA Section 7 Consultation: Consultation with NOAA Fisheries for this proposed project is in progress. A draft Biological Assessment will be reviewed by the Willamette Province Level I Team in accordance with the Streamlined Consultation process.

The effect determination for ESA listed fish is "may affect, not likely to adversely affect" Upper Willamette River chinook salmon and steelhead trout. A final decision on this action would not be made until a letter of concurrence is received.

10. **Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.** The project does not violate any known Federal, State, or local law or requirement imposed for the protection of the environment. State, local, and tribal interests were given the opportunity to participate in the environmental analysis process. Furthermore, the project is consistent with applicable land management plans, policies, and programs.

Prepared By: *Keith Walton* 11/26/02  
Keith Walton, IDT Leader Date

Reviewed By: *Carolyn Sands* 11/26/02  
Carolyn Sands, NEPA Coordinator Date

Approved By: *Brad Keller* Nov 26 '02  
Brad Keller Date  
Cascades Resource Field Manager  
*Acting*

# EA CHAPTER I - PROJECT SCOPE

All numbers (e.g., acres, road lengths and volumes) are estimates based on GIS mapping and office analysis. Final numbers, determined during field work, will vary from these estimates. This variance is not expected to result in a change in effects analyzed in this document.

## A. PROJECT LOCATION

The project is located approximately five miles south of Gates, Oregon, in Linn County, Sections 1, 3, 5 and 11, Township 10 South, Range 3 East, Willamette Meridian (WM). The project is on forested land managed by the Cascades Resource Area, Salem District, Bureau of Land Management (BLM). The project area lies within the Turnridge Creek, Mad Creek, Rock Creek and Snake Creek drainages of the Middle North Santiam River watershed.

The proposed project is located within both the General Forest Management Area (GFMA) and Connectivity portions of the Matrix, and in the Riparian Reserve (RR) land use allocations (LUA), as identified within the *Salem District Record of Decision and Resource Management Plan* (RMP) dated May 1995. The Middle North Santiam River Watershed is not a Key Watershed (RMP p. 6). This watershed is part of the municipal watershed for the City of Salem, Oregon.

## B. PURPOSE OF AND NEED FOR ACTION

### 1. *Matrix Land Use Allocation - GFMA*

#### a) **Timber Management**

The purpose of this project would be to contribute to both the immediate and long-term sustainable supply of timber and other forest products, which would contribute to local and State economic diversity, as described in the Resource Management Plan (RMP) pages 20 and 46-48 while maintaining future forest management options and protecting other resource values.

Stands which have reached Culmination of Mean Annual Increment (CMAI) (or are close to reaching it, typically between 70 and 110 years of age) are scheduled for regeneration harvest to produce maximum average annual growth over the lifetime of the timber stand and develop a desired age class distribution across the landscape (RMP p. 48). These stands could also be partial cut to provide some level of immediate timber harvest, retain options for future stand management, and maintain canopy cover to provide for other resource values (IDT, 03 June 2002).

Suitable managed timber stands may be commercially thinned to provide immediate timber harvest and to increase timber production or to achieve other management objectives (RMP p. 48).

### **b) Development of Multiple Stand Characteristics**

In order to retain future management options on a landscape level, timber harvest and related management practices would be designed to maintain a variety of stand age and size classes in the vicinity, provide for windfirm forest stands at densities that allow timber stand growth at or near what the site is capable of supporting, be resistant to insects, diseases and wildfires, protect water quality, and provide elements of complex stand structure such as snags, down logs and green tree retention areas.

### **c) Roads**

Roads are to be managed to provide an adequate transportation system to manage timber resources and serve other management needs on federal, State and private lands in a safe and environmentally sound manner. Arterial and major collector roads would be maintained, renovated or improved to meet current safety and Best Management Practices standards to form the backbone of the transportation system in the planning area. Problems associated with high road density or existing road and drainage features that pose a substantial risk to meeting Aquatic Conservation Strategy objectives would be reduced by allowing unused roads to re-vegetate, and modifying roads or drainage features on roads to restore stable drainage patterns where needed. (RMP pp. 11, 62)

## ***2. Matrix Land Use Allocation – Connectivity/Diversity Block***

### **a) Timber Management**

The purpose of and need for action in Connectivity is essentially the same as in GFMA, except that 25 to 30 percent of each connectivity block is to be maintained in late-successional forest at any point in time, and regeneration harvests are to be scheduled on a 150-year rotation, and more green trees (12-18) are retained when regeneration harvest occurs (RMP pp. 21, 48).

### **b) Development of Multiple Stand Characteristics**

Forest management practices would be modified to recover old-growth conditions in approximately 100 to 120 years (stand age) to provide for connectivity habitat between Late-Successional Reserves and to maintain ecologically valuable structural components such as down logs, snags, broken top trees, large trees, diverse tree and understory species, and variable stand densities (RMP pp. 21, 48).

### **c) Roads**

The purpose and need for action in the Connectivity/Diversity Block are the same as in the GFMA.

### ***3. Riparian Reserve Land Use Allocation***

The purpose of any management activities in the Riparian Reserve is to meet ACS objectives and provide habitat for terrestrial species.

### ***4. All Land Use Allocations***

Fish Habitat: Maintaining or enhancing the fisheries potential of streams is consistent with BLM and nationwide initiatives and plans and with attaining ACS objectives. Improving fish passage is one of the measures identified in BLM's Management Actions/Direction to accomplish this. (RMP p. 27)

### ***5. Conclusion***

In summary, the purpose and need for this project is to:

- Contribute toward District timber management goals and local economic diversity.
- Manage these timber stands for a sustainable supply of timber and other forest commodities for future harvest and other management options.
- Manage the roads in the area to meet transportation needs and ACS objectives.
- Increase stand diversity in portions of the Riparian Reserve.
- Improve fish passage.

## **C. PROPOSED ACTION**

### ***1. Project 1 – Timber Management***

The proposed action (TM Alternative A) includes regeneration harvest of approximately 81 acres, commercial thinning of approximately 14 acres, partial cut harvest of approximately 90 acres, salvage of approximately 2 acres of windthrow, creation of snag and coarse woody debris, road construction, road maintenance and renovation, and decommissioning the road to be constructed.

## 2. *Project 2 – Riparian Reserve Treatment*

### a) **Stand Structure Creation in Riparian Reserves (ACS objective #8)**

- Cut or girdle some trees around selected conifers so that they can develop into open grown wolf trees rather than having a dense, uniform stand of conifers with clean boles.
- Base or top girdle trees to create snags.
- Accomplish this with multiple treatments spread out over the next few years to introduce change at a rate appropriate to each site.

### b) **Allow for future development and implementation of similar projects without wood removal.**

- As additional field work is done in the vicinity, more sites where Riparian Reserve treatments similar to those described in Chapter III would be identified.
- As additional funds and other resources become available, these treatments would be implemented.

## **D. DECISION TO BE MADE**

The Cascades Field Manager will decide whether or not to prepare an environmental impact statement, and which, if any, of the projects and alternatives put forward here to implement.

## **E. ISSUES**

In compliance with NEPA, the project first appeared in the September 2001 edition of the quarterly *Salem District Project Update*, and in editions since then, which were mailed to over 1,000 addresses. Also, a *scoping* letter was mailed on May 25, 2001 to 21 potentially affected and/or interested individuals, groups, and agencies. A total of 81 letters were received as a result of this scoping as of November 20, 2002 when this is being written. (In this context, “letters” includes letters, cards, petitions, e-mails and any other correspondence received by the BLM.) In addition, a representative of the City of Salem Water Department participated in planning meetings and field reviews during the environmental analysis. The cards, letters and other communications are available for inspection in the project development file at the Salem District office. Table 10 in Appendix D shows a tabular summary of the types and numbers of comments in these letters.

Members of the public who responded to the BLM as a result of this scoping raised the following issues.

## ***1. Project 1 – Timber Management***

### **a) Issue 1. Water Quality and City of Salem Water**

Approximately 29 letters expressed concerns about adverse effects of commercial harvest and road construction on water quality.

Design features and mitigation measures to protect water quality are incorporated into both action alternatives and are described in Chapter II.

TM Alternative B was developed to retain more vegetation cover in harvest units containing mature trees to further reduce potential adverse effects on water as compared to the design features and mitigation measures incorporated into Alternative A, the Proposed Action. The City of Salem Water Department supports TM Alternative B.

A “Restoration Only Alternative” was suggested in some of the letters received. Project 2 is a restoration project covered in this EA. A full “Restoration Only” action alternative with no timber harvest would not meet the Purpose of and Need for Action (see section I.B. of this EA) and was not analyzed.

### **b) Issue 2. Social Factors - Visual, Rural/Urban Interface, Aesthetic Values**

Approximately 27 letters expressed concerns about adverse effects to aesthetic, educational, spiritual and related values.

The public sentiment expressed in the letters that addressed this issue essentially expressed opposition to the Objectives and the Management Actions/Direction for Matrix land which are described in the RMP, pages 20 and 21. Many of the letters requested dropping timber harvest or only partial cut harvest in stands less than 80 years old, which is the No Action Alternative for Project 1 – Timber Management in this EA. Some letters recommended development of recreational or educational programs, which are outside the scope of the Purpose of and Need for Action.

### **c) Issue 3. Late-Successional Forest/Old-Growth Management and Habitat**

Approximately 73 letters expressed concerns about adverse effects to late-successional forests and old-growth trees, and the habitats associated with them. The RMP identifies late-successional and old-growth forest habitat characteristics as a management concern, especially in Connectivity/Diversity block lands in the Matrix. (RMP pp. 21, 22, 46-48)

Stands with a major old-growth component were dropped from the initial proposal for a variety of reasons as described in the Alternatives Dropped from Detailed Analysis section of Chapter II. Scattered old-growth trees within proposed harvest units would be protected as described in the Design Features and Mitigation Measures section of Chapter II.

### **d) Issue 4: Red Tree Voles and other wildlife species and habitat**

Approximately 21 letters expressed concerns about adverse effects to named animal species, most commonly red tree voles. None of the harvest units in the proposed action includes area within the required buffers for red tree voles or other Survey and Manage Species. Several potential harvest units that affected these buffers were dropped or modified to exclude the buffers. Effects of timber harvest on late-successional species are described in Chapter IV.

**e) Issue 5: Alternative with no new roads**

Approximately 18 letters requested that there be no new road construction. This issue is addressed in Chapter II and the effects of road construction are described in Chapter IV.

## **2. Project 2 - Riparian Reserve Treatment**

This project was added to the EA after the scoping process. No issues associated with this project were raised during the planning process; therefore only the “proposed action” and “no action” alternatives for Project 2 are developed in this EA.

# **EA CHAPTER II - ALTERNATIVES, INCLUDING THE PROPOSED ACTIONS**

The required No Action Alternative, two Timber Management Project Alternatives, and a Riparian Reserve Treatment Project presented in this section are analyzed in Chapters III and IV of this EA.

## **A. NO ACTION ALTERNATIVE**

The BLM would not implement any of the Turnridge projects at this time. The local plant and animal communities would be dependent on and respond to ecological processes that would continue to occur based on the existing condition. This alternative serves to set the environmental baseline for comparing effects of the action alternatives.

## **B. PROJECTS**

### **1. Project 1 - Timber Management (TM)**

#### **a) TM Alternative A – The Proposed Action**

##### **1) Within sections 1, 3 and 11 in the GFMA Matrix LUA:**

- 63 acres of regeneration harvest in units D-6.1, D-6.2, D-8.1, D-8.2, and A-1.
- 14 acres of commercial thinning in units D-1 and D-8.1.

- Two acres of windthrow salvage in Unit D-1.
- 86 acres of partial cut in units B-1 and B-2.

2) Within section 5 in the Connectivity/Diversity Block LUA:

- 18 acres of regeneration harvest in unit C-2.
- Four acres of partial cut in unit C-4.

3) Connected Actions:

- Construct and decommission 1,000 feet of new temporary road construction in unit B-1 to allow uphill cable yarding on slopes steeper than 35 percent.
- Maintenance and renovation of BLM roads used, consisting of roadside brushing, blading the road surface, spot rocking and ditch and culvert maintenance to maintain roads to the standards described in the transportation management objectives and Best Management Practices in the RMP. These standards are designed to provide for safety, reduce the potential for sediment entering streams from the roads, and facilitate timber harvest.
- Update drainage systems maintenance (culverts, ditches, water bars, etc.) to current 100 year storm event standards.

**b) TM Alternative B**

1) Within sections 1, 3 and 11 in the GFMA Matrix LUA:

- 136 acres of partial cut in units D-6.1, D-6.2, D-8.1, D-8.2, B-1 and B-2.
- 14 acres of commercial thinning in units D-1 and D-8.1.
- Two acres of windthrow salvage in Unit D-1.

2) Within section 5 in the Connectivity/Diversity Block LUA:

- 18 acres of partial cut in unit C-2.
- Four acres of partial cut in unit C-4.

3) Connected Actions:

- See TM Alternative A.

c) **Table 1. Summary and Comparison Table for the Two Timber Management Alternatives**

Unit No.	EA Acres	Mapped Stand Type	Mapped Stand Age	TM Alternative A Regeneration and Partial Cut Harvest	TM Alternative B Partial Cut Harvest Only
<b>T. 10 S., R. 3 E., Sec. 1</b>					
D-1	7	D3=1920	80	Com. Thin (CT)	Com. Thin (CT)
	2	D4H4-/D3=1900	100 with scattered OG	Salvage windthrow	Salvage windthrow
D-6.1	19	D3=1900 (CT 1968)	100	Regen	Partial Cut
D-6.2	23	D3=1900 & RA (CT 1974)	100	Regen	Partial cut
D-8.1	7	D3=1920	80	CT younger type	CT younger type
	4	D3=1900	100	Regen older type	Partial cut older type
D-8.2	4	D3=1900	100	Regen	Partial cut
<b>T. 10 S., R. 3 E., Sec. 3</b>					
A-1	13	D3=1920 (CT 1971)	80	Regen	No Harvest
<b>T. 10 S., R. 3 E., Sec. 5    Connectivity</b>					
C-2	18	D4H4-1800/ D3=1920 (CT 1980)	80 with scattered OG	Regen	Partial Cut/Density Mgt.
C-4	4	D3=1920 & D3=BLM-1940	80	Partial Cut	Partial Cut
<b>T. 10 S., R. 3 E., Sec. 11</b>					
B-1	43	D3=1920 Multiple types, (CT 1973)	80 with scattered other types	Partial Cut	Partial Cut
B-2	43	D3=1920 Multiple types, (CT 1973)	80 with scattered other types	Partial Cut	Partial Cut

**Table 2. Comparison of Alternatives for Selected Parameters**

PARAMETERS			ALTERNATIVES				
			No Action	Alternative A (Proposed Action) Regeneration and Partial Cut of Mature Timber		Alternative B Partial Cut only of Mature Timber	
Acres Treated (approximate)	Matrix	Regeneration Acres	0	Units	Acres	Units	Acres
			0	D-6.1, D-6.2, D-8.1(portion), D-8.2, A-1, C-2	81	0	
		Partial Cut Acres	0	C-4, B-1, B-2	90	D-6.1, D-6.2, D-8.1(portion), D-8.2, B-1, B-2, C-2, C-4	158
		Salvage	0	D-1 (portion)	2	D-1 (portion)	2
	Commercial Thinning Acres	0	D-1 (portion) D-8.1(portion)	14	D-1 (portion) D-8.1(portion)	14	
Total Acres Treated		0	187		174		
Approximate Green Trees per Acre after treatment	Regeneration (Alternative A) or Partial Cut (Alternative B): Units D-6.1, D-6.2, D-8.1(portion), D-8.2, A-1, C-2		50 - 110	10 – 12 (18-20 for unit C-2)		30-50	
	Partial Cut (Alternatives A & B): Units C-4, B-1, B-2		50 - 110	40-50		40-60	
	Commercial Thinning		345	140		140	
Canopy Closure	Regeneration (Alternative A) or Partial Cut (Alternative B)		55-70%	Less than 10%		30 - 40%	
	Commercial Thinning		75 - 90%	40 - 50%		40 - 50%	
	Salvage		30-50%	30-50%		30-50%	
Estimated Harvest Volume (MBF - thousand board feet)			0	4,225		1,951	
Construction (feet) would be decommissioned after operations			0	1,000		1,000	

## **2. *Project 2 – Riparian Reserve Treatment (RR) (ACS Objective 8)***

### **a) RR No Action**

No treatments for habitat restoration would be done within Riparian Reserves.

### **b) RR Proposed Action**

Habitat restoration treatments without wood removal would be done within the Riparian Reserve throughout BLM ownership in the sections containing the proposed timber management project as listed in TM Alternative A. Project elements include creating wolf trees (open grown conifer, usually Douglas-fir, with large limbs and a large crown) by cutting or girdling smaller trees around the selected wolf tree, and creating up to four snags per acre from green conifer trees larger than 20 inches in diameter by base girdling or top girdling. Treatments would be designed to avoid soil disturbance or increasing water temperature from loss of tree shade. No wood would be removed from the site. Treatments would be done in multiple entries over the next several years as site conditions are appropriate and as time and money are available.

## **C. DESIGN FEATURES AND MITIGATION MEASURES**

### **1. *Project 1 – Timber Management***

#### **a) Soil**

Design features and mitigation measures for soil are implemented to retain the productive capacity of the soil by keeping it in place, keeping compaction within limits analyzed in the FEIS, and keeping an appropriate amount of organic matter in place for nutrient cycling.

##### **1) Roads**

- Road and landing construction, maintenance and use requirements would be designed to keep soil compaction and disturbance within the minimum surface area needed for safe operations.
- Approximately 1,000 feet of temporary road would be constructed, as part of this timber sale. It would be decommissioned following timber harvest and site preparation operations. Decommissioning would include ripping compacted soils, reestablishing natural drainage patterns, out-sloping the road surface so that water drains quickly to stable slopes, blocking access, and/or scattering woody debris on the disturbed soil.
- Road construction and decommissioning operations and use of natural surface roads would be limited to dry soil conditions to minimize surface runoff and potential soil erosion.
- Newly disturbed soil associated with road and landing construction and decommissioning would be seeded (with a locally adapted mix of native species seed) to stabilize the soil and prevent erosion.
- Waterbars would be constructed as needed to minimize surface runoff and potential soil erosion.

- Damaged, deteriorated and under-sized culverts would be replaced, and new culverts installed, as needed to meet current 100 year storm event standards to prevent road failure and sedimentation of streams.

## 2) Tractor Skidding/Ground Based Logging Equipment

- Tractor skidding roads and other ground based logging equipment systems would be designed to prevent soil compaction or disturbance of more than 10 percent of the ground surface area.
- Skidding roads used in previous entries would be re-used wherever feasible to concentrate potential impacts on areas already impacted.
- Wheeled or tracked equipment would not be allowed to operate on slopes steeper than 35 percent to avoid the additional potential soil disturbance and channels for runoff which may be caused by operating this equipment on steeper slopes. Exceptions may be granted for very short pitches of steeper slopes where avoiding the slope would cause greater impacts than operating on the slope, such as where there is an existing skid road on the slope and/or a long skid road would be required to avoid a short pitch.
- Tractor/ground based equipment operations would be limited to dry soil conditions to minimize compaction, surface runoff and potential soil erosion.
- Slash and organic debris would be maintained on tractor roads as much as possible to protect soil surfaces from compaction and displacement. The amount that could be maintained would vary with the type of equipment used.
- Waterbars would be constructed on tractor roads as needed to minimize surface runoff and potential soil erosion.
- Tractor roads and landings in regeneration harvest units (TM Alternative A only) would be ripped following site preparation to break up compaction and allow improved percolation.
- All tractor roads and landings that are ripped following use would be seeded with a locally adapted mix of native species seed to stabilize the soil.

## 3) Skyline Yarding

- Skyline yarding systems would be designed to prevent soil compaction or disturbance of more than 10 percent of the ground surface area. This may be achieved by a combination of these or other techniques:
  - o Limiting the number and spacing of yarding roads by use of lateral yarding.
  - o Limiting yarding road width.
  - o Location of lift trees and tail holds to optimize log suspension, including multi-span skyline systems and locating lift or tail trees outside of harvest unit boundaries.
  - o Limiting the amount of sidehill yarding, which increases yarding road width.
- The leading ends of logs would be suspended above the ground during in-haul (one-end suspension) to reduce soil compaction and disturbance.
- Downhill and sidehill skyline yarding without full suspension would be seasonally restricted to either dry soil conditions, or when there is sufficient snow cover (six inches minimum depth anticipated, may be more depending on conditions), to minimize compaction and gouging. Very little downhill or sidehill yarding is anticipated.

- Skyline yarding on units D-6.1 & 6.2 would be restricted to the dry season (typically July 1 – October 31) to minimize soil erosion from direct rainfall on freshly disturbed soil and reduce potential post-logging soil erosion.
- Skyline corridors used in previous entries would be re-used wherever feasible.
- Retained green trees, or trees outside of the unit boundaries (including those in Riparian Reserves) may be used for attaching cables.

#### 4) Site Preparation – TM Alternative A Only

*Only units that are regeneration harvested would have site preparation treatments.*

- Unit D-6.2 would be broadcast burned if conditions and available personnel allow. Burning would be done with methods and under fuel and weather conditions that would retain most of the duff and litter layer to prevent volatilization of nutrients, maintain site productivity and protect slope stability.
- In all other units to be regeneration harvested, and in unit D-6.2 if it is not broadcast burned, slash and brush would be excavator piled under the following conditions to minimize compaction and erosion:
  - o Piling operations would be limited to dry soil conditions.
  - o Operating methods appropriate to the site conditions (for example: using skid trails, walking the machine on top of slash, single pass only, use of low ground pressure tracks) would be used to minimize compaction.
  - o The excavator would operate only where slopes are less than 35percent. On slopes greater than 35% and out of reach of the excavator arm, slash would be hand piled as necessary.
  - o The grapple head used would be designed to pick up slash with minimal soil disturbance where uprooting is not planned.
- Some large vine maple clumps would be uprooted and piled.
- Slash piles would be covered with plastic sheeting when piled, then burned after the fall rains begin when fire would not broadcast through unpiled slash.

#### **b) Hydrology and Water Quality**

Design features and mitigation measures for water quality are implemented to reduce non-point source pollution to the maximum extent practicable as required by the Federal Clean Water Act (as amended by the Water Quality Act of 1987). Design features and mitigation measures that serve to keep soil in place by minimizing compaction, runoff and erosion, also serve to keep sediment out of water and are an essential part of the plan to maintain water quality. Additional design features to maintain water quality are described in this section.

##### 1) Riparian Reserve

- The site potential tree height in the vicinity of Unit C-2 in Section 5 is 180 feet. In all other areas of the proposed action it is 200 feet.
- Riparian Reserve widths are:
  - o One site-potential tree height for non-fish bearing streams and wet areas larger than one acre.
  - o Two site-potential tree heights for fish bearing streams.

## 2) Roads

- Trap or filter sediment from water flowing in ditches before it enters streams.
  - Where practical, maintain vegetation in ditches within 200 feet above all stream crossings.
  - Where ditches have been newly constructed or cleaned, place sediment traps/filtering materials in the ditch above all stream crossings.
- Log hauling would be suspended during storm events if sediment traps/filtering were not adequate to minimize or prevent fine sediment delivery from the haul route to the stream system.
- The road to be constructed would be decommissioned as soon as possible after logging. If it is not built and decommissioned in the same operating season, erosion control measures would be implemented to prevent soil loss. These measures may include: erosion matting, drainage modification, seeding, or other appropriate techniques.
- Spur roads in the vicinity of the proposed timber harvest units would be cleaned up and stabilized, if needed, to maintain drainage and runoff patterns as needed to protect water quality. These roads may be blocked and/or waterbarred to prevent vehicles from disturbing the road surface and creating mud, and to minimize the likelihood of dumping, which could introduce contaminants into ground water and streams.

## 3) Tractor Skidding/Ground Based Logging Equipment

- Skid trail patterns would be designed to avoid concentrating runoff water flows or directing them into streams.

## 4) Skyline Yarding

- Waterbars would be installed on yarding corridors as needed to prevent excessive erosion, gulying and sedimentation.
- If lift or tail trees are required in Riparian Reserves, they would be felled or topped as necessary for safety but would not be removed to avoid disturbing soil surface in the Riparian Reserves.

## 5) Site Preparation

- If unit D-6.2 were broadcast burned, TM Alternative A only, fire would be kept out of the Riparian Reserve by fire trails, pre-wetting with water and foam, and/or other holding methods.
- Foam would not be used immediately adjacent to streams or wet areas where runoff could carry foam into the riparian/aquatic system.

## c) **Vegetation**

Design features and mitigation measures for vegetation are implemented to ensure the immediate and long-term sustainability of timber production by harvesting timber according to sound silvicultural principles, protecting the health of the residual timber stand after partial cut harvest, and effectively reforesting the site after regeneration harvest (TM Alternative A). Others are implemented to maintain or enhance complex forest stand structure, maintain elements of old

growth and late-successional forest in the vicinity of the proposed timber harvest, and minimize potential noxious weed and invasive plant infestations.

1) Residual Stand Protection, Partial Cut Harvest Units, TM Alternatives A and B

- In addition to seasonal restrictions to protect soil, water and wildlife resources, no skidding or yarding would be allowed during the spring growing season (typically May 01 to July 01) when bark and cambium are easily damaged by those operations.
- Skidding and yarding techniques designed to minimize damage to residual trees would be required. Examples of potential techniques include: pre-planned skid/yarding roads, falling to lead, rub trees, etc.

2) Leave Trees in Thinning and Partial Cut Harvest Units, TM Alternatives A and B

- Generally, the smaller and more deformed trees would be selected for harvest, leaving the largest and highest quality trees to continue growing and be available for future harvest.
- Some cull and deformed trees would be retained for structural diversity and potential wildlife habitat.

3) Late-successional Forest

- Old growth trees and many of the largest second growth would be reserved from harvest in all units under both action alternatives.
  - o They would not be felled unless essential to provide for human safety.
  - o If felled, they would be reserved as CWD.

4) Site Preparation and Reforestation of Regeneration Harvest Units, TM Alternative A Only

- After harvest, all remaining brush taller than three feet would be cut (slashed) immediately after completion of yarding, or uprooted during machine piling, to reduce brush competition with conifer seedlings and increase plantable area.
- Slash would be piled for burning on units A-1, C-2, D-6.1, D-8.1 (part of unit) and D-8.2.
- Piled slash would be burned during the rainy season to open more planting spots and reduce rodent habitat.
- Unit D-6.2 would be broadcast burned to reduce slash, set back competing vegetation, and open planting spots. If conditions (including fuel management prescription parameters and air quality management) do not allow timely broadcast burning, this unit may also be excavator piled and burned.
- A mix of conifer species indigenous to the area, primarily Douglas-fir, western hemlock and western red cedar, would be planted after site preparation. Natural regeneration of tree species would also be encouraged to ensure a diversity of species and genetic stock in the future stand.
- Competing vegetation would be managed to minimize negative effects on overall stand growth for several years after planting.

5) Noxious Weeds and Invasive Plant Species

- Prior to entering BLM lands, ground disturbing and off-road machinery would be washed so that it is free of noxious weed/invasive plants seed and plant parts.

d) **Wildlife**

1) Structure, Green Trees, Snags and Coarse Woody Debris

**Common to TM Alternatives A and B**

- Retain and protect all old growth remnant trees, and protect early decay class snags where feasible without causing hazards to human health and safety, making planned operations infeasible, or causing more adverse impacts to other resources.
  - o Design green tree retention clumps around remnant old growth trees and snags with bark.
  - o Protect from direct impingement of fire during site preparation, TM Alternative A.
- Retain existing large snags and down logs where feasible.
- Top up to four green trees per acre to reduce windthrow potential by reducing wind resistance, and to create cull trees with deformed crowns that are expected to develop desirable habitat characteristics.
- Favor minor conifer species (such as western redcedar), hardwoods (primarily big leaf maple and red alder), and cull/deformed trees for retention. This applies both to green tree retention in regeneration harvest units (Alternative A) and partial cut harvest units (Alternatives A and B).
- In partial cut harvest units B-1, B-2 and C-4, thin from below and maintain an average minimum of 40 percent canopy closure immediately after harvest to maintain spotted owl dispersal habitat.
- Retain selected cull trees that have characteristics valuable for wildlife habitat.

**Specific to Regeneration Harvest Units in TM Alternative A**

- Green trees would be retained to provide for long-range future snags and CWD, and to promote a multi-storied canopy with a large green tree component in future stands.
  - o For unit C-2 (Connectivity/Diversity Block), retain a minimum average of 12 to 18 green trees per acre.
  - o For all remaining regeneration harvest units (GFMA), retain a minimum average of 6-8 green trees per acre.
  - o For units in the GFMA, the green tree retention level would be averaged across all acres in all units.
  - o Retained green trees would have average diameters equal to or larger than the average stand diameter.
- Green trees would be retained in clumps and/or green tree retention areas, as well as scattered throughout the units.
  - o Clumps and green tree retention areas would be located to provide additional protection for resources such as Survey and Manage species, old-growth remnants, small wet areas, fragile soils, etc.

- o Clumps and green tree retention areas may also be located for operational considerations such as small areas where logging is difficult or areas sheltered from wind damage.
- o Scattered trees would be unevenly distributed across the units with densities ranging from zero (near landings) to above the average retention density.
- Retained green trees which must be felled to facilitate safe logging would be left on site as coarse woody debris, or replaced with an equal or larger size tree.
- An additional four trees per acre (average across all units) would be retained for immediate snag and CWD creation. These could be turned into snags or CWD by timber harvest or site preparation operations, and windthrow. Broadcast and pile burning would be done under fuel and weather conditions and with methods that would not create more snags out of retained green trees in the unit than this plan calls for.
- A total of at least 240 lineal feet of decay class 1 and 2 CWD at least 20 inches diameter and 20 feet long would be retained per acre of timber harvest wherever this size component is present in the timber stand. This would include CWD already present and CWD created by harvest operations and windthrow.
- All old-growth trees would be retained.
- Many of the larger second growth trees would also be retained.

## 2) Individual Wildlife Species

- **Spotted Owls:** Place seasonal restrictions on all felling, yarding, and road construction and decommissioning operations from March 1 – July 15; and March 1 – September 30 on blasting to minimize the risk of disturbance to nesting spotted owls. These seasonal restrictions could be waived early if ongoing surveys indicate no presence of spotted owls within disturbance range of the harvest units.
- **Red Tree Voles:** Known locations of red tree voles would be protected according to Management Recommendations for the Oregon Red Tree Vole dated September 27, 2000. This includes protecting a minimum ten acres reserve of contiguous habitat area with at least one site potential tree height between the nest tree and the habitat area boundary.
- **Mollusks:** Known locations of *Megomphix hemphilli* would be protected with no entry buffers as necessary to maintain microhabitat.

## e) **Fish**

- The standard Riparian Reserves of one site-potential tree height on non-fish bearing streams and two site potential tree heights on fish bearing streams would be implemented adjacent to all harvest units. No ground disturbing activities would take place within these Riparian Reserves.
- All design features to protect water quality would protect fisheries.

## f) **Fire and Fuels**

### 1) Wildfire Prevention

- Broadcast burning and excavator pile and burn operations would be used to reduce the combustible fuel loading in regeneration harvest units to minimize wildfire hazard.

- Burn plan parameters for weather and fuel conditions and protection measures (e.g. fire trails, pre-wetting, personnel and equipment on scene) would minimize the risk of escaped fire from broadcast and pile burning operations.
- 2) Retained Green Trees Protection
- Broadcast and pile burning would be done under fuel and weather conditions and with methods that would not create more snags out of retained green trees in the unit than this plan calls for.
  - In unit D-6.2, TM Alternative A:
    - o All Riparian Reserve areas and green tree retention clumps larger than one acre would be fire trailed for maximum protection from ground fire.
    - o Within a radius of 15 feet around the boles of hemlock and western redcedar trees larger than 20 inches diameter, fuel concentrations would be reduced to the level where fire intensity would be low enough to avoid damaging the cambium on these thin barked trees.
- 3) Other Resource Protection
- Broadcast burning and excavator pile and burn operations would reduce the amount of slash and debris remaining after regeneration harvest to facilitate tree planting and successful reforestation of the sites.

**g) Visual, Recreation, and Rural Interface Resources**

1) Visual Resources

- No design features are proposed specifically for visual resources.

2) Recreation

- No design features are proposed specifically for recreation.

3) Rural Interface Resources

- Log hauling would not be allowed on any Saturday, any Sunday, or weekdays which are part of the Memorial Day, July 4<sup>th</sup> and Labor Day holidays.

**h) Other**

1) Special Forest Products (SFP)

- Following harvest of commercial timber, firewood cutters would be allowed to cut and remove firewood from landing piles. Logs contributing to the 240 lineal feet of CWD per acre would be excluded from firewood cutting.
- SFP permits for entire plants would be issued for areas designated for road construction prior to the start of construction activities.
- Permits to collect above ground plant materials (fern fronds, moss, salal, mushrooms, etc.) would be issued prior to harvest activities in any area where site preparation is planned.

- Entire vine maple plants may be harvested from areas where vine maple would be uprooted during excavator piling.

## 2) Cultural Resources

- Surveys for cultural and archeological resources have not identified any sites in the proposed timber harvest units. If any sites are identified during timber harvesting, the operations would be immediately halted and the Field Manager would be notified. Operations would be resumed only with the Field Manager's approval, and only after appropriate mitigation measures were designed and implemented to provide any needed protection of those resources.

## **2. Project 2 – Riparian Reserve Treatment (RR)**

Habitat restoration treatments without wood removal would be done within the Riparian Reserve throughout BLM ownership in the sections containing the proposed timber harvest units listed in Alternative A. The following specific projects are planned at this time. Other similar projects would be added as time and funding permit.

- **Section 3 adjacent to unit A-1:** Approx. 1/6 acre. Create one Douglas-fir wolf tree (open grown with large limbs and a large crown) with an associated clump of open grown western hemlock trees by cutting or girdling approximately 21 Douglas-fir trees.
- **Section 5 adjacent to dropped unit C-5:** Two plots of approx. 1.5 acre each. Create multiple wolf trees by cutting or girdling approx. 40 Douglas-fir trees surrounding the future wolf trees.
- **Sections 1, 3, 5 and 11:** Create up to four snags per acre from green conifer trees larger than 20 inches in diameter by either base girdling or top girdling at the base of the live crown. Small clumps of 3-4 created snags would be created where understory hemlock or western redcedar would be released to grow faster. Tree selection would be designed to ensure that there would be no increase in water temperature from loss of tree shade.

## **D. ALTERNATIVES DROPPED FROM DETAILED ANALYSIS**

### **1. Project 1 – Timber Management**

In addition to the No Action Alternative and the two Timber Management Action Alternatives described above, the IDT considered 12 additional areas for potential harvest and discussed a variety of additional options during the course of the analysis. The IDT considered the following alternatives that were dropped from detailed analysis.

#### **a) Additional harvest units**

The following units were dropped from this project due to resource conflicts.

1) Section 1

- D-1 (part), 2, 3, 4 and 7. Approx. 50 acres total. Dropped due to Riparian Reserve.
- D-5. Approx. 4 acres. Dropped due to red tree vole (RTV).

2) Section 3

- A-2, and 4. Approx. 4 acres. Dropped due to Riparian Reserve.
- A-3. Approx. 6 acres. Dropped due to RTV.

3) Section 5

- C-3 and 5.1. Approx. 5 acres. Dropped due to Riparian Reserve. Approx. 2-3 acres of C-3 is outside of Riparian Reserves and available for harvest, but was dropped by the IDT. This small stand sits between Riparian Reserve to the west and north, and a stand with a significant old growth component to the east. Skid trails are evident in and around this unit, but it has not been disturbed for several years. Logging would involve skidding logs more than 300 feet across a young managed timber stand to a road that has been decommissioned and would have to be renovated to be useable. The IDT judged that the potential adverse effects of harvesting timber in this unit are high relative to the benefit from harvesting this small amount of timber.
- C-1. Approx. 6 acres. Dropped due to RTV.
- Unnumbered. Approx. 10 acres west of unit C-4, between C-4 and C-3. Dropped due to habitat value of significant old-growth component.
- C-5. Approx. 11 acres. Dropped due to mollusk buffers. This unit was thinned in 1980 and is suitable for regeneration harvest, but not for thinning again. The site potential tree height buffer currently required for the mollusk species found below the skyline landing precludes logging below these sites.

4) Section 11

- B-3. Approx. 3 acres. Dropped due to Riparian Reserve.

5) T. 10 S., R. 4 E., Section 17

- E-1, Approx. 55 acres. Dropped when stand examinations showed that this is a poor site with growth rates too low to be managed as timber. It will be withdrawn from the timber base.

**b) Alternate Harvest Plans for Units Currently Included in the Action Alternatives**

1) Section 3

- A-1. Partial Cut: It was partial cut in 1971 and the trees are spaced fairly widely and are not fully utilizing the growing space. There is fairly recent windthrow in the unit, which led the IDT to conclude that opening the stand more with a partial cut would lead to unacceptably high windthrow among the retained trees.

2) Section 11

- Units B-1 and B-2. Regeneration Harvest: These stands have not yet reached culmination of mean annual increment (CMAI).
- Units B-1 and B-2. Density Management Harvest: The IDT considered a density management harvest to enhance structural diversity and accelerate recovery of old-growth characteristics. This is an objective on Connectivity blocks, but not in GFMA (RMP p. 48).

**c) Alternative – No New Road Construction**

The potential effects of implementing either of the timber management action alternatives without new road construction are within the scope of the action alternatives analyzed. The proposed temporary dirt road follows the path of an existing skid road on a flat bench at the top of unit B-2 that would be used again in this timber sale for ground based yarding, so the effects on water quality and soil productivity would be little different from not constructing it. The Cascades Field Manager could essentially implement a no new road construction alternative by simply choosing to exclude approximately five acres of partial cut which would be skyline logged from landings accessed by this road.

**d) Alternative – Young Stand (<80 Years) Thinning Only**

None of the stands identified in the action alternatives is significantly younger than 80 years. An alternative to only partial cut and only harvest in stands younger than 80 years old would not meet the Purpose of and Need for Action.

**2. *Project 3 – Fish Passage Improvement***

A perched culvert on Little Rock Creek near unit D-1 in Section 1 was initially considered to be the primary impediment to cutthroat trout inhabiting approximately two miles of stream above the culvert. The draft Watershed Analysis for the Middle North Santiam River (still in development) incorrectly identified Little Rock Creek as a steelhead salmon stream, with the obvious conclusion that this culvert would limit their ability to use the stream. A conceptual project to build weirs and baffles to allow fish to pass from the plunge pool below the culvert to the stream above the culvert was initially included in the Turnridge projects.

Further field work revealed that there is a perched culvert on private land downstream, and waterfalls (one in the Riparian Reserve/bald eagle habitat area adjacent to unit D-1) which would limit upstream migration of fish even if the culvert were made passable.

## **EA CHAPTER III - AFFECTED ENVIRONMENT**

Chapter III describes the present condition (i.e., affected environment) within the project area for the following resource categories: soil, hydrology and water quality, vegetation, wildlife, fire and fuels, and visual, recreation and rural interface resources. Additional resources or values for which review is required by statute, regulation, Executive Order, or policy, are described in Appendix A: Elements of the Environment.

### **A. ENVIRONMENT AFFECTED BY PROJECT 1 - TIMBER MANAGEMENT ALTERNATIVES A AND B**

#### **1. Soil**

- Soils on the proposed harvest units formed on the western part of the Cascade Range and are rated as warm soils. They formed in colluvium derived from sedimentary or basic igneous rock, and are moderately deep, to deep, well-drained, gently sloping to steep clay loams, stony loams, and gravelly loams.
- Previous logging throughout the area (logging of old growth forest in the early 1900s using tractors and highlead cable logging, and thinning sales in the 1970s and 1980s using tractors and skyline yarding) have left numerous compacted tractor skid roads and cable yarding roads in various stages of recovery.
- All soils are considered suitable for conifer timber management with manageable potential disease, drainage and brush competition problems.

#### **2. Hydrology and Water Quality**

##### **a) Project Area Precipitation and Basin Hydrology**

- The proposed Turnridge Timber Sale project area is located at elevations of 1,000 – 2,300 feet.
- The project area is generally not subject to rain-on-snow events.
- The project area is included in three sixth field watersheds in the Middle North Santiam River hydrologic unit: Turnridge Creek, Mad Creek, and Snake Creek. The primary streams draining the area are Snake Creek, Rock Creek and Mad Creek.
- Project area stream channels viewed in the field are currently in “proper functioning condition” as determined by the Resource Area Hydrologist. The Little Rock Creek channel has a large supply of cobble-boulder sized substrate over a bedrock bed. In the project area the channel is well armored, highly resilient, stable, and appears to be properly functioning.

## **b) Project Area Water Quality**

- The following parameters are potentially affected.
    - o Stream Temperature: Stream temperatures measured in the main stem of the North Santiam River (Summer 2000, North Santiam State Park) were below the State of Oregon's threshold of 17.8° C. (64° F.) where no measurable increases in stream temperatures are allowed in Non-Salmonid fish waters. The threshold for Salmonid fish producing waters is 14.4° C. (58° F.).
    - o Dissolved Oxygen and pH (hydrogen ion concentration): Levels of dissolved oxygen and pH were within state standards for the North Santiam River.
    - o Turbidity and Sediment: Levels of turbidity were within state standards for the North Santiam River.
  - Other water quality parameters (e.g., nutrients, pesticide residues, bacteria, etc.) are not affected by timber harvest and related activities and were not review for this analysis.
  - The North Santiam River above the confluence with the Little North Santiam River (downstream of the project area) is not listed in the DEQ's *1998 303d List of Water Quality Limited Streams*, a list of streams that do not meet the state's water quality standards.
  - The DEQ has also published *1988 Oregon Statewide Assessment of Non-point Sources of Water Pollution*, an assessment (the 319 Report) identifying streams with potential non-point source water pollution problems. Portions of the North Santiam River were identified as having moderate water quality problems, which may be affecting drinking water supplies. The probable causes of water quality problems are listed as landslides, erosion, reservoir operation, animal and human waste.
- ## **c) Beneficial Uses Associated with Streams in the Project Area**
- There are resident fish and aquatic life in the immediate vicinity of the project area and salmonid spawning and rearing habitat approximately one mile downstream in Mad Creek and Rock Creek.
  - There are irrigation and livestock watering water rights in Mad Creek and Rock Creek.
  - The City of Salem and other municipal water users draw water from the main stem of the North Santiam River more than one mile downstream from the project area.

## **3. Vegetation**

### **a) Proposed Timber Harvest Units**

- Common to all Units: The original old growths stands were logged in the early 1900s. The shrub understory is dominated by vine maple. Salal, sword fern and dwarf Oregon

grape are the primary ground cover species. No significant disease indicators were observed.

- **Table 3. Mapped Stand Type and Narrative Description of Timber Stands for Proposed Timber Harvest Units**

Unit/ Mapped Stand Type	Narrative Description of Timber Stand
<p>D-1</p> <p>This stand is a composite of two distinct forest types: D4H4-1800/D3=1900, and D3=1920</p>	<p>Part of the stand is mature Douglas-fir and western hemlock with a few scattered old growth trees and snags left over from the original logging. Second growth trees range from 85 to 120 years old. The scattered old growth trees are older than 200 years. The average diameter of the second growth stand is approximately 32 inches.</p> <p>Stand exam data indicates that the younger, mid-seral stand is approximately 65 years old with an average diameter of 19 inches. There are a few old growth snags, but very little hard CWD.</p>
<p>D-6.1 and 6.2</p> <p>D4=1900: These two potential harvest units are essentially parts of a single stand. A stream and its associated Riparian Reserve separate the two units. There are islands with different stand characteristics in the units.</p>	<p>The current stand was partial cut in a 1968 timber sale. Approximately eight acres in the north end of unit D-6.2 was commercially thinned in a 1974 timber sale. The average stand age in these two units is approximately 100 years with an average diameter of 24-26 inches. The current stand is apparently composed of trees that were understory seedlings when the old growth was cut and natural seeding after logging. This resulted in patchy reforestation with several openings, which filled in with vine maple, and highly variable crown closures ranging from 40-80 percent. There is some mature red alder in some of the openings. There is a small patch of D3=1930 (4 acres) along the west side of 6.2 and some recent windthrow along the west edge of 6.1 adjacent to a clearcut. No green old growth trees have been found in these units. Large, sound snags and CWD are scarce. The timber here is in the mature stage of succession and has reached CMAI</p>
<p>D-8.1</p> <p>This unit is composed of two distinct type islands: D4=1900 and D3=1940</p>	<p>The older stand was partial cut in a 1974 timber sale. There is no old growth, no snag component and very little CWD in the stands. The overstory is almost entirely Douglas-fir, with a little bit of western hemlock. The understory has western hemlock, bigleaf maple, and red alder. The older stand is in the mature stage of succession and has reached CMAI.</p> <p>The younger stand is in the mid-seral stage. There has been no management activity in the younger stand</p>
<p>D-8.2</p> <p>D4H4-1800/D4=1900</p>	<p>The stand is a mature Douglas-fir and western hemlock type with a scattering of residual old growth snags, but no green old growth trees. The entire stand was partial cut in the 1974 timber sale. Some CWD is present, but most of it is in advanced stages of decay.</p>
<p>A-1</p> <p>D4=1920</p>	<p>This is a very uniform stand of mature Douglas-fir, both in spacing and tree size. The average age is approximately 80 years, the average diameter is 24 inches, and the stand has essentially reached CMAI. This stand was thinned in the 1970s. There is a hardwood (red alder and bigleaf maple) component in parts of this stand. Some windthrow has occurred recently. While there are some old growth remnant trees in the vicinity of the unit, none have yet been found inside the proposed unit boundaries. The shrub understory is fairly light and made up of California hazel and vine maple.</p>

Unit/ Mapped Stand Type	Narrative Description of Timber Stand
C-2 D4H4-1800, D3=1920	The D3=1920 stand was thinned in a 1980 timber sale and is an average of 84 years old and 20 inches diameter, is in the mature stage of succession, and has reached CMAI. The old growth trees and snags are widely scattered, and there are moderate amounts of CWD, very little of which is hard. There are some large bigleaf maples in the overstory and also a component of red alder. Canopy closures are low, ranging from 40-60 percent.
C-4 D3=1920, D3=blm-1940	This area was apparently the edge of the original harvest unit logged in the early 1900s, as there is a predominantly old growth stand immediately west of this unit. Part of the stand was partial cut in a 1972 timber sale. This mid-seral stand is primarily Douglas-fir with an average diameter of 14 inches, ranging from 60 to 80 years old. Understory tree species include western hemlock, bigleaf maple and red alder. Half of the stand has canopy closures from 60-80 percent while the other half of the stand is more open, with large bigleaf maple trees in the overstory. The shrub understory is dominated by vine maple. There is very little CWD.
B-1 and B-2  These two units are essentially the same forest stand, divided into two potential harvest units by a stream and associated Riparian Reserve. D3=1920 with scattered old growth	The stand is approximately 80 years old, is in the mature stage of succession, has a canopy closure of 60-80 percent, and is approaching CMAI. The entire stand was partial cut in a 1972 timber sale. Both the Douglas-fir and the western hemlock have a high crown ratio and sufficient growing room. Western hemlock, bigleaf maple, red alder and some western redcedar are found in the understory. There is some CWD, most of which is in advanced states of decay. The shrub understory is absent from much of the stand. Where it is present in areas opened up by the partial cut, it is dominated by vine maple with some huckleberry.

**b) Special Status Plant Species and Survey and Manage Plant Species**

- Botanical inventories for lichens, bryophytes and vascular plants were completed during the summers of 2000 and 2001 using established survey methods and protocols. No Special Status Species or Survey and Manage Species were found.

**c) Noxious Weeds and Invasive Plant Species**

- Several Priority III noxious weed species were found within or adjacent to proposed project area. All of these species are considered to be common components of the roadside plant communities in western Oregon. Infestation levels are minimal and the forest canopy is providing shade that keeps these infestations in check. No Priority I or II noxious weed species or other invasive plant species of concern were identified.

**4. Wildlife**

**a) Upland Habitat**

- Tree, brush and ground cover species, seral stage, canopy closure, old growth remnant, snag and CWD component elements of the affected environment are generally described in the Vegetation section above. Additional details for some aspects of these elements are given below.
- There are a few old growth trees scattered through units B-1, B-2, D-1 and C-2. They never reach the level of one per acre, and usually have densities of less than one half old growth tree per acre.

- There are no old-growth remnants in units A-1, C-4, D-6, and D-8.
- There is a larger mature second growth tree component with trees up to approximately 44 inches diameter in units A-1, C-2, D-6, and D-8.
- Generally there is a shortage of large snags and coarse woody debris (CWD), especially in the early stages of decay (decay classes 1 and 2). Quantities present in these stands do not meet Northwest Forest Plan (NFP) standards. The highest amounts of CWD and snags are present in units B-1, B-2, C-2 and portions of D-1.
- There are no special habitats (meadows, talus slopes, cliffs and wetlands) within the proposed harvest units.
- Microhabitat drying is anticipated, but expected to be minimal due to high green tree retention in partial cut and thinning harvest units.

**b) Special Status, SEIS Special Attention, and other Species of Concern - Terrestrial**

1) Northern Spotted Owl – Federally Listed

- Units A-1, B-1&2, C-2, D-6, and portions of D-1 and D-8 provide 169 acres of suitable (dispersal, foraging, roosting and nesting) habitat.
- Units C-4 and portions of D-1 and D-8 provide 18 acres of dispersal habitat, but lack the structure required for suitable habitat.
- None of the proposed harvest units is located within Critical Habitat for the northern spotted owl.
- The proposed Turnridge Timber Sale is within the provincial home range radius (1.2 miles) of two active known spotted owl sites. Portions of units D-6, A-1 and B-1 are 1.0 to 1.2 miles from a site. There are also two historic sites, which are no longer occupied, within 1.2 miles of five of the proposed harvest units.

2) Bald Eagle – Federally Listed

- Bald eagles have never been observed in the vicinity of the Turnridge proposal. They have been observed along the North Santiam River, 1-2 miles to the north, during the winter months.
- A bald eagle habitat site was established in the Riparian Reserve adjacent to unit D-1 to provide habitat for potential future nesting bald eagles and meet the recovery goals in the Pacific Bald Eagle Recovery Plan.

3) Bureau Sensitive, SEIS Special Attention, and Other Species of Concern

- **Amphibians** surveys were conducted concurrently with mollusk surveys. Several species were found, including the Oregon slender salamander, a Bureau Sensitive species. This salamander prefers CWD in advanced stages of decay, which is generally in short supply in the proposed units.
- Four species of **bats** listed as Protection Buffer and/or Bureau Tracking species could potentially be present in the project area. The only suitable habitat found in the proposed units is standing snags with the bark attached. There are some of these snags in unit C-2.

- The **goshawk** is a Bureau Sensitive species that prefers older forests with dense canopy closures at higher elevations. The proposed units are located at low elevations (1,000 – 2,300 feet). The habitat in the vicinity of the proposed units is marginally suitable for goshawks. No goshawks have been observed in the Turnridge area during wildlife surveys and other fieldwork.
- The **olive-sided flycatcher**, a Bureau Tracking species, uses snags and remnant green old growth trees that emerge above the canopy in forested areas for feeding and territorial display. They nest in smaller trees in the understory. The species is uncommon and local at all elevations throughout the Cascades Resource Area. One olive-sided flycatcher was observed adjacent to unit D-1.
- The **red tree vole**, a Survey and Manage species, is generally thought to be associated with late successional forests, although it has been observed using younger forests. All of the proposed units and their vicinities were surveyed according to current protocols in September and October of 2000.
  - o The A units in section 3: Nine potential nest structures were found during surveys. Four active and two inactive nests were found. Nests were found in units A-2, 3, and 4, all of which were dropped from the proposal. No red tree vole nests, active or inactive, were found in or adjacent to unit A-1.
  - o The B units in section 11: No potential red tree vole nest structures were found during surveys or other fieldwork.
  - o The C units in section 5: One potential nest structure was found in unit C-1 and determined to be an active nest. Unit C-1 was dropped from the proposal.
  - o The D units in section 1: Twelve potential nest structures were found, three of which were found to be active nests. Units D-4 and 5 were dropped from the proposal when active nests were found inside the units. D-6 was modified to provide the required buffer around the nest tree and is still included in the proposed action alternatives.
- Surveys were conducted for the eight survey and manage **mollusk** species on the October 1998 list that were known or suspected to occur with the Cascades Resource Area. Since then, four of those species have been dropped from Survey and Manage status and are not pertinent to this analysis. Surveys on the A, B and C units were conducted between December 1999 and April 2000. Surveys on the D units were conducted March – April 2000, June 2000, March – May 2001 and October 2001. All surveys were done to protocol.
  - o The A units in section 3: Several *Megomphix hemphilli* were found in units A-2, 3 and 4, which have been dropped from the proposal. No survey and manage species were found in the vicinity of A-1.
  - o The B units in section 11: *Megomphix hemphilli* were found at seven locations in the vicinity of the B units
  - o The C units in section 5: *Megomphix hemphilli* were found at nine locations in the vicinity of units C-3, 4 and 5. Units C-3 and 5 have been dropped from the proposal. Four sites are adjacent to unit C-4. The D units in section 1: *Megomphix hemphilli* were found at seven locations in the vicinity of units D-1, 3, 6 and 8. Unit D-3 has been dropped from the proposal.

**c) Cumulative Effects - Late Successional Habitat and Road Density**

- 38 percent of the Middle North Santiam Watershed is currently in late successional forest habitat, exceeding the 15 percent guideline.
- Road density in the area is calculated at approximately five miles per section, which is high. There are few gates in this area and over 90 percent of the existing roads are open year around.

**d) Fish**

- According to the North Santiam Watershed Assessment, low levels of large wood in stream channels in this area have resulted in reduced cover and pool habitat for fish throughout the watershed.
- All streams within the proposed project area were checked for fish presence/absence on May 5, 2001.
  - o Section 1: Little Rock Creek, adjacent to unit D-1 within the bald eagle habitat site, is the only fish bearing stream in this section. It supports a population of cutthroat trout up to the crossing of road 10-3E-2, where a perched culvert blocks fish distribution. Habitat upstream of the culvert is in good condition and of suitable gradient to support cutthroat trout.
  - o Section 3: The stream adjacent to unit A-1 is too small to support fish.
  - o Section 5: Cutthroat trout are present in the stream adjacent to the northwest corner of unit C-2. Fish presence was also noted in the stream on the west side of section 5, but all potential harvest units in that area were dropped from the proposal. No fish are present in streams adjacent to any other proposed harvest unit in the section.
  - o Section 11: None of the streams draining the BLM portion of this section are large enough to support fish.
- Mad Creek, downstream of unit D-1, supports a population of native winter steelhead.
- The North Santiam River, downstream of all units in the proposal, supports native populations winter steelhead, cutthroat trout, Pacific lamprey, mountain whitefish, suckers, dace, redbelt shiner and northern pikeminnow. It also supports introduced stocks of summer steelhead, resident rainbow trout, and spring Chinook salmon. Spring Chinook salmon are native to the Santiam basin, however, the native run is believed to be extinct.

**e) Special Status, SEIS Special Attention, and other Species of Concern - Fish**

- The Upper Willamette River Evolutionarily Significant Units of winter steelhead trout and spring Chinook salmon were listed as threatened by the National Marine Fisheries Service (NMFS) in March 1999. Consultation with the NMFS on this proposal is in progress.

## 5. *Fire and Fuels*

### a) **Wildfire**

- Charred snags, charred down logs, fire scars on snags and green old growth trees, and charcoal in the soil on all units indicate that all of the proposed units have had at least two fires.
- Risk of ignition may be higher from human causes than from lightening or other natural sources of ignition. The climate is mild and wet in the winter and, during average weather years, conditions remain relatively moist under the forest canopy even during the warm, dry late summer months.
- Based on the following sources, the fire regime for this site could be described as “long return interval (100-300 years) crown fires and severe surface fires in combination.” Severe fires could only occur when there is a source of ignition while fuel and weather conditions are suitable for fire spread. East wind events would significantly increase wildfire behavior.
  - o The historical record, including Cadastral Survey notes of the late 1800s, does not have any definitive information on past wildfires, though some of the notes (such as brushy lines, small diameter bearing trees or having to use mounds of stones for witness monuments because there were no large trees, etc.) indicate that there had been a major fire in the past few decades.
  - o The draft *Integrated Natural Fuels Management Strategy*, 24 April 2000, for the Willamette National Forest and the Eugene and Salem Districts, BLM show two fire regimes in the sale area. Sections 1 and 3 are Fire Regime 4, while sections 5 and 11 are Fire Regimes 3 and 4. Fire Regime 3 is variable severity with moderate frequency (50-100 years). Fire Regime 4 is variable severity with low frequency (100-200 years). Fire intensities are a measure of how much of the forest canopy is killed: Low <30 percent; Moderate = 30-70 percent; and Severe >70 percent.
- Lightening pattern maps show that the area has the potential for one to two lightening storms a year, indicating a low potential for ignition.
- Multiple conifer plantations less than 20 years old in the vicinity have a relatively large amount of exposed fuel less than three inches in diameter. This could present a low to moderated hazard of escaped fire during broadcast burning.

### b) **Fire Effects on Habitat and Site Productivity**

- Conifer reestablishment without human intervention after wildfires could have taken decades due to brush competition. This would lead to a variety of conifer ages and densities, patchiness and variable density, and a continuously changing mix of shade tolerant/intolerant understory and groundcover species. This would develop complex stand structure and plant and animal species until a fairly uniform conifer forest developed.
- The duff and litter layer is typically less than one inch thick, indicating that litter fall is decayed and used in the nutrient cycle quickly. This serves to keep fuel loadings low during early and mid-seral stages of the forest stand.

## 6. *Visual, Recreation, and Rural Interface Resources*

### a) **Visual Resources**

- All of the proposed units are classified as Visual Resource Management (VRM) Class III. Management objectives call for partial retention of the existing landscape with moderate levels of change to the characteristic landscape. Management activities may attract attention, but should not dominate the view of the casual observer.
- The area surrounding Kingwood Avenue was identified as the critical viewing area. Timber management activities on both private and public land are readily observable throughout the area surrounding the proposed harvest units and some of the proposed harvest units are likely to be somewhat visible after harvest.
- From State Highway 22, all of the proposed units would appear in the background if they were visible at all.

### b) **Recreation Resources**

- The project area is a forest setting accessed by gravel roads with no developed recreational facilities. The natural setting has been commonly altered by timber management activities (roads, logged areas, plantations, etc.), which are likely to continue on private and state lands in the vicinity regardless of federal management practices. Fire rings, rustic campsite modifications and undesignated trails in the area are apparently associated with dispersed camping, hunting, target shooting, hiking, horseback riding and off-highway vehicle use.

### c) **Rural Interface**

- None of the proposed units are directly adjacent to private residences or non-forest uses.
  - o Units A-1 and D-1: Residences within ½ mile are relative low in density.
  - o Units C-2 and C-4: Residences within ½ mile are concentrated in small subdivisions on the outskirts of Mill City.
- The haul routes for all units pass by residences before feeding onto Kingwood Avenue, a two lane paved county road. All of these roads have a history of log truck traffic from timber harvests on BLM, private, and state lands.

## 7. *Other Resources*

- **Special Forest Products:** There is no known demand for the transplants or greenery that could be available on these sites. There is a known demand for moss, but few areas have the brush understory that would support commercial quantities. Firewood from landing debris piles would be in demand, but does not currently exist in the affected environment.

## **B. ENVIRONMENT AFFECTED BY PROJECT 2 – RIPARIAN RESERVE TREATMENT**

### **a) Section 1**

- Approximately 90 percent of the Riparian Reserve area is forested with mature timber stands, at least as old as the adjacent timber stands described above. Composition is diverse with some canopy gaps and vertical canopy layering. Many trees are larger than 20 inches diameter, but many of the snags were removed when the stands were thinned approximately 30 years ago. Adequate CWD is present, but sound snags are lacking.
- The remaining ten percent of the area is in much younger conifer plantations with little or no structural development.

### **b) Section 3**

- Approximately 90 percent of the Riparian Reserve near unit A-1 is in a Douglas-fir plantation which was precommercially thinned to a 12'X12' spacing in 1984. There is very little structural diversity except for some red alder, bigleaf maple and brush in some of the more open areas.
- The remaining ten percent of the area is an 80 year old conifer stand with some large trees and understory vegetation but very few snags left after the 1972 commercial thinning. Adequate CWD is present.

### **c) Section 5**

- Approximately 20 percent of the Riparian Reserve area is a mature conifer stand with an old growth component. Structure here is generally diverse, however, a portion of it was thinned in 1972 and many of the snags were removed. Adequate CWD is present.
- Approximately 60 percent of the area is a mid-seral mixed conifer/hardwood stand. Species composition is diverse and stand structure is developing, but decadence related diversity is low.
- The remaining 20 percent is early seral conifer plantations thinned to 16'X16' spacing in 1991. There is very little structural or species diversity.

### **d) Section 11**

- All of the Riparian Reserves here are a mature 80 year old conifer stand. Species composition is diverse, there are many trees larger than 20 inches diameter, and some canopy gaps and vertical layering are developing. There is adequate CWD, but most of the snags were removed in the 1973 commercial thinning.

## **EA CHAPTER IV - ENVIRONMENTAL EFFECTS**

Chapter IV summarizes the changes that can be expected as a result of implementing the alternatives. The “no action” alternative sets the environmental base line for comparing effects of the action alternatives. The environmental effects (changes from present base line condition) that are described in this chapter cover the following resource categories: soils and water, vegetation, wildlife, fish, fire and fuels, recreation and rural interface resources, visual resources. For those resources or values which review is required by statute, regulation, Executive Order, or policy, Appendix A contains the appropriate documentation as to the effects of the project on those resources or values. For a full discussion of the physical, biological, and social resources of the Salem District, refer to *RMP/FEIS*. The discussion in this document is site-specific<sup>1</sup> and supplements the discussion in the *RMP/FEIS*. Resource values are not identified in this section when there are no site specific impacts, site specific impacts are considered negligible, or the cumulative impacts described in chapters 3 and 4 of the *RMP/FEIS* are considered adequate.

### **A. EFFECTS OF THE NO ACTION ALTERNATIVE**

- The long term timber producing capability on the project area would remain unchanged.
- There would be no immediate timber harvest or benefit to the economy from timber harvest in the short term.
- Long term timber biomass growth would be slightly higher than it would for the proposed partial cut harvest units since the productive capability of the site would be utilized at current stocking levels rather than reduced stocking levels.
- Long term timber biomass growth would be lower with no action than it would be for the proposed regeneration harvest units since the new planted stands would not have reached CMAI.
- Structural diversity within these stands would continue to develop at the current rate.
- Aquatic Conservation Strategy Objectives (ACSO) would be met at the “Maintain” level.
- All other resources would remain as described in Chapter III, Affected Environment, with changes occurring at natural rates.

---

<sup>1</sup> This EA does not attempt to re-analyze all possible impacts that have already been analyzed in the *RMP/FEIS*, but rather to identify the particular site specific impacts that could reasonably occur.

## **B. EFFECTS OF PROJECT 1, TIMBER MANAGEMENT**

### **1. Soils**

#### **a) Long Term Soil Productivity Loss from Compaction, TM Alternatives A and B**

##### 1) Roads:

- There would be no net increase in roads or in land taken out of the productive base due to road construction.
- No significant change in soil productivity would be expected from the temporary road, which would be decommissioned.

##### 2) Tractor Skidding/Ground Based Logging Equipment:

- Ten percent or less of the area would be used for main skid roads and be compacted, much of which has already been compacted by previous harvest operations.
  - o This would result in approximately one to two percent loss in long-term soil productivity compared to undisturbed soil in regeneration harvest units (TM Alternative A only) where skid trails would be ripped.
  - o This would result in approximately five to six percent loss in long-term soil productivity compared to undisturbed soil in partial cut harvest units (TM Alternatives A and B) where skid trails would not be ripped.
  - o Comparisons to undisturbed soil provide a more severe estimate of effect than comparison to the existing condition with existing skid trails from previous operations. Comparison to the existing condition would require detailed information on the full extent of existing skid trails and logging plan, which are not available.
- Compaction from harvesters operating on top of a slash mat with single (rarely two) passes would be negligible, as demonstrated by experience with this type of operation.

##### 3) Skyline Yarding:

- Approximately one to five percent of the area would be compacted by skyline yarding with partial (one end) suspension.
  - o This would result in one to three percent loss in long-term soil productivity compared to the same area without compaction.
  - o The ranges for area compacted and percent productivity loss allow for the range of seasonal soil and weather conditions during operations.
  - o Some compaction already exists from previous timber harvest operations, both cable and tractor. As many as possible of these previously compacted skyline yarding roads would be re-used to avoid impacting new area.

##### 4) Site Preparation

- Low intensity broadcast burning would result in an anticipated 200 – 300 kilograms of nitrogen / hectare (kgN/ha) loss from unit D-6.2. Atmospheric inputs should replace this loss within a 60-year period. Nitrogen fixing plants anticipated on the harvested

area could replace the nitrogen within five to 20 years. Negligible long-term productivity loss would be anticipated from this nitrogen loss and recovery rate.

**b) Soil Erosion**

- Analysis of soil erodability ratings and site factors indicates that soil erosion would be low to moderate on all units with the design features incorporated into the proposal.
- Soils disturbed by uprooting vine maple would be very porous and rough textured so that water would infiltrate rather than running off. These areas would re-vegetate quickly with grasses, forbs and vine maple sprouts to further stabilize the soil.

## **2. Hydrology and Water Quality**

**a) Project Area Stream Flow**

- Timber harvest would likely result in some small increase in water yield, which correlates with the removal of the conifer over-story. However, it is likely to have little biological or physical significance.
- The Turnridge projects are unlikely to directly alter base flow or peak flow events in a measurable manner due to the small area considered in this action. Therefore, the action was analyzed for its potential contribution to cumulative effects to peak flows in this watershed, see below.

**b) Stream Temperature:**

- Forest density and shading on perennial and tributary stream channels would be left virtually unaltered under the Turnridge proposal. Overall, these projects would be unlikely to have any measurable effect on stream temperatures in this watershed.

**c) Dissolved Oxygen and pH (hydrogen ion concentration):**

- The Turnridge projects are unlikely to result in any measurable increase in temperature, sedimentation or fresh organic materials in streams in the project area, so no measurable effect on dissolved oxygen would be expected.
- Available research indicates that most forest management activities have little effect on pH or conductivity. It is unlikely that these projects would have any measurable effect on them in project area streams.

**d) Turbidity and Sediment:**

- Surface erosion on forested land in Western Oregon is rare due to the high infiltration capacity of native soils, heavy vegetative growth and deep layers of surface organic material. Erosion in the harvest units would be very low and experience shows that little of the overland flow carrying sediment from within a harvest unit would reach any stream channels, but would be filtered by the essentially undisturbed soil and vegetation of the Riparian Reserve.
- Some sediment would be generated from the gravel roads in the area. Hauling restrictions during heavy rainfall, proper drainage maintenance, and sediment traps would prevent more than minimal increases in sediment introduced into streams.

**e) Effects on Stream Channels:**

- In the short term, this proposal is unlikely to alter the current condition of channels in the project area.
- Over the long term, the proposed projects could increase large wood recruitment into streams in the area, which would improve aquatic habitat. No other alteration to the current condition of channels would be expected.

**f) Aquatic Conservation Strategy Objectives**

- Riparian Reserves in the project area, established to the standards described in Chapter 3, were designed to ensure that, in almost all cases, proposed treatments outside of these areas have little or no potential to directly or indirectly affect water quality (ACSOs #3, maintains the physical integrity of stream channels; #4, maintains water quality; and #5, maintains sediment regime).
- No measurable changes to stream flows (ACSO #6, peak flow characteristics), or frequency or timing of storm events (ACSO #7, timing of flood plain inundation and water tables) would be expected as a result of the proposed projects.

**g) Effects on Downstream Beneficial Uses:**

- None of the above elements which could affect downstream beneficial uses would be expected to have more than minimal changes, so no effects on downstream beneficial uses would be expected from the proposed projects.

*Cumulative Effects*

**h) Basic Ten-Year Scenario for Modeling**

- The “base line” for modeling is a theoretical, fully forested, “hydrologically mature” state in the watershed.
- Federal Lands – Turnridge is the only action proposed in these watersheds that are likely to be completed in this decade. The two proposed action alternatives were used for analysis. GIS data was used for cover types on BLM land.
- State Lands – Oregon Department of Forestry provided maps showing all current and proposed timber harvest on Santiam State Forest lands in the area and this data was incorporated into the analysis.
- Private lands – Timber harvest plans are not available for private lands since they are subject to rapid change. This analysis assumes that all mature timber on private lands would likely be harvested in this decade.
- Modeling of the “natural” disturbance state assumed that Native Americans likely kept the lowlands burned off and in an “immature” hydrologic state. All streams in the area were buffered by 30 meters of unburned, hydrologically “mature” vegetation. The upland acres were divided equally between mature, intermediate and immature to reflect cycles of fire, other natural disturbance events, and growth of the forest.

i) **Cumulative Effects using the Water Available for Runoff (WAR) Analysis**

1) The following scenarios were analyzed:

- **Theoretical Fully Forested Condition.** This provides the theoretical baseline to compare other scenarios. It assumes that all land is forested and hydrologically mature, yielding minimum runoff. This is not now, and probably never has been, actually present.
- **Theoretical Fire Disturbance.** This is the “natural” state described in the section above. It provides an interesting comparison with what might have been expected under Native American management practices prior to European influence.
- **Existing Conditions.** This is how what we have now is modeled.
- **Harvest on All Ownerships.** BLM proposed actions combined with all actions on other ownerships in the watershed. With Alternative A on BLM land, this is the theoretical maximum effect.
- **Harvest Only on Other Ownerships.** This isolates the effects of the two proposed action alternatives.
- The effect of the “No Action” alternative would be somewhere between the “existing condition” and the percent change calculated from the analyzed scenarios.

2) Results of Modeling

- The greatest percentage change in flow rates compared to baseline (theoretical fully forested) levels always occurred in the more frequent, less severe storm events with snow pack melted by the rains. There was progressively less difference between the baseline flows and anticipated flows in each model as the storms were more severe and less frequent. The table below shows only the two-year frequency storms since they show the greatest change.
- “Q” is the modeling term for frequency, followed by the average number of years expected between storms of that severity. The plus indicates a significant snow pack. So, “Q2” is a storm you would expect to have every two years with rain falling on wet ground or a light snow cover. “Q2+” is the same type of storm falling on a heavier snow cover, which would melt and add its water to the runoff. (For comparison, “Q50+” would be more like the 1996 flood storm where heavy, warm rain fell on a heavy snow pack.)

**Table 4. Results of Modeling for Two-Year Storm Events in the Turnridge Projects Area**

Model	Flow Cubic Feet per Second (CFS) (Modeled)		Percent Change from Baseline (Modeled)		Percent Change from Existing Conditions (Calculated)*	
	Q2	Q2+	Q2	Q2+	Q2	Q2+
Theoretical Fully Forested (Baseline)	950	1661	0	0	-0.1	-19.8
Theoretical Fire Disturbance (Theoretical Natural State)	950	1971	0.1	19.1	-0.1	-4.83
<b>Existing Conditions (Reference point for changes)</b>	<b>951</b>	<b>2071</b>	<b>0.1</b>	<b>24.7</b>	<b>0</b>	<b>0</b>
Full Harvest on All Ownerships BLM Alternative A	951	2130	0.1	28.3	0	2.8
Full Harvest on All Ownerships BLM Alternative B	951	2123	0.1	27.8	0	2.5
Harvest Only on BLM Land, No Harvest on State or Private Lands Alternative A	951	2087	0.1	25.7	0	0.8
Harvest Only on BLM Land, No Harvest on State or Private Lands Alternative B	951	2080	0.1	25.2	0	0.4
Harvest Only on Other Ownerships - BLM No Action	951	2114 **	0.1	27.3	0	2.1

\* % Change from Existing Condition = (CFS Flow for Each Model in Col. 1 ÷ CFS Flow in Cols. 2&3 for the Existing Condition) – 1.00 to get the decimal ratio. Multiply the decimal by 100 to show percent. Example: For Full Harvest on All Ownerships, BLM Alternative A the calculation is: (2130 ÷ 2071) – 1.00 = 1.028 – 1.00 = 0.028, 0.028 X 100 = 2.8 percent increase above the flow expected with existing conditions.

\*\* Other Ownerships Harvest = Existing Conditions + (All Ownerships Harvest – BLM Only Harvest) = 2071 + (2130 – 2087)

**j) Discussion of Practical Implications of the Modeling**

- In WAR modeling, changes of less than ten percent in WAR values are considered to be below detection.
- For “normal” storm events (rain on wet ground or light snow cover), no detectable increases in peak flow, relative to the theoretical fully forested condition baseline, are expected to result from implementing either Timber Management Alternative (A or B) in conjunction with activities assumed on State and private lands in the ten-year scenario. The 0.1 percent increase (or 0.2, depending on rounding in the model) from 950 to 951 CFS is within the range of error for the WAR model calculations and well below the ten percent level considered to be below detection in the model.
- For “unusual” storm events (warm rain on heavier snow pack or similar) there are significant increases in peak flows compared to the theoretical fully forested condition baseline for several scenarios, as shown in the table above. This leads to a “sensitivity rating of indeterminate” for the possibility of adverse effects. This rating does not require that the actions considered under the Turnridge proposals be delayed or postponed.

- Peak flow increases greater than 20 percent above the baseline do point to the possibility of impacts to the aquatic ecosystem at some point during the ten-year analysis period. This has already been exceeded by the Existing Conditions (24.7 percent change).
- If the full harvest on all ownerships with BLM TM Alternative A (highest impact modeled) were implemented, peak flows are modeled as 28.3 percent above baseline for the Q2+ storm event. Of this: 24.7 percent is the existing condition, 2.6 percent is from State and private harvest, and 1.0 percent is from BLM TM Alternative A. (TM Alternative B would contribute only 0.5 percent.)
- If the actual Existing Condition were used as the baseline, full harvest on all ownerships with BLM TM Alternative A would result in a 2.8 percent increase in peak flows from a Q2+ storm, of which 0.8 percent would be from timber management activities on BLM land under TM Alternative A. (The comparable increase from TM Alternative B would be 0.4 percent.)

### 3. *Vegetation*

#### a) **Specific to Regeneration Harvest Units, TM Alternative A**

##### 1) GFMA Units D-6.1, 6.2, 8.1 (part), and 8.2 in Section 1; and A-1 in Section 3

- Existing mature Douglas-fir and western hemlock forest stands would be converted to young conifer plantations.
- These plantations would re-establish generally the same forest stand type over time, with the addition of a stronger component of western red cedar, which would be planted along with the Douglas-fir and western hemlock. Bigleaf maple and red alder would seed in naturally and be a part of the maturing stand.
- Brush species would sprout and compete with planted conifer seedlings. Standard stocking surveys would determine if additional measures are needed to ensure survival and growth of the planted conifers.
- Retaining 10-12 green trees per acre (6-8 to be large trees in the future stand, 2 for CWD and 2 for snags) would contribute elements of structural diversity in the future timber stand.

##### 2) Connectivity Block Unit C-2 in Section 5

- As described above, the mature conifer forest stand would be converted to a young conifer plantation with brush, which would re-establish a very similar mature stand over time.
- Retaining 18-20 green trees per acre (including the scattered old growth trees) in clumps and scattered randomly would contribute to horizontal diversity and vertical layering of the canopy as the stand matures. CWD and snag habitat would develop as some of those trees die and fall.

- The shade from this many retained green trees would be expected to slow growth and reduce timber yield for the rotation, compared to a more open condition for the developing plantation.
- b) Specific to Commercial Thinning Units, TM Alternatives A and B**
- A relatively intact timber stand would be maintained after harvest.
  - Due to the relatively young age and vigor of portions of Units D-1 and D-8.1, commercial thinning would result in increased growth of the retained trees as they fully reoccupy the site. This would delay CMAI and the retained trees would reach larger diameters faster than if the stand were not thinned.
  - The average stand diameter would increase, as smaller trees would be primarily selected for harvest.
  - Increased light reaching the understory would increase its growth until the canopy closed again and reduced understory growth.
- c) Specific to Partial Cut Harvest Units, TM Alternatives A and B**
- Canopy closure would decrease, resulting in increased understory growth.
  - No significant increases in growth of the retained trees would be expected.
  - Overall growing stock for future harvest would be reduced by this intermediate harvest.
  - A relatively open timber stand would be maintained after harvest.
- d) Noxious Weeds and Invasive Plant Species**
- Existing populations would become more vigorous with increased light after harvest activities. As the canopies close again, vigor of these populations would be expected to decline again to essentially current levels. No significant spread would be expected as a result of implementing the projects or alternatives.

#### **4. Wildlife**

##### **a) Upland Habitat**

###### **1) General**

###### **Effects Common to Thinning and Partial Cut Harvest Units, TM Alternatives A and B**

- In the short term, there would be some direct adverse impacts to existing snags and CWD habitat due to logging and site preparation activities.
- Two acres of unit D-1 would be impacted by the removal of CWD (salvage) in excess of NFP standards.
- In the long term, snag densities and CWD levels would increase and approach NFP standards due to the green tree retention, CWD recruitment and topping included in the design features.
- Design features to protect green old growth trees are expected to be effective in preventing loss of any of these trees.

- Some old growth early decay class snags, particularly in unit C-2, would potentially be felled or damaged during logging due to operational or safety considerations.

**Effects Specific to Regeneration Harvest Units, TM Alternative A**

- Direct impacts to existing snags and CWD would be higher than in partial cut harvest.
- Micro-habitat drying would be higher than in partial cut harvest.

**b) Special Status, SEIS Special Attention, and other Species of Concern – Terrestrial**

1) Northern Spotted Owl – Federally Listed

**Effects Common to Thinning and Partial Cut Harvest Units, TM Alternatives A and B**

- Timber management activities may adversely affect the spotted owl due to suitable habitat modification. The Turnridge timber management proposal was submitted for Formal Consultation with U.S. Fish and Wildlife Service on September 3, 2002. Consultation is still in progress and a Biological Opinion is still pending.
- The seasonal restriction on all units would minimize the risk of disturbance if nesting spotted owls were encountered within the disturbance range (0.25 to 0.5 mile) of the proposed harvest units.
- In the short term, 18 acres of dispersal habitat would be altered as a result of commercial thinning in portions of units D-1 and D-8, and partial cutting in unit C-4, but would still be maintained as dispersal habitat after harvest. In the long term, canopy closures would increase and these stands could attain suitable habitat conditions within 10 to 20 years.
- In the short term, 86 acres of suitable habitat would be downgraded to dispersal habitat as a result of partial cut harvest. In the long term, suitable habitat conditions would develop again in 20 to 30 years.
- Two acres of suitable habitat would be affected by the removal of CWD in excess of NFP standards as a result of salvage.
- 27 acres of suitable habitat in portions of units A-1, B-1 and D-6, which are within the provincial home range radius (1.2 miles) of two known spotted owl sites, would be removed (21 acres in A-1 and D-6) or downgraded to dispersal habitat (6 acres in B-1) as a result of harvest. The closest known spotted owl activity center is 1 mile away from these proposed harvest units.

**Effects Specific to Partial Cut Harvest Units, TM Alternative B, only**

- In the short term, 68 acres of suitable habitat in units C-2, D-6 and portions of D-8 would be downgraded to non-suitable habitat as a result of partial cutting. In the long term, suitable habitat conditions could develop again in 30 to 40 years.
- 17 acres of suitable habitat in portions of units B-1 and D-6, which are within the provincial home range radius (1.2 miles) of two known spotted owl sites, would be either downgraded to non-suitable habitat (11 acres of unit D-6) or downgraded to dispersal habitat (6 acres in B-1) as a result of partial cutting. The closest known spotted owl activity center is one mile away from these proposed units.

### **Effects Specific to Regeneration Harvest Units, TM Alternative A**

- In the short term, 81 acres of suitable habitat for the spotted owl would be removed as a result of regeneration harvest. In the long term, these stands would attain suitable habitat conditions in 70 to 80 years.
- 2) Bald Eagle – Federally Listed
- The Turnridge proposals would have no effect on bald eagles or their habitat. The bald eagle habitat area adjacent to unit D-1 is fully contained within and protected by the Riparian Reserve. Bald eagles have never been observed in the Turnridge area.
- 3) Bureau Sensitive, SEIS Special Attention, and Other Species of Concern

### **Effects Common to Thinning and Partial Cut Harvest Units, TM Alternatives A and B**

- In the short term, retention of existing snags and CWD would reserve habitat for primary excavators, amphibians and bat species. Direct adverse impacts to snags and CWD due to logging could have short-term adverse impacts on these species. Impacts to existing CWD and snags are expected to be greatest in units B-1, B-2, C-2 and portions of D-1 where most of this type of material is found.
- Minimal micro-habitat drying is anticipated to occur as forest stand canopies are opened up.
- In the long term, green tree retention, snag creation and additional CWD recruitment would contribute to habitat for primary excavators, amphibians and bat species in future stands.
- Riparian Reserves would adequately protect aquatic amphibians and provide protection for bats, which forage over open water and in riparian areas.
- The change in stand structure may provide additional foraging and breeding habitat for the olive-sided flycatcher, which benefits from opening the overstory with green tree retention and understory development.
- Reducing canopy closure below current levels with thinning and partial cut harvest would degrade marginally suitable habitat for goshawks. This would affect 86 acres under TM Alternative A or 154 acres under TM Alternative B.

### **Effects Specific to Regeneration Harvest Units, TM Alternative A**

- 81 acres of mature forest habitat that is marginally suitable for goshawks would be converted to seedling stage plantation, which is unsuitable as nesting habitat for goshawks.
- Micro-habitat drying and direct impacts to existing snags and CWD due to logging and site preparation are anticipated to be greater than with a partial cut harvest. This could result in impacts to primary excavators, amphibians and bat species within the boundaries and immediately adjacent to the edges of the harvest units.
- In the long term, green tree retention, snag creation and additional CWD recruitment would contribute to habitat for primary excavators, amphibians and bat species in future stands.

### **Effects on Red Tree Voles**

- No effects to the inhabitants of the ten red tree vole nests (8 active, 2 inactive) located during surveys of the Turnridge area are anticipated since none of the proposed harvest units is within a ten acre habitat reserve nor within one site potential tree height of a nest.
- Both regeneration harvest and partial cut harvest would reduce canopy closures below 60 percent, which would result in a loss of suitable habitat for any red tree voles in and adjacent to those harvest units, which were not detected by surveys.
- Riparian Reserves and areas not harvested would continue to provide habitat for red tree voles in the vicinity of the proposed harvest units.

### **Effects on Survey and Manage Mollusks**

- Protections buffers for known sites of *Megomphix hemphilli* (MEHE) would maintain micro-habitat and persistence.
- There may be a loss of habitat for undetected mollusks. Additional CWD created as part of timber harvest operations under TM Alternatives A and B and shade from retained trees would provide shade and microclimates, which would assist mollusk species to persist.

### **c) Cumulative Effects on Late Successional Habitat**

- Harvest plans included in the proposed action (TM Alternative A) and other potential harvest of late successional forest stands would not reduce late successional forest habitat below the 15 percent guideline in the Middle North Santiam Watershed or the combined sub-watersheds basins affected by the proposed action.
  - o Harvest of 167 acres of late successional forest under the proposed action would reduce the percentage of late successional forest habitat in the Middle North Santiam Watershed from 38 to 36 percent.
  - o Up to 140 additional acres of late successional forest could be harvested in the Middle North Santiam Watershed under the proposed Moorehouse Gate and Cherry Mill projects, further reducing the late successional forest habitat to 34 percent.
  - o In the 11,000 acre total of the Snake, In Rock, Little Rock and Mad Creek sub-watershed basins (SWBs, seventh field watersheds), timber harvest under the proposed action and other foreseeable harvest would reduce late successional forest habitat from 25 to 23 percent.
- Commercially thinned and partial cut units would attain late successional forest habitat conditions in approximately 20-30 years as canopy closure increases, trees grow and understory layers develop.
- Regeneration harvest units would develop late successional forest habitat conditions over the next 70-80 years or more.
- There would be no net increase of open road densities as a result of this proposal.

### **d) Riparian Reserves**

- Riparian Reserves, established as described in Chapter 3, would provide undisturbed forest and riparian habitats to provide protection for aquatic systems (ACSO #1),

connectivity within and between watersheds (ACSO #2), maintain current species composition and structural diversity of plant communities (ACSO #8), and maintain habitat to support populations of native plant and animal species (ACSO #9).

**e) Fisheries**

- No significant adverse effects to fish populations or habitat would be anticipated. The Riparian Reserves and other design features would be adequate to protect the aquatic and riparian habitat and all fish species within the project area and the North Santiam River.
- The ESA Section 7 Consultation with NOAA Fisheries for the proposed Turnridge projects is in progress. The Willamette Province Level 1 Team in accordance with the Streamlined Consultation process will review a draft Biological Assessment.
- The effect determination for ESA listed fish is “may affect, not likely to adversely affect” Upper Willamette River Chinook salmon and steelhead trout. The Biological Assessment will be submitted to NOAA Fisheries. A final decision on the proposed Turnridge projects would not be made until a letter of concurrence is received.

**5. Fire and Fuels**

- Fuel loadings after timber harvest in the partial cut units would be approximately 20-30 tons per acre, most of which would be branches less than three inches in diameter. This results in a low to moderate hazard of wildfire.
- Fuel loadings after timber harvest (and before site preparation) in regeneration harvest units would be approximately 45-65 tons per acre with a high percentage of it in branches less than three inches diameter. This results in a moderate to high hazard of wildfire.
- Fuel loadings after site preparation by broadcast burn or pile and burn operations would be approximately 20-30 tons per acre, very little of which would be less than three inches diameter. This results in a low hazard of wildfire.
- Fire use, when most of the duff layer is saturated and 1000 hour fuel moistures are greater than 30 percent, should not reduce the duff layer over a majority of the area. Nutrient cycling processes would continue and nutrients released from burning woody material would be utilized.
- Hazard of escaped fire during broadcast burning would be kept low by preventive measures (e.g. fire trails, foam pre-treatment) and adhering to the prescription.
- There is little threat of hold-over fire after mop-up is completed since the existing CWD component is low to non-existent.
- Preventive measures, adhering to the prescription, and lighting plans tailored to conditions at the time of ignition would prevent killing more than the acceptable number of retained green trees with burning operations.

## 6. *Visual, Recreation and Rural Interface Resources*

### a) **Visual Resources**

#### 1) No Action Alternative

- With the exception of unexpected changes (wildfire, disease, severe windstorm, etc.), no changes in visual features would be expected on the proposed units.
- Modifications to the viewshed in this area would still be expected as a result of harvest activities on State and private lands.

#### 2) Regeneration Harvest Units in TM Alternative A, the Proposed Action

- Changes in contrast for land and structure features are expected to be low.
- Changes in the regeneration harvest units would show the greatest degree of contrast. The size, nature, texture and color of the vegetation would change markedly and quickly at harvest, then change slowly over time.
- Some days with decline in visual quality from smoke created by burning (broadcast and piles) would be expected, but within the standards set by State smoke management regulations.

#### 3) Partial Cut and Thinning Units in Both TM Alternatives A and B

- These units would retain enough of the canopy to still appear relatively natural.
- Some changes in color and texture may be observable.
- Retention levels lower than 50-60 trees per acre would exhibit some of the visual changes of regeneration harvest units.

#### 4) Summary

- Implementing the proposed action would result in changes to the visual character of the area's forested landscape. The changes would not be expected to dominate the view of the casual observer.
- Implementing TM Alternative B would result in changes to the visual character of the area's landscape, but would likely be less than that described for the proposed action. The changes would not be expected to dominate the view of the casual observer.

### b) **Recreation Resources**

- Removal of most of the trees/forest canopy on units proposed for regeneration harvest would most likely make the units undesirable to those seeking a forested setting. As the stands mature in the long term (50-60 years), they may again become more desirable to those seeking a forested setting.
- The openness of regeneration harvest units may be desirable to those seeking a more open setting, scenic vistas, undeveloped campsites on landings, and hunters.
- Partial cut units where final retention falls below approximately 60 trees per acre would be less desirable than other stands in the area for those seeking a forested setting. Understory growth after harvest would make these stands more natural appearing in a few years.

- Partial cut units and commercial thinning units where 80 trees per acre or more are retained would still offer a relatively natural forest setting, though some disturbance to vegetation would be evident. Stands with this level of retention should be more natural appearing within five years as the vegetation grows in on disturbed areas and fills in new openings.

**c) Rural Interface Resources**

- Log truck traffic on haul routs and Kingwood Avenue would increase and nearby residences my experience increases in noise and dust associated with it.
- Nearby residences may experience some short duration (days) increase in smoke associated with broadcast or pile burning on regeneration harvest units.
- Weekend and holiday restrictions on hauling would reduce disturbance to residences when families are likely to be at home.

**C. EFFECTS OF PROJECT 2, RIPARIAN RESERVE TREATMENT**

**1. Soils**

- No soil would be disturbed or compacted. No effects are expected.

**2. Hydrology and Water Quality**

- No sediment would be introduced into any stream since no soil would be disturbed.
- No increase in water temperature would be expected from the treatments since changes to canopy closure would be limited to small areas selected specifically so that they would not alter the shading of streams.

**3. Vegetation**

- Structural diversity, including tree size, tree form (wolf trees), tree spacing, understory development, snags and coarse woody debris (CWD), would be developed more quickly than they would develop naturally without this treatment.
- Snags and CWD would be increased immediately as a result of treatment.

**4. Aquatic Conservation Strategy Objectives**

- The scale of these projects is too small to have significant effects on ACS objectives at a landscape level.
- On a local area level, they would add diversity to help restore come complexity to simplified Riparian Reserve stands (ACSO # 1), strengthen within-watershed connectivity (ACSO #2), and help restore some structural diversity currently lacking on these sites (ACSO #8).

**5. Wildlife**

- The structural diversity and wolf tree characteristics developed by the treatment would benefit wildlife species that use these habitats. This diversity would increase with time.

- There would still be an abundance of habitat in the immediate vicinity with the characteristics of the existing stand.

## **6. *Visual, Recreation and Rural Interface Resources***

- No potential effects to these resources were identified.

## **D. CONFORMANCE WITH LAND USE PLANS, POLICIES, AND PROGRAMS**

The proposed action and associated alternatives, unless otherwise noted, are in conformance with the following documents that provide the legal framework, standards, and guidelines for management of BLM lands in the Cascades Resource Area:

- *(RMP) Salem District Record of Decision and Resource Management Plan, May 1995, pp. 5-6 (ACS objectives), 9-15 (Riparian Reserves), 28-32 (Special Status/Attention Species and Habitat), 36-37 (Visual Resources), 42 (Socioeconomic Conditions), 64-67 (Noxious Weeds; Fire/Fuels Management), Appendix C (Best Management Practices).*
  - o ACS Objectives and Riparian Reserves: All alternatives are predicted to result in the maintenance of ACS objectives.
  - o Special Status/Attention Species and Habitats: Required surveys have taken place for Special status /special attention species (including Surveys for Appendix B-1 “Survey and manage (S&M) Species” and “protection buffers” species). All alternatives are predicted not to result in a trend toward federal listing, loss of population viability, or elevation of status to any higher level of concern.
  - o Visual Resources: All alternatives are consistent with the visual resource management objectives.
  - o Socioeconomic: The action alternatives provide social and economic benefits to local communities through the supply of timber to local mills and contract work associated with the project. The no action alternative appears not to be in conformance because it does not contain a provision for the supply of timber or contract work that could contribute to the local economy.
  - o Invasive Plant Species: All alternatives are predicted to avoid increasing noxious weeds beyond controllable levels.
  - o Fire/Fuels Management: TM Alternatives A and B contain fuel management activities (i.e., slash at landings would either be made available for public firewood removal permits or burned) that would adhere to smoke management/air quality standards and meet ACS objectives.
  - o Best Management Practices: TM Alternatives A and B contain applicable Best Management Practices described in the RMP, Appendix C, to maintain water quality and reduce impacts to soil productivity while meeting other resource management objectives.

- (RMP/FEIS) Salem District Proposed Resource Management Plan/Final Environmental Impact Statement, September 1994.
- (SEIS/ROD) 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. The RMP was designed to be consistent with the SEIS/ROD and incorporated the analysis in the SEIS (RMP p.3).
- (SEIS) Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl, February 1994.
- (FEMAT) Forest Ecosystem Management: An Ecological, Economic, and Social Assessment: Report of the Forest Ecosystem Management Assessment Team, July 1993.
- (SM/ROD) Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and Other Mitigation Measures Standards and Guidelines, January, 2001. Alternatives 2 and 3 follow survey protocols described in the SM/ROD.
- (SM/FEIS) Final Supplemental Environmental Impact Statement for Survey and Manage, Protection Buffers, and Other Mitigation Measures in the Northwest Forest Plan, November 2000.
- (IM OR-2002-064) 2001 Survey and Manage Annual Species Review, June 2002. Alternatives 2 and 3 follow direction described in this document.

## **EA CHAPTER V - CONSULTATION**

***ESA Consultation: Wildlife*** - Section 7 Consultation with the United States Fish and Wildlife Service (USFWS) is in progress. The Turnridge timber sale was submitted on September 3, 2002 as part of the Biological Assessment (BA) addressing fiscal year 2003-2004 habitat modification projects within the Willamette Province. A final Biological Opinion is still pending on this consultation. The northern spotted owl has been observed in the vicinity. No other threatened or endangered plants or animals were observed in the area. This project “may affect, likely to adversely affect” the spotted owl, according to the criteria described in the BA (p.33-36). The proposed timber sale area is not located in Critical Habitat for the spotted owl. The design features of the project specify that there would be a seasonal restriction during the critical nesting season from March 1 – July 15. All applicable terms and conditions from the anticipated Biological Opinion would be incorporated into the project design features.

*Fish:* : ESA Section 7 Consultation: A Biological Assessment for the project was submitted to and accepted by the Upper Willamette Province Level I Team on June 13, 2002 in accordance with the Streamlined Consultation process.

The effect determination for ESA Fish is “may affect, not likely to adversely affect” Upper Willamette River chinook salmon or steelhead trout. The biological assessment has been submitted to the National Marine Fisheries Service (NMFS) and a letter of concurrence from NMFS is anticipated. A final decision on this action would not be made until a letter of concurrence is received from NMFS.

***City of Salem:*** Representatives of the City of Salem Water Department participated in the planning process for this project. They attended most interdisciplinary team meetings and provided input with regard to the City’s concerns about their municipal watershed.

***Other Consultation:*** State, local, and tribal interests were given the opportunity to participate in the environmental analysis process. In compliance with NEPA, the project was listed in the September 2001, March 2001, December 2000 and September 2000 editions of the quarterly *Salem District Project Update* which were mailed to over 1,000 addresses. Results of Scoping are described in Chapter 1.

## EA CHAPTER VI - LIST OF PREPARERS

<b>Table 5. List of Preparers</b>	
<b>NAME</b>	<b>RESOURCE</b>
Keith Walton	Project Leader
Marilyn Lowery	Special Status/Special Attention Plant Species and Noxious Weeds
Colin Rabe	Silviculture
Jim England	Wildlife
Dave Roberts	Fisheries
John Caruso	Soils and Cultural Resources
Patrick Hawe	Hydrology
Keith Walton	Logging Systems
Dave Rosling	Riparian Ecology
Sam Caliva	Fuels, Fire Ecology
Laura Graves	Recreation and Visual Resources
Steve Ditterick	Roads and Engineering
Pete Hazen	Cultural Resources
Hank Wujcik and Steve Sagmiller	Water Quality - City of Salem

## EA CHAPTER VII - APPENDICIES

### A. APPENDIX A - ELEMENTS OF THE ENVIRONMENT

The following table lists the critical elements of the environment that are subject to requirements specified in statute, regulation, or executive order and the interdisciplinary team’s predicted environmental impact per element if the project described in Chapter 2 of the Environmental Assessment was implemented.

**Table 6. Critical Elements of the Environment**

Critical Elements of the Environment	Affected/Not Affected/NA (not present within the project area)	Interdisciplinary Team’s Comments
Air Quality	Affected	The major sources of potential air pollutants associated with the project are smoke from prescribed burning (e.g., burning of landing debris if determined to be a fire hazard), and dust from the use of unsurfaced roads and road maintenance (Salem District Resource Management Plan Final Environmental Impact Statement, p. Chapter 4-8). The proposed haul route (e.g., Little North Santiam County Road) is primarily paved with only a few miles of gravel or natural-surface roads. The project area is not within an Oregon Smoke Management designated area. Since burning would be conducted in accordance with the <i>Oregon State Implementation Plan</i> and <i>Oregon Smoke Management Plan</i> , the impact of smoke on air quality is predicted to be local and of short duration. Dust created from vehicle traffic on gravel or natural-surface roads, road maintenance, and logging operations is predicted to be localized and of short duration. As such, the project would have no adverse impact on air quality and would comply with the provisions of the Clean Air Act.
Areas of Critical Environmental Concern	NA	There is no ACEC located within the project area.

Critical Elements of the Environment	Affected/Not Affected/NA (not present within the project area)	Interdisciplinary Team's Comments
Cultural, Historic, Paleontological	Not Affected	There are no known cultural sites located within the project area. The proposed project was surveyed for cultural sites in Spring 2001 in accordance with Survey Techniques for Densely Vegetated Areas of Western Oregon pursuant to the August 1998 Protocol for Managing Cultural Resources on Lands Administered by the BLM in Oregon, Appendix A. No sites/historic properties were identified as a result of this survey. If during the implementation of the project cultural resources are found, the project may be redesigned to protect the cultural resource values present, or evaluation and mitigation procedures would be implemented based on recommendations from the District Archaeologist.
Environmental Justice (Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations, 2/11/94)	Affected	The Turnridge project would yield between approximately 1.9 and 4.2 million board feet of merchantable timber over a three-year period. Additionally, considering the information contained in Chapter 4 of the EA, the project is not anticipated to have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.
Flood Plains	Affected	See section IV.B.2.b) & c) of the EA
Hazardous or Solid Wastes	Not Affected	No environmental effects associated with this element are expected due to the implementation of the Best Management Practices contained in the <i>Salem District Resource Management Plan</i> and the terms/conditions of the timber sale contract, including section 26 (refuse control and disposition of waste material), section 27 (storage and handling of hazardous waste), and section 28 (safety and health). Failure to comply with the terms and condition of the timber sale contract can result in violations, suspension or cancellation of the contract per section 10.
Invasive, Nonnative Species (includes Executive Order 13112, Invasive Species, 2/3/99)	Affected	See section IV.B.3.d) of the EA
Native American Religious Concerns	Not Affected	Tribes were contacted during scoping and no Native American religious concerns were identified
Prime or Unique Farm Lands	NA	There are no prime or unique farm lands located within the project area.
Threatened or Endangered Plant Species or Habitat	Not Affected	No threatened or endangered plant species or habitat are located within the project area.

<b>Critical Elements of the Environment</b>	<b>Affected/Not Affected/NA (not present within the project area)</b>	<b>Interdisciplinary Team's Comments</b>
Threatened or Endangered Wildlife Species or Habitat	Affected	See section IV.B.4.b) of the EA
Threatened or Endangered Fish Species or Habitat	Affected	See section IV.B.4.d) of the EA
Water Quality (Surface and Ground)	Affected	See sections IV.B.2 of the EA.
Wetlands/Riparian Zones (Executive Order 11990, Protection of Wetlands, 5/24/77)	Affected	See sections IV.C.2. of the EA
Wild and Scenic Rivers	NA	There is no wild and scenic river located within the project area.
Wilderness	NA	There is no wilderness located within the project area.

<b>Table 7. Other Elements of the Environment</b>		
<b>Elements of the Environment</b>	<b>Affected/Not Affected/NA (not present within the project area)</b>	<b>Interdisciplinary Team's Comments</b>
Adverse Impacts on the National Energy Policy (Executive order 13212)	NA	This project does not propose any activities related to energy development, production or distribution.
Bureau Sensitive and Special Attention Plant Species/Habitat (including Survey and Manage, and protection buffer species)	NA	The project area was surveyed for all species for which surveys are required.  See section III.A.3.b) of the EA
Bureau Sensitive and Special Attention Wildlife Species/Habitat, (including Survey and Manage)	Affected	See section IV.B.4.b) of the EA
Fish Species with Bureau Status	Affected	See section IV.B.4.d) of the EA
Land Uses (including mining claims, mineral leases, etc.)	NA	There are no known mining claims, mineral leases, etc. located within the project area.
Unmapped LSRs		The project is less than one mile away from the closest Unmapped LSR. Seasonal restrictions protect possible nesting owls.
Owl Core Area (OCA)	Suitable habitat within OCA	The project is less than one mile away from the closest Owl Core Area.

<b>Table 7. Other Elements of the Environment</b>			
<b>Elements of the Environment</b>		<b>Affected/Not Affected/ NA (not present within the project area)</b>	<b>Interdisciplinary Team's Comments</b>
	Suitable habitat within OCA		The project does not include any activity within an owl core area.
Minerals		NA	The project does not include the extraction of any mineral resource. As such, this element will not be affected by the project.
Recreation		Affected	See section IV.B.6.b) of the EA
Rural Interface Areas		Affected	See section IV.B.6.c) of the EA
Special Areas (Adjacent or within)		NA	This project does not propose any activities within or adjacent to Special Areas.
New Structures at Stream Crossings			If applicable, mitigation measures include
Soils		Affected	See section IV.B.1. of the EA
Visual Resources		Affected	See section IV.B.6.a) of the EA
Water Resources		Affected	See section IV.B.2. of the EA

**B. APPENDIX B – AQUATIC CONSERVATION STRATEGY (ACS) OBJECTIVES**

<b>Table 8. Documentation of the Turnridge Project’s Consistency with the Four Components of the Aquatic Conservation Strategy</b>
<p><b>Component 1 - Riparian Reserves:</b></p> <p>No timber extraction would take place within Riparian Reserves. The following activities would take place within Riparian Reserves: Falling, girdling and topping of trees to create or enhance CWD and structural complexity in forest stands simplified by past management practices.</p>
<p><b>Component 2 - Key Watershed:</b> Not affected. The Turnridge Projects would not be in a Key Watershed.</p>
<p><b>Component 3 - Watershed Analysis:</b> Name of Watershed Analysis and Date Completed. The Middle North Santiam River Watershed Analysis is still being developed.</p> <p>Describe project’s relationship to concerns identified in the WA. Not known.</p>
<p><b>Component 4 - Watershed Restoration:</b> Riparian Reserve treatment described in Component 1, above, would contribute to restoring complexity within the Riparian Reserve.</p>

**Table 9. Documentation of the Turnridge Project’s 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.**

*No Action Alternative:* 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.**

*TM Alternative A (Proposed Action) and B:* **Does not retard or prevent the attainment of ACS Objective 1.** Effects of the project on Aquatic Conservation Strategy 1 are described in section IV.B.4.d). of the EA under Riparian Reserves.

*Project 2:* **Does not retard or prevent the attainment of ACS Objective 1.** Restores complexity at a local level, maintains landscape scale features, as described in section IV.C. of the EA.

**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.**

*No Action Alternative:* The current condition of connectivity would be maintained. **Does not retard or prevent the attainment of ACS Objective 2.**

*TM Alternative A (Proposed Action) and B:* **Do not retard or prevent the attainment of ACS Objective 2.** Effects of the project on Aquatic Conservation Strategy 2 are described in section IV.B.4.d) of the EA under Riparian Reserves.

*Project 2:* **Does not retard or prevent the attainment of ACS Objective 2.** Maintains or restores connectivity at a local level, maintains connectivity at current levels on a landscape scale.

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

*No Action Alternative:* 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.**

*TM Alternative A (Proposed Action) and B:* **Do not retard or prevent the attainment of ACS Objective 3.** Effects of the project on Aquatic Conservation Strategy 3 are described in section IV.B.2. of the EA under Hydrology and Water Quality.

*Project 2:* **Does not retard or prevent the attainment of ACS Objective 3.** The nature and location of the treatment would not affect banks or bottom configurations.

**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.**

*No Action Alternative:* The current condition of water quality would be maintained. **Does not retard or prevent the attainment of ACS Objective 4.**

*TM Alternative A (Proposed Action) and B:* **Do not retard or prevent the attainment of ACS Objective 4.** Effects of the project on Aquatic Conservation Strategy 4 are described in section IV.B.2. of the EA under Hydrology and Water Quality.

*Project 2:* **Does not retard or prevent the attainment of ACS Objective 4.** The nature and location of the treatment would not affect water quality in the area.

**Table 9. Documentation of the Turnridge Project’s Consistency with the Nine Aquatic Conservation Strategy Objectives**

**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.**

*No Action Alternative:* The current condition of the sediment regime would be maintained. **Does not retard or prevent the attainment of ACS Objective 5.**

*TM Alternative A (Proposed Action) and B:* **Do not retard or prevent the attainment of ACS Objective 5.** Effects of the project on Aquatic Conservation Strategy 5 are described in section IV.B.2. of the EA under Hydrology and Water Quality.

*Project 2:* **Does not retard or prevent the attainment of ACS Objective 5.** The nature and location of the treatment would not affect the sediment regime of streams in the area.

**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.**

*No Action Alternative:* The current condition of in-stream flows would be maintained. **Does not retard or prevent the attainment of ACS Objective 6.**

*TM Alternative A (Proposed Action) and B:* **Do not retard or prevent the attainment of ACS Objective 6.** Effects of the project on Aquatic Conservation Strategy 6 are described in section in section IV.B.2. of the EA under Hydrology and Water Quality.

*Project 2:* **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.**

*No Action Alternative:* The current condition of floodplain inundation and water tables would be maintained.

**Does not retard or prevent the attainment of ACS Objective 7.**

*TM Alternative A (Proposed Action) and B:* **Do not retard or prevent the attainment of ACS Objective 7.** Effects of the project on Aquatic Conservation Strategy 7 are described in section in section IV.B.2. of the EA under Hydrology and Water Quality.

*Project 2:* **Does not retard or prevent the attainment of ACS Objective 7.** The nature and location of the treatment would not affect floodplain inundation or water tables in the area.

**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.**

*No Action Alternative:* The current condition of plant communities within riparian areas would be maintained. **Does not retard or prevent the attainment of ACS Objective 8.**

*TM Alternative A (Proposed Action) and B:* No harvest in Riparian Reserves along all streams (both perennial and intermittent) would maintain current species composition and structural diversity and their functions. **Do not retard or prevent the attainment of ACS Objective 8.** Effects of the project on Aquatic Conservation Strategy 8 are further described in section IV.B.4.d) of the EA under Riparian Reserves.

*Project 2:* **Does not retard or prevent the attainment of ACS Objective 8.** Maintains species diversity and restores structural diversity at a local level. See EA section IV.C.

**Table 9. Documentation of the Turnridge Project's Consistency with the Nine Aquatic Conservation Strategy Objectives**

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

*No Action Alternative:* The current condition of habitat to support riparian-dependent species would be maintained. **Does not retard or prevent the attainment of ACS Objective 9.**

*TM Alternative A (Proposed Action) and B:* Riparian Reserves along streams (both perennial and intermittent) would maintain the habitat for riparian-dependent species. **Do not retard or prevent the attainment of ACS Objective 9.** Effects of the project on Aquatic Conservation Strategy 9 are further described in section IV.B.4.d) of the EA under Riparian Reserves.

*Project 2:* **Does not retard or prevent the attainment of ACS Objective 9.** Maintains and restores elements of habitat, including CWD, snags and wolf trees. See EA section IV.C.

## C. APPENDIX C – GLOSSARY

**Aquatic Conservation Strategy (ACS)** - The Aquatic Conservation Strategy was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. The strategy would protect salmon and steelhead habitat on federal lands managed by the Forest Service and the Bureau of Land Management within the range of Pacific anadromy. Compliance with the nine Aquatic Conservation Strategy objectives means that an agency must manage the riparian-dependent resources to maintain the existing condition or implement actions to restore biological and physical processes within their ranges of natural variability.

**Coarse Woody Debris (CWD)** - The portion of a tree that has fallen or has been cut and left in the woods. Usually refers to pieces at least 20 inches in diameter. (SEIS/ROD p. F- 4)

**Commercial Thinning (CT)** – The removal of merchantable trees from an even-aged stand to encourage growth of the remaining trees.

**Culmination of Mean Annual Increment (CMAI)** - The age in the growth cycle of a tree or stand at which the mean annual increment (increase) for height, diameter, basal area, or volume is at a maximum.

**Decommission (Road)** - To remove those elements of a road that reroute hillslope drainage, and present slope stability hazards.

**Environmental Analysis** - A systematic process of developing reasonable alternatives and predicting the probable environmental effects of a proposed action and associated alternatives.

**Environmental Assessment (EA)**- A systematic analysis of site-specific activities used to determine whether such activities have a significant effect on the quality of the human environment and whether a formal environmental impact statement is required (RMP Chapter 6-4); a concise public document required by the regulations for implementing the procedural requirements of the National Environmental Policy Act (40 CFR 1508.9).

**Environmental Impact Statement** - A formal document to be filed with the Environmental Protection Agency that considers significant environmental impacts expected from implementation of a major federal action; a detailed written statement as required by section 102(2)(C) of the [National Environmental Policy] Act, as amended (40 CFR 1508.11).

**Finding of No Significant Impact** - A document by a Federal agency briefly presenting the reasons why an action, not otherwise excluded (40 CFR 1508.4), will not have a significant effect on the human environment and for which an environmental impact statement therefore will not be prepared (40 CFR 1508.13).

**Interdisciplinary Team (IDT)**- A group of environmental experts who conduct the environmental analysis.

**Land Use Allocations (LUA)** - All Federal lands covered by the Northwest Forest Plan are identified to be in one of seven designations called Land Use Allocations. The NFP (*SEIS/ROD*) and RMP describe what activities are allowed in each LUA.

**Large Woody Debris (LWD)** - Large logs or trees in contact or within streams to provide habitat for aquatic species.

**Issue** - A major point of discussion, debate, or dispute about environmental effects of the proposed action. For the purposes of the National Environmental Policy Act, an issue is a concern within the scope of a proposed action, which is used to formulate alternatives, develop mitigation measures, or is important in tracking effects.

**Matrix** - Federal Lands outside of reserves, withdrawn areas, and Managed Late-Successional areas. These areas are also expected to be available for timber harvest at varying levels. A federal (BLM and USFS) land allocation which is managed to meet several objectives including but not limited to, the production of a sustainable supply of timber and other forest commodities to provide jobs and contribute to community stability.

**National Environmental Policy Act (NEPA)** - The basic national charter for the protection of the environment. It establishes policy, sets goals (section 101), and provides means (Section 102) for carrying out the policy.

**No Harvest Zone** - That portion of a Riparian Reserve where no tree extraction would take place. Individual tree treatments such as top or base girdling, or felling to provide coarse woody debris or large woody debris could take place, where appropriate, to increase diversity in these stands and to contribute to Aquatic Conservation Strategy Objectives 1, 2, 8, and 9. In Riparian thinning units R6-R8, the no harvest zone is a minimum of 50 feet from both sides of intermittent and perennial streams. In units A-E, PQ, and R, the no harvest zone is defined by the site potential tree height for these stands (see Table 1).

**Partial Cutting** – Removal of selected trees from a forest stand.

**Riparian Reserves (RR)** - Riparian Reserves are LUAs that include those portions of a watershed directly coupled to streams and rivers. They occur at the margins of standing and flowing water, intermittent stream channels and ephemeral ponds, and wetlands. Riparian Reserves generally parallel the stream network but also include other areas necessary for maintaining hydrologic, geomorphic and ecologic processes.

**Scoping** - An ongoing process to determine the breadth and depth of an environmental analysis.

**Semi-Permanent Road** - Language used primarily by the National Marine Fisheries Service (NMFS) to indicate roads that will not be obliterated the same construction season that they were built. (see **temporary roads**)

**Snags** - Any standing dead tree.

**Temporary Roads** - 1/ (BLM definition) Roads constructed for a project that will be obliterated at the end of the same project. 2/ (NMFS definition) Roads constructed for a project that will be obliterated the same construction season that they were built.

## D. APPENDIX D - PUBLIC COMMENTS SUMMARY

81 comment cards, letters and petitions have been received on Turnridge project as a result of scoping. The comments are summarized in the following table.

**Table 10. Summary of Comments Received as a Result of Scoping.**

Tally		Concern Expressed	Additional notes
<b>Water Resources</b>			
15	29	Drinking Water	Specific mention of drinking water.
18		General water quality, clean water	
4		Fish/Fisheries	
6		Cumulative Effects	Catch-all includes transient snow zone (TSZ), flooding, activities on other ownerships, etc.
<b>Riparian Resources</b>			
10		Riparian Reserves	Some specifically mentioned fish or no fish, most were generic “Riparian Reserves”. Focus was on using the term “Riparian Reserves”.
5		Riparian Habitat	Focus on habitat or “riparian area”.
14		Small Wetlands	Specifically focused on in some campaigns.
<b>Upland Resources</b>			
71		“Don’t cut Old Growth”	Focus on use of words “Old Growth”
27		“Don’t cut Mature Forest”	Specific use of word “mature” in most cases. Sometimes it was just a clear concept. No one JUST opposed cutting mature forests without also specifically mentioning “old growth”.
31		Use of words such as “pristine”, “majestic”, etc.	
12		Recreation/Aesthetic	Specific mention, or something like “I will bring my family here for years to come”.
30		Wildlife Habitat	Use of word “habitat” or making it clear that habitat was the concern.
21		Wildlife Species	Mentioned individual species (RTV, owls, etc.) or classification such as “endangered species”, “species of concern”, etc.
???		“Clearcut”	Frequently used. Was not tallied separately until later in the process.

Tally	Concern Expressed	Additional notes
???	“80 years old”	This age is consistently used as a break point for “Don’t cut it”. Frequently used as the mark of “mature”, sometimes used in conjunction with “old growth”. Was not tallied separately until later in the process.
<b>Other</b>		
18	“No new roads”	
6	Spiritual values	Reference to spiritual values of the forest within the project area.
21	Public trust, BLM’s Role is to Protect	Sometimes specifically stated in comments, sometimes strongly inferred.

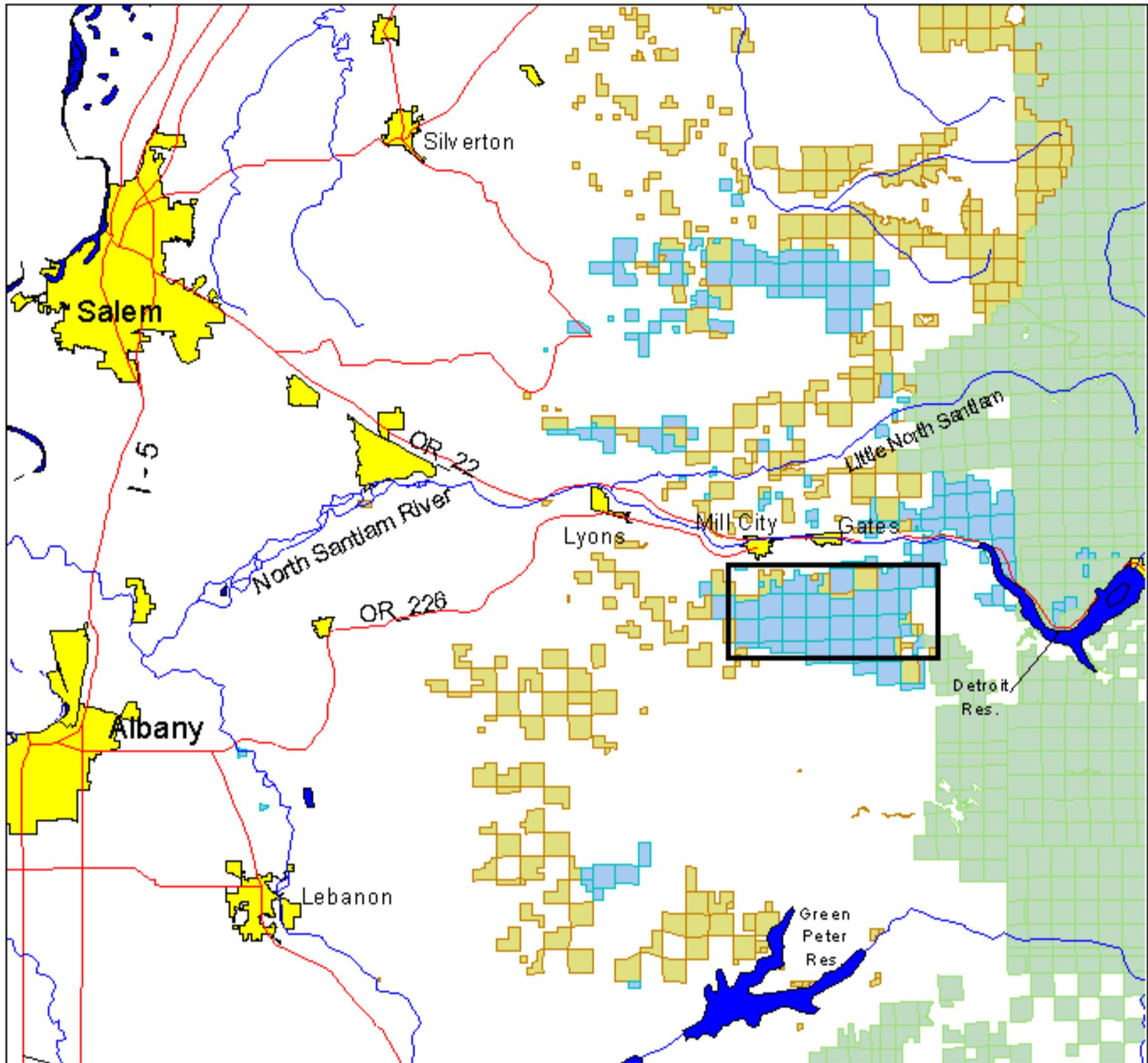
A Selection of Other Comments:

- S Use for public education,
- S Concentrate timber management on plantations, <80 years old. Find some “other place” to harvest timber.
- S Many correlated Old Growth with 80+ years old.
- S No “clearcutting” on public lands. Stop ALL logging on public lands.
- S Include a “Restoration Alternative”
- S Save the trees, don’t turn Oregon into California
- S Ground based logging degrades streams
- S Healthy forests helps ensure healthy water which helps ensure healthy fish and wildlife which helps ensure healthy people. Don’t allow cutting of forests.
- S Low elevation Old Growth is unique.
- S I will be ground truthing streams
- S your “drive to destroy...”
- S In the area are erodible soils with slumps and mass wasting.
- S Concerns over surrounding lands management - ODF and private industrial harvests.
- S Retaining Old Growth is not enough. Any harvest in this area will damage the ecosystem. Concentrate on 50-80 year old stands for timber harvest.
- S The forest will be destroyed by timber management
- S This area provides drinking water for “Salem and other Southern Oregon communities”. (Assumption: The geographic regions of Oregon are: Portland, Southern Oregon and Eastern Oregon.)
- S This “delicate ecosystem” takes “hundreds of years” to develop.

**E. APPENDIX E – MAPS**

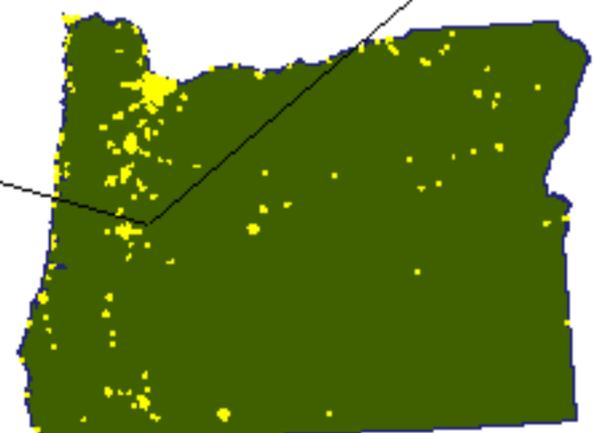
# Turnridge

## General Location Map



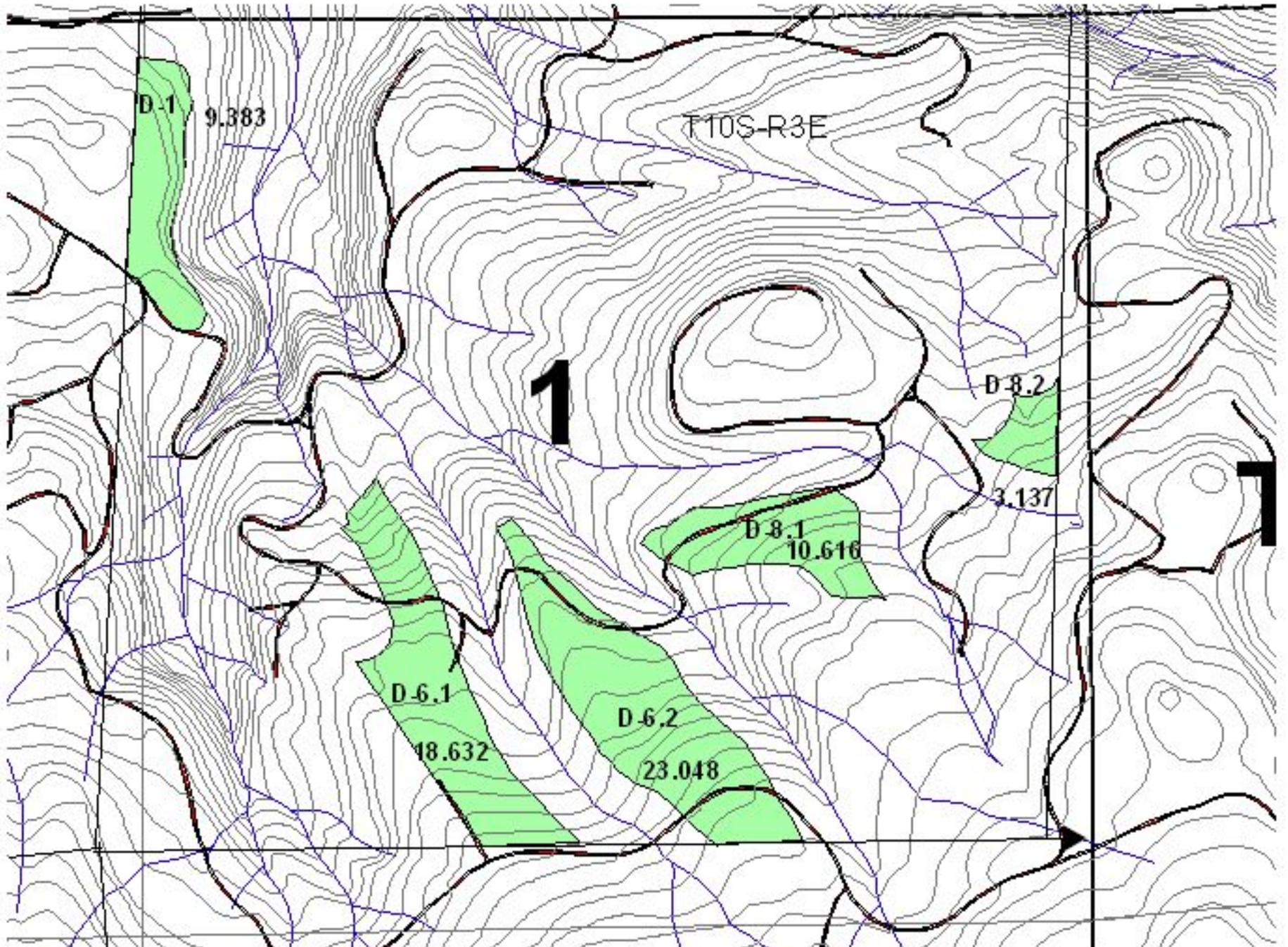
### Legend

- Rivers
- Lakes
- Roads
- City
- Public Ownership
  - BLM
  - USFS
  - State Forestry





# Turnridge Sec. 1



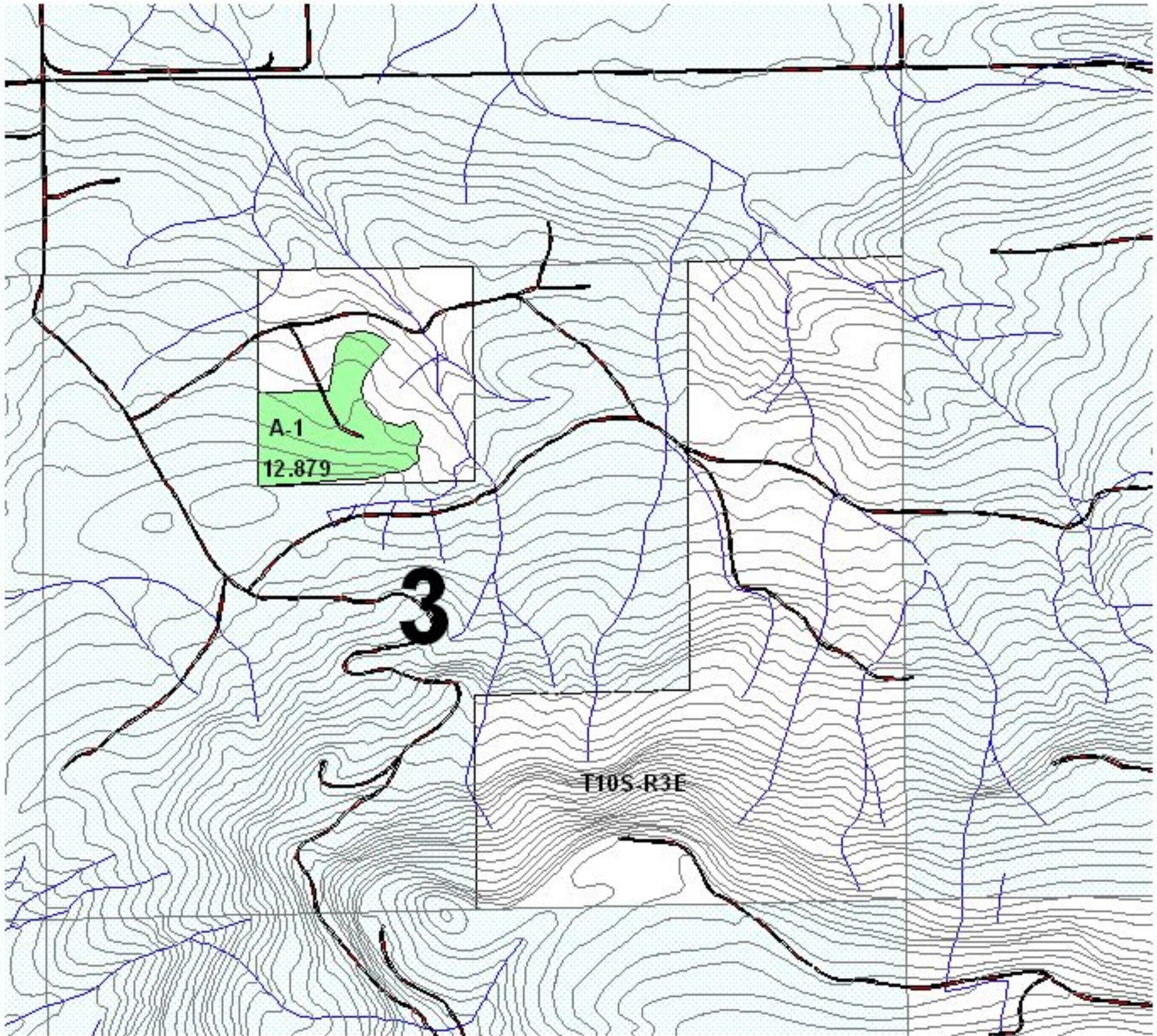
Unit_No.	Acres
D-1	9.383
D-6.1	18.632
D-6.2	23.048
D-8.1	10.616
D-8.2	3.137

- 20con.shp
- Addacsec11.shp.shp
- Road.shp
- Un b\_sec1.shp
- Stream.shp
- Townships
- Sections
- Cas\_11

1:12000



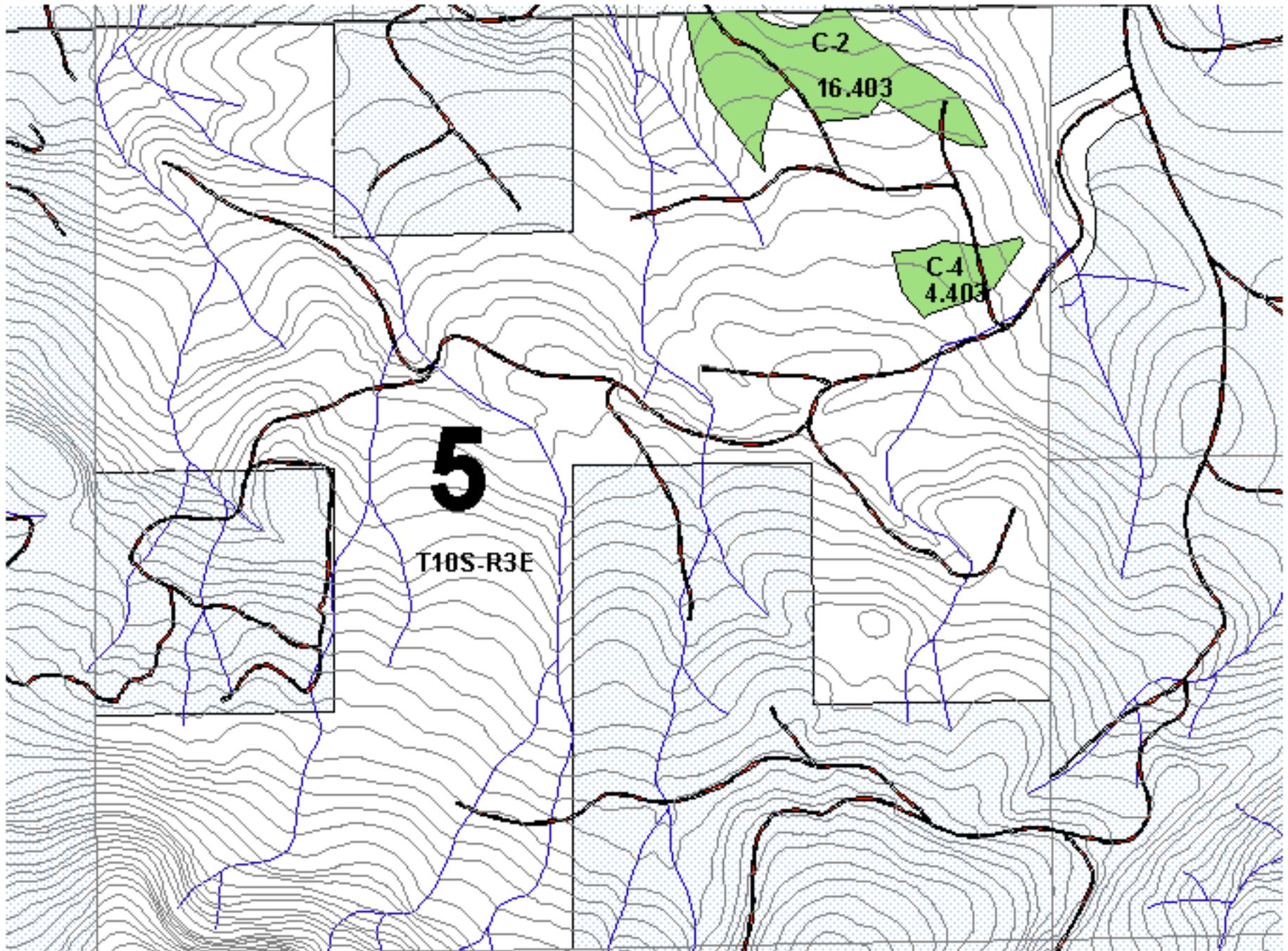
# Turnridge Sec. 3



- 20con.shp
- Road.shp
- Stream.shp
- Units\_sec3.shp
- Townships
- Sections
- Cas\_Ili
- Nonblmill.shp

Unit_No.	Acres
A-1	12.879

# Turnridge Sec. 5

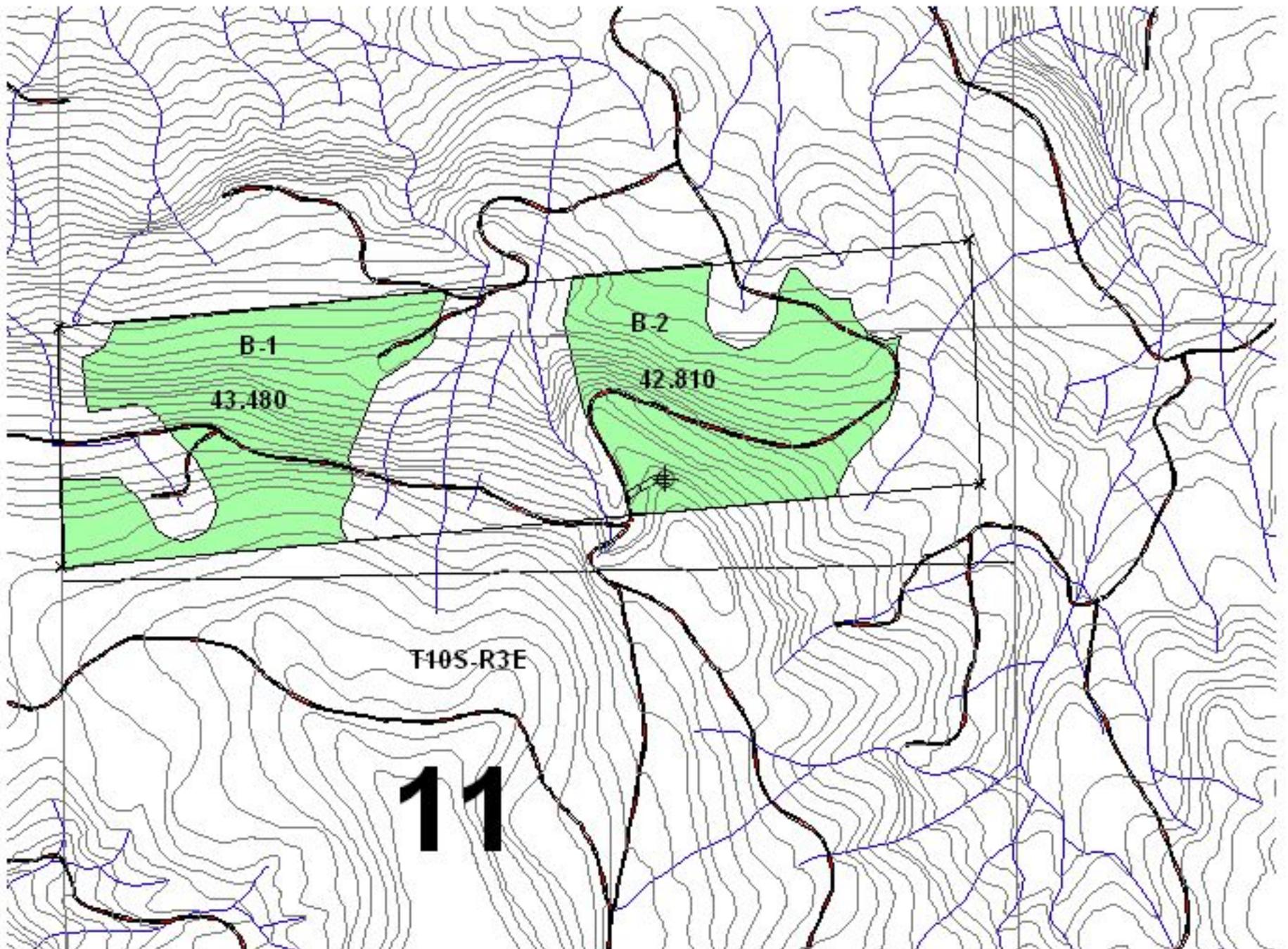


Unit_No.	Acres	
C-2	16.40	
C-4	4.40	

- 20con.shp
- Road.shp
- Unit\_sec5.shp
- Sections
- Stream.shp
- Townships
- Cs\_III
- Nonlm III.shp

1:12000

# Turnridge Sec. 11



Unit_No.	Acres
B-1	43.480
B-2	42.810

- 20con.shp
- Road.shp
- Newroad.shp
- Stream.shp
- Unitb\_sec11.shp
- Townsh ps
- Sections
- Cas\_11