CLEAR DODGER TIMBER HARVEST, ROAD MANAGEMENT AND RIPARIAN RESTORATION PLAN

FISCAL YEAR 2003
ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT

CASCADES RESOURCE AREA
SALEM DISTRICT OF BUREAU OF LAND MANAGEMENT

EA NUMBER: OR080-2003-03

PREPARED BY: Randall L. Herrin DATE: March 12, 2003

SUMMARY: The proposed Clear Dodger Timber Sale would remove approximately 1,600 thousand-board feet (MBF) of merchantable timber from 161 acres of land in accordance with the Salem District Resource Management Plan and the Northwest Forest Plan. The timber sale and related actions would involve harvesting trees by partial cut harvest prescriptions, temporary road construction, road decommissioning, road blocking and habitat restoration in the Riparian Reserve. The sale would be located in Sections13, 23, 24 & 25, T. 4 S., R. 4 E., Clackamas County, Oregon within the Upper Clear Creek and Lower Clackamas River Watersheds.

Responsible Agency: USDI - Bureau of Land Management

Responsible Official: William B. Keller, Acting Field Manager
Cascades Resource Area
1717 Fabry Road SE
Salem, OR 97306
(503) 375-5968

For further information, contact: Randall L. Herrin, Project Leader
Cascades Resource Area
1717 Fabry Road SE
Salem, OR 97306
(503) 315-5924

Table of Contents

FINDING OF NO SIGNIFICANT IMPACT ..... **IV**

ENVIRONMENTAL ASSESSMENT **1**

CHAPTER 1 - PROJECT SCOPE **1**

PROJECT LOCATION 1
PURPOSE OF AND NEED FOR ACTION 1
PROPOSED ACTION 2
DECISION TO BE MADE 3
ISSUES 3

CHAPTER 2 - ALTERNATIVES, INCLUDING THE PROPOSED ACTIONS **5**

NO ACTION ALTERNATIVE, ALTERNATIVE B 5
THE PROPOSED ACTION, ALTERNATIVE A 5
DESIGN FEATURES AND MITIGATION MEASURES 8
ALTERNATIVES DROPPED FROM DETAILED ANALYSIS 12

CHAPTER 3 – DESCRIPTION OF THE AFFECTED ENVIRONMENT **14**

TIMBER AND GENERAL VEGETATION 14
SOIL RESOURCES 14
WILDLIFE 17
RIPARIAN RESERVES 19
FISHERIES 20
HYDROLOGY 21
BOTANY 25
VISUAL RESOURCES 26
OTHER RESOURCES 27

CHAPTER 4 - ENVIRONMENTAL CONSEQUENCES **28**

TIMBER AND GENERAL VEGETATION 28
SOILS 28
WILDLIFE 30
RIPARIAN RESERVES 32
FISHERIES AND AQUATIC HABITAT 34
HYDROLOGY 34
BOTANY 44
VISUAL RESOURCES 45
CULTURAL RESOURCES 45
AIR QUALITY 46
RECREATION AND RURAL INTERFACE 46

CONFORMANCE WITH LAND USE PLANS, POLICIES, AND PROGRAMS **47**

CONSULTATION **47**

ADDITIONAL REFERENCES **48**

LIST OF PREPARERS/INTERDISCIPLINARY TEAM MEMBERS **49**

APPENDIX A - PROJECT DESIGN FEATURES 1

APPENDIX B: ENVIRONMENTAL ELEMENTS REVIEW SUMMARY 2

APPENDIX C - ENVIRONMENTAL CONSEQUENCES FOR AQUATIC CONSERVATION STRATEGY OBJECTIVES (ACSO'S) 3

APPENDIX D - SPECIAL STATUS/SPECIAL ATTENTION WILDLIFE SPECIES KNOWN & SUSPECTED 6

APPENDIX E - DETERMINATION OF EFFECT FOR LOWER COLUMBIA RIVER STEELHEAD TROUT, LOWER COLUMBIA RIVER CHINOOK SALMON AND UPPER WILLAMETTE RIVER CHINOOK SALMON 8

APPENDIX F - MAPS 12

FINDING OF NO SIGNIFICANT IMPACT

INTRODUCTION

The Bureau of Land Management has analyzed the potential effects of timber harvest in the Cascades Resource Area, Upper Clear Creek and Lower Clackamas River watersheds. The actions described in the Environmental Assessment (EA) for the Clear Dodger Timber Sale and related actions are proposed for the intent of meeting the need for forest products and forest habitat as described in the *Salem District Resource Management Plan* (RMP, 1995, pp. 1 and 2). The EA is attached to this Finding of No Significant Impact (FONSI) determination and is incorporated by reference.

The Finding of No Significant Impact, the proposal and associated design features described in the EA will be made available for public review prior to making a decision on the action. The public notice of availability for review will be published in a legal notice by local newspapers of general circulation and through notification of individuals, organizations, and state and federal agencies with affected interests.

Comments regarding this Environmental Assessment should be received by the Salem District Office by **May 2, 2003.**

Implementation of the proposed action would conform to management actions and direction contained in the ROD/RMP (*Salem District Record of Decision and Resource Management Plan*), dated May 1995, which is tiered to and incorporates the analysis contained in the RMP/FEIS (*Salem District Proposed Resource Management Plan /Final Environmental Impact Statement*), dated September 1994. The ROD/RMP provides a comprehensive ecosystem management strategy in conformance with the *Final Supplemental Environmental Impact Statement on Management of Habitat for Late-successional and Old-growth Related Species Within the Range of the Northern Spotted Owl* (February 1994), the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* and *Standards and Guidelines For Management of Habitat for Late-successional and Old-growth Related Species Within the Range of the Northern Spotted Owl* (April 1994).

Implementation of the Proposed Action would also conform with the *Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and Other Mitigation Measures Standards and Guidelines (ROD, January, 2001) and the Final Supplemental Environmental Impact Statement for Survey and Manage, Protection Buffers, and Other Mitigation Measures in the Northwest Forest Plan (FSEIS, November, 2000).*

Other documentation guiding this action include the:

- *Upper Clear Creek Watershed Analysis* (September 1995).
- *Lower Clackamas River Watershed Analysis* (1996)

The following shows how this action relates to required components of the Aquatic Conservation Strategy (RMP, p. 5 - 7):

Component	Component Relationship of This Action
Riparian Reserves	Strict adherence to Riparian Reserve guidelines as established on page 10 of the RMP, on pages 58 and 80 of the Upper Clear Creek Watershed Analysis and on page 6-3 of the Lower Clackamas River Watershed Analysis .
Key Watersheds	Neither the Upper Clear Creek watershed nor the Lower Clackamas River watershed is a Key Watershed (RMP p. 6).
Watershed Analysis	Watershed Analysis for the Upper Clear Creek watershed and the Lower Clackamas River watershed has been completed.
Watershed Restoration	Portions of the Riparian Reserves in the Upper Clear Creek watershed may receive treatments in order develop snags and large down woody debris, habitat features which are lacking in the area. Treatments would occur in several locations throughout the Riparian Reserves over the next several years.

Based upon review of the EA and supporting documents, I have determined that the Proposed Action (Alternative A) is not a major federal action and would not significantly affect the quality of the human environment, individually or cumulatively with other actions in the general area. No environmental effects meet the definition of significance in context or intensity as defined in 40 CFR 1508.27. Therefore, an environmental impact statement is not needed. This finding is based on the following discussion:

Context: Under this proposal the BLM would commercially thin approximately 161 acres of matrix lands. It is expected that this will yield 1,600 MBF. Approximately eight to sixteen trees per acre in the Riparian Reserve throughout the sections where timber harvest units are proposed would be felled, topped or girdled in multiple entries over several years to create snag, cull and CWD habitat without removing any of the trees. The timber harvest and related treatments would be located in Sections 13, 23, 24 and 25, T. 4 S., R. 4 E., W.M. in the Upper Clear Creek and Lower Clackamas River watersheds (see maps in Appendix F and Table in Appendix A). There would be approximately 2,000 feet of new road constructed, then decommissioned after use. Approximately 2,200 feet of existing rocked road would be decommissioned in the project area. Approximately 19,300 feet of existing road would be blocked to prevent vehicular access (Note: of this 19,300 feet, 14,700 feet are currently blocked or gated and would be opened to allow operations and then re blocked or gated.) All ground disturbing equipment would be cleaned prior to entry onto BLM lands to prevent the spread of noxious weeds.

The timber harvest would be located in Matrix lands as described in the *RMP*.

The purpose for the proposed actions described and analyzed in this Environmental Assessment (EA) is to contribute to fulfilling the legal mandates to manage BLM lands as described in the *Salem District Resource Management Plan* (RMP, 1995, p. 1, and 2):

- To contribute to meeting the need for a sustainable supply of timber and other forest products that would help maintain the stability of local and regional economies and contribute valuable resources to the national economy, on a predictable and long-term basis.

- To contribute to meeting the need for a healthy forest ecosystem.

- To manage BLM land in a way which meets the need to protect watersheds.

- To manage habitat for plant and animal species so that management activities do not preclude the recovery of a listed species nor contribute to the need to list a species under the Endangered Species Act (ESA).

The EA details the effects of the proposed action. None of the effects identified, including direct, indirect and cumulative effects, are considered to be significant and do not exceed those effects described in the RMP/FEIS.

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.** The beneficial and adverse effects of the proposed action are described in Chapter 4 of the EA, Environmental Consequences.

2. **The degree to which the selected alternative will affect public health or safety.** Public health and safety was not identified as an issue.

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 known historic resources. There are no park lands, prime farm lands, or wildernesses that would be affected by the proposed action. The sale area does not qualify for potential wilderness nor has it been nominated for an Area of Critical Environmental Concern.

4. **The degree to which the effects on the quality of the human environment are likely to be highly controversial.** The predicted effects are not highly controversial. A complete disclosure of the predicted effects of the proposed action is contained in the EA.

5. **The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.** The actions are local in nature; potential adverse impacts would be short-term. Impacts were determined based on research, observation, professional training, and experiences by an interdisciplinary team of natural resource specialists. Determining such environmental effects reduces the uncertainties to a level, which does not involve highly unknown or unique 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.** Portions of the proposed action would be located within the Riparian Reserve land use allocation, and management of that area would not retard or prevent the attainment of the ACS objectives (Appendix C). No hazardous materials or solid waste would be created in the sale area. No harvest of late-successional forest habitat would occur. There would be no reduction in the total amount of late-successional forest habitat on federal forestlands (RMP pg. 22) (EA 4).

7. **Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.** The interdisciplinary team conducted a cumulative effects analysis and no significant cumulative effects were predicted (EA Chapter 4.). The design features identified in the EA would assure that no significant site specific nor cumulative impacts would occur to the human environment other than those already addressed in the FEIS, SEIS, and FSEIS.

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 proposed action would not adversely affect districts, sites, highways, structures, or other objects listed in or eligible for listing in the National Register of Historic Places, nor would the proposed action cause loss or destruction of significant scientific, cultural, or historical resources (EA).

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.** No threatened or endangered plants or animals were observed in the area. This proposed action "may adversely affect" the spotted owl. "Take" was authorized and seasonal restrictions are included in the Proposed Action. The proposed timber sale would not affect critical habitat for the spotted owl. The Clear Dodger timber sale was submitted for Formal Consultation with U.S. Fish and Wildlife Service on 3 September 2002. Consultation was concluded in March 2003 (Service Log 1-7-03-F-0008). As a result of consultation, the U.S. Fish and Wildlife Service found that the sale would not likely jeopardize the continued existence of the spotted owl. A determination has been made that this project would have no effect on Lower Columbia River steelhead trout, Lower Columbia River Chinook salmon or Upper Willamette River Chinook salmon. Consequently, no consultation with NOAA Fisheries is required.

10. **Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.** The proposed action does not violate any known Federal, State, or local law or requirement imposed for the protection of the environment. The alternatives are consistent with other Federal agency and State of Oregon land use plans and with the Clackamas County land use plan and zoning ordinances. Any permit requirements associated with the implementation of this project would be obtained and complied with. Project design features would assure that potential impacts to water quality would be in compliance with the State of Oregon In-stream Water Quality Standards and thus the Clean Water Act. Additionally, the proposed action is consistent with applicable land management plans, policies, and programs.

Reviewed By: Carolyn Sands 5/25/03
Carolyn Sands, NEPA Coordinator Date

Approved By: William B. Keller Mar 31, 03
William B. Keller Date
Cascades Resource Field Manager, Acting

ENVIRONMENTAL ASSESSMENT

Chapter 1 - Project Scope

Project Location

The project is located approximately seven miles southeast of Estacada, Oregon, in Clackamas County, Sections 13, 23, 24 and 25, Township 4 South, Range 4 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 Upper Clear Creek and the Lower Clackamas River sixth field watersheds.[1]

The proposed project is located within both the General Forest Management Area (GFMA) portion of the Matrix and Riparian Reserve land use allocations (LUA), as identified within the *Salem District Record of Decision and Resource Management Plan* (RMP) dated May 1995. Although portions of the Lower Clackamas River Watershed have been designated as a key watershed, areas under consideration for this project are neither in nor are they tributary to designated Key Watersheds (RMP p. 6). These watersheds are part of the municipal watersheds for the Cities of Estacada, Clackamas, Milwaukee, Lake Oswego and other municipalities served by Clackamas River Water Providers.

Purpose of and Need for Action

Matrix Land Use Allocation – GFMA

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) (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, October 28, 2002).

Stands, which have not yet reached CMAI, may be managed to increase timber production or to achieve other management objectives in suitable stands where topography and road access are favorable (RMP p. 48).

[1] The reader may encounter some confusion with the names of the watersheds in this document. Some specialists refer to the fifth field watersheds and some to the sixth field watersheds. The Lower Clackamas 6th field is actually within the Middle Clackamas 5th field watershed. The Upper Clear 6th field lies within the Lower Clackamas 5th field watershed. Watershed analysis was done at the 6th field level.

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, and down logs.

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) Where other road-related resource problems have been identified (i.e. Garbage dumping, off road use, timber theft) road density should be reduced by closing minor collector and local roads. (RMP p 64)

Riparian Reserve Land Use Allocation

The purpose of Riparian Reserve Treatments are to

- Ensure attainment of Aquatic Conservation Strategy Objectives (RMP, p. 5-7)
- Contribute to restoring a well functioning ecosystem by acting to enhance and speed the development of certain attributes of stand structural diversity which are generally lacking in the Riparian Reserves. These include decadence, Class I dead wood, canopy gaps, and canopy layering.

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.

Proposed Action

Project 1 – Timber Management

The proposed action (Alternative A) includes commercial thinning of approximately 161[2] acres, creation of snag and coarse woody debris, road construction, road maintenance and renovation, and decommissioning the roads to be constructed.

Project 2 – Road Management

Repair, remove or replace road culverts that are not properly functioning, provide drainage to protect streams from sediment and minimize increases in sediment coming from roadways. Decommission roads that are no longer required for access or management. Control vehicle access by installing gates or by blocking roads.

Project 3 – Riparian Reserve Treatments

Habitat restoration treatments without wood removal would be accomplished independent of the timber sale within the Riparian Reserve throughout BLM ownership in the sections containing the proposed timber harvest units.

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.

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 September 4, 2002 to 23 potentially affected and/or interested individuals, groups, and agencies. Nine postcards and nineteen letters were received as a result of this scoping as of December 31, 2002. These letters are available for inspection in the project development file at the Salem District office. In addition, a representative of the Clackamas River Water Providers participated as a member of the Interdisciplinary Team (IDT) in planning meetings during the environmental analysis.

The following issues were raised by the IDT and/or by members of the public as a result of scoping.

Project 1 – Timber Management

Issue 1. Water Quality and Clackamas River Water Users

Concern was raised about the impacts on water quality by timber harvest and by road construction.

Design features and mitigation measures to protect water quality are incorporated into the proposed alternative and are described in Chapter 2.

[2] 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.

Issue 2. Social Factors – Public Access vs. Misuse of Lands

At issue is the right of the public to have access to publicly owned land and BLM's responsibility to protect those lands. The project area shows considerable signs of abuse in the forms of garbage dumping, off road vehicle use and timber theft.

Issue 3. Cumulative Effects of Logging

Several writers expressed concern about the cumulative effects of logging in the project area. The writer pointed out that the surrounding "private land is not protected and often show signs of recent logging and abusive logging practices." The writers stated that the land in the project area "would be put to better public use as preserved, unmanaged forest". To remove these lands from the Matrix Land Use Allocation goes far beyond the scope of the purpose and need of this document and cannot be addressed here. The cumulative effects of the proposal on the area will be addressed in Chapter 4, Environmental Effects.

Issue 4: Old Growth and Ecologically Important and Protected Species

The bulk of the letters received expressed concerns about adverse effects to Old Growth habitat and "ecologically important species and protected species." It is not part of this proposed project to harvest any stands of old growth timber. The areas identifiable as old growth stands would not be a part of any proposed action. In the areas proposed for thinning, thinning would be done from below, concentrating the cutting on the younger and smaller trees while leaving the larger dominant and many co-dominant trees. Surveys were done to protocol for all Threatened and Endangered species as well as all Survey and Manage species that were likely to exist within the project area. Effects of timber harvest on late-successional species are described in Chapter 4.

Issue 5: Steep Slopes

Some writers expressed concerns about harvesting timber on steep slopes. Although there are steep slopes in the vicinity of the project area, it is not part of the proposed action to harvest timber on them. Having said this, however, it must also be acknowledged that some areas within the proposed action are steeper than would be allowable for ground-based operations. Design features and mitigation measures to protect soils are incorporated into the proposed alternative and are described in Chapter 2. The effects of the proposed action will be addressed in the soils portion of Chapter 4, Environmental Effects.

Project 2 – Road Management

Issue 6: Roads

The current road density and the construction of any new roads were raised as an issue, as was concern over the amount of garbage dumping along existing roads. An alternative for no new roads and the obliteration of current roads was suggested, however this goes beyond the purpose and need identified for this action. Where roads are no longer needed for management or may not be needed for a significant period of time, closing or decommissioning will be considered.

Roads being used in conjunction with timber management activities associated with Project 1 would be handled through the timber sale contract. Roads not associated with timber management activities would be handled in an independent action.

Project 3 – Riparian Reserve Treatment

No issues were surfaced with regard to the habitat restoration treatments proposed for the Riparian Reserves.

Chapter 2 - Alternatives, Including The Proposed Actions

The required No Action Alternative, Timber Management Project Alternative and a Road Management Project presented in this section are analyzed in Chapters 3 and 4 of this EA.

No Action Alternative, Alternative B

The BLM would not implement any of the Clear Dodger 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 to the proposed action.

The Proposed Action, Alternative A

Project 1 - Timber Management

Within sections 13, 23, 24 and 25 in the GFMA Matrix LUA:

Thin 161 acres in eight units A-1, B-1, B-2, B-3, B-4, B-5, C-1, and D-1. Table 1 shows acres, stand type, age and silvicultural treatment by unit. Table 2 provides additional information about the proposed action.

Connected Actions:

Construct and decommission 2,000 feet of new temporary road construction in unit C-1 and D-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.

Table 1. Summary Table for Alternative A

Unit No.	EA Acres	Mapped Stand Type	Mapped Stand Age	Alternative A Partial Cut Harvest
T. 4 S., R. 4 E., Sec. 13				
B-1	18	D3=1920	83	Com. Thin (CT)
B-2	40	D3=1920	83	Com. Thin (CT)
B-3	10	D3=1940	63	Com. Thin (CT)
B-4	8	D3=1940	63	Com. Thin (CT)
B-5	5	D3=1920	83	Com. Thin (CT)
T. 4 S., R. 4 E., Sec. 23				
A-1	6	D3=1940	63	Com. Thin (CT)
	14	D3H3RC3=1915	88	Com. Thin (CT)
T. 4 S., R. 4 E., Sec. 24				
C-1	38	D3H3=1920	83	Com. Thin (CT)
T. 4 S., R. 4 E., Sec. 25				
D-1	22	D3=1914	88	Com. Thin (CT)
Total	**161**		**Weighted Average 81**	**Com. Thin (CT)**

Table 2. Comparison of Alternatives for Selected Parameters

PARAMETERS			**ALTERNATIVES**		
			No Action	**Alternative A (Proposed Action)** Commercial Thinning of Immature Timber	
Acres Treated (approximate)	Matrix	Regeneration Acres	0	**Units**	**Acres**
				None	0
		Commercial Thinning Acres	0	A-1, B-1, B-2, B-3, B-4, B-5 C-1, D-1	161
	Total Acres Treated		0	161	

PARAMETERS		ALTERNATIVES	
		No Action	**Alternative A (Proposed Action)** Commercial Thinning of Immature Timber
Approximate Green Trees per Acre after treatment	Commercial Thinning Units A-1, B-1, B-2, B-3, B-4, B-5, C-1, D-1	216	84-140
Canopy Closure	Commercial Thinning	77%	40 - 50%
Estimated Harvest Volume (MBF - thousand board feet)		0	1,600
Temporary Road Construction (feet) (would be decommissioned after operations)		0	2,000
Road Blocking (feet)		14,700	19,300

Project 2 – Road Management

Management of existing and future roads in the project area needs to be addressed because of the current road densities, the amounts of garbage dumping on public lands adjacent to roads, off road vehicle use and timber theft in the area.

- Approximately 2,200 feet of existing road would be decommissioned.
- Roads needed to remain in the transportation network and under the control of BLM would be either gated or closed depending on the type and amount of access required. Road closure devices adjacent to the Hillockburn Road would be designed to minimize visual impacts, although safety and effectiveness would be the primary design features.

Roads to be closed would be storm proofed prior to closure. This may include improving drainage and removing stream culverts.

Project 3 – Riparian Reserve Treatment

In the Riparian Reserves, all appropriate mature conifer timber types located within the sections containing the proposed harvest units, up to 8 snags per acre would be created from green conifer trees greater than 20 inches in diameter. Either base girdling, top girdling, or a combination of both treatments would be utilized to accomplish the task. The treated trees would be both clumped to create or expand existing canopy gaps to provide for enhanced understory development, and created individually across the landscape. Additionally, in Section 25 base girdling up to 8 green understory trees per acre to thin small areas out and allow for increased crown development would be done. This treatment would also be done in clumps that coincide with overstory tree girdling.

Tree selection would be designed to ensure that there would be no increase in water temperature from loss of existing tree shade. The treatments may be accomplished in two pulses spaced four years between treatments to minimize risk of potential Douglas-fir bark beetle damage to residual green trees. (Hostetler and Ross. 1996)

Design Features and Mitigation Measures

Project 1 – Timber Management

Soils

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.

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 2,000 feet of temporary road would be constructed, as part of this timber sale. New roads would be natural surface out sloped roads with good drainage structure. Roads would be of minimum width, typically 12-foot average running surface with 55-foot minimum curve radius and minimum clearing limits. New roads and landings 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, seeding and fertilizing, 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.
- Hauling would be restricted to conditions that would not contribute to erosion or sedimentation of streams. In general this would mean no hauling on unpaved roads during wet weather.

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 (generally July 1 through October 31) 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.

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:

- Limiting the number and spacing of yarding roads by use of lateral yarding.
- Limiting yarding road width.
- Locating 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.
- 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 dry soil conditions to minimize compaction and gouging. Very little downhill or sidehill yarding is anticipated.
- Using reserved green trees, or trees outside of the unit boundaries (including those in Riparian Reserves) for attaching cables.

Blocking Skid Roads

Access to skid trails would be blocked off to prevent off road vehicles (ORVs) from driving on them.

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.

Riparian Reserves

Table 3. Site Potential Tree Height By Unit.

A-1	B-1	B-2	B-3	B-4	B-5	C-1	D-1
180 feet	180 feet	180 feet	200 feet	180 feet	180 feet	180 feet	180 feet

Riparian Reserve widths are:

- One site-potential tree height for non-fish bearing streams and wet areas larger than one acre.
- Two site-potential tree heights for fish bearing streams. Fish Bearing Streams are adjacent to the south edge of unit A-1 and the southwest corner of unit D-1.

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 roads 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.

Tractor Skidding/Ground Based Logging Equipment

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

Skyline Yarding

- Waterbars would be installed on yarding corridors as needed to prevent excessive erosion, gullying 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.

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. Others are implemented to maintain or enhance complex forest stand structure, develop 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.

Residual Stand Protection, Partial Cut Harvest Units

In addition to seasonal restrictions to protect soil, water and wildlife resources, no falling, skidding or yarding would be allowed during the spring growing season (typically April 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.

Leave Trees in Thinning and Partial Cut Harvest Units

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.

Late-successional Forest

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

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.

Wildlife

Structure, Green Trees, Snags and Coarse Woody Debris

- 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. Retain existing large snags and down logs where feasible.
- Top up to two 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. In all units thin from below and maintain an average minimum of 40 percent canopy closure immediately after harvest to maintain spotted owl dispersal habitat.

Individual Wildlife Species

- **Spotted Owls:** Place seasonal restrictions on all felling, yarding, and road construction and decommissioning operations from March 1 – July 15 to minimize the risk of disturbance to nesting spotted owls. This seasonal restriction 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.

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.

Fire and Fuels

Wildfire Prevention

Trees would be directionally felled away from Hilllockburn Road in order to reduce the amount of slash adjacent to the road. In addition all activity fuels would be removed within 25 feet of Hillockburn Road.

Other Resource Protection

After harvest operations are completed landing debris would be piled, covered and burned.

Visual, Recreation, and Rural Interface Resources

Visual Resources

Care will be taken to minimize cutting within the first row of trees adjacent to the Hillockburn Road.

Rural Interface Resources

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

Other

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.

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.

Alternatives Dropped from Detailed Analysis

Project 1 – Timber Management

In addition to the No Action Alternative and the proposed action described above, the IDT considered 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.

Additional Harvest Units

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

Section 13

- Approximately 110 acres in the NW ¼ were dropped largely because the stand is still growing and thinning will be more appropriate in another ten years.
- Approximately five acres of 200-year-old timber were dropped in the NW ¼ because they are more suited as legacy trees when the adjoining stands are harvested.
- Cable thinning portions of the N ½ NE ¼ was considered but dropped because it would require additional road construction, would be highly visible from State Highway 224, would be on steep slopes directly above the North Fork Reservoir on the Clackamas River.

Section 23

Two units totaling 80 acres in the NE ¼ were dropped because the stands are well spaced and growing well. Thinning in these stands is recommended in approximately twenty years.

Section 25

Approximately 5 acres dropped due to Riparian Reserves for wetlands.

Regeneration Harvest

Regeneration Harvest was considered for unit B-2. This alternative was dropped after review of the stand exam data revealed that the stand has not yet reached culmination of mean annual increment and that thinning the stand now would result in maximizing total yield over the life of the stand.

Alternative – No New Road Construction

The potential effects of implementing the timber management action alternative without new road construction are within the scope of the alternatives analyzed. The Cascades Field Manager could essentially implement a no new road construction alternative by simply choosing to exclude those acres of thinning which would be logged from landings accessed by new roads. The proposed new roads would access approximately 16 acres of lands, which would otherwise not be thinned.

Alternative – Riparian Restoration

One proposed alternative was to decommission an existing road that accesses the southwest corner of Section 13, and to restore the riparian reserve where this road traverses it. This alternative was dropped because the road is still needed for future management. The proposed alternative was adjusted to include closing this road, removing the stream culvert and laying back the sides of the trench where the culverts is removed from to the angle of repose or less to allow the stream to be free flowing. When management access is needed in the future, it will be a road maintenance issue to replace the culvert.

Chapter 3 – Description of the Affected Environment

The following descriptions are the environmental features affected by timber harvest and associated activities. A documentation of no effect to resources where review is required by statute, regulation, or executive order is included in Appendix B. See BLM Manual, Sec. 1790, Appendix 5.

For All Units

Timber and General Vegetation

- Stand History - These are all natural stands of fire origin probably following a major stand replacement fire during the early 1900's. The ages range from 60 to 85 years old. Most of the older stands were been thinned in the mid 1970's. These were thinnings from below that removed about 5-6 MBF per acre. The younger stands have not been thinned and have no records of any past management.

- Stand Structure - Thinned Stands. The stands that have been thinned in the past are composed of predominately even-aged Douglas-fir mixed with western hemlock, western red cedar and red alder. Skid trails and stumps are still evident throughout. The overstory canopies are closing and they are ready for another thinning. They all have an understory development of western hemlock and western red cedar saplings and are beginning to show vertical structure. Remnant old growth Douglas-fir are few and scattered. Large snags and down logs are evident. Understory shrub layers are dominated by vine maple, salal and sword fern

- Stand Structure – Unthinned Stands. These stands are generally younger, more dense and predominately Douglas-fir. Canopies are closed and little understory tree regeneration is present. Again a few remnant old growth and large down logs may be present. Understory shrub layer is rather sparse but is still dominated by vine maple, salal and sword fern.

- Forest Health – The stands are vigorous and growing well. No insect or disease problems were noted.
- Late Successional Forest – Within the Lower Clackamas fifth field watershed 15 percent of the Federal forested lands are in a Late Successional Forest condition and are reserved from cutting. Within the Middle Clackamas River fifth field watershed 32 percent of the Federal forested lands are in a Late Successional Forest condition and are reserved from cutting.

Soil Resources

General Description Of Soil Characteristics:

The proposed timber sale is located within the Western Cascades physiographic region. It is in the Clear Creek and Clackamas River Watersheds. The soils on and surrounding proposed units are, generally, deep and well drained and formed in old alluvium and in colluvium. The soil map associations within the project area are all related by occurring on rolling hills and high terraces. These are cool soils (frigid) and formed in andesite and tuff at the foot of the mountains. Erosion on slopes greater than 65% can be a problem when these sites are disturbed.

The soils with the project area consist mainly of clay loams, silty clay loams and cobbly loams.

The major soil series within the project area are: Klickitat-Kinney complex, Molalla cobbly loam, Cottrell silty clay loam, McCully gravelly loam, Alspaugh clay loam and Aschoff-Brightwood complex.

The following **Table 4** summarizes some characteristics of these soil types:

Soil Series	**Units**	**Depth (Inches)**	**Slope (%)**	**Surface Rock Content (%)**	**Management Considerations**	**Douglas-fir Site Class/Site Index**
Alspaugh clay loam - 2D and 2E K=0.24; Erodability= low	B-5	60+	15-50	0-35	Medium runoff and moderate hazard of water erosion; permeability is moderately slow; moderate to severe equipment limitation; moderate seedling mortality and plant competition; slight wind-throw hazard; yarding on slopes >35% is main timber management concern.	Site Class III Site Index 150
Soil Series	Units	Depth (Inches)	Slope (%)	Surface Rock Content (%)	Management Considerations	Douglas-fir Site Class/Site Index
Aschoff-Brightwood complex - 6F K=0.10; Erodability= moderate	B-3, B-4	20-60+	60-90	20-55	Rapid runoff and severe hazard of water erosion; permeability is moderate to moderately rapid; slight to moderate seedling mortality and wind-throw hazard; severe equipment limitation; moderate plant competition; steepness of slope and susceptibility of soils to severe erosion and gullying are main timber management concerns.	Site Class III Site Index 130 to 150
Cottrell silty clay loam - 24B and 24C K=0.24; Erodability=low	A-1, C-1, D-1	40-60+	2-15	0	Slow runoff and slight hazard of water erosion; permeability is slow to very slow; moderate equipment limitation, wind-throw hazard and plant competition; slight seedling mortality; wetness of site is main timber management concern.	Site Class II Site Index 160
Klickitat-Kinney complex - 52D K=0.10; Erodability=low	C-1	40-60+	5-30	15-55	Medium runoff and moderate hazard of water erosion; permeability is moderate; slight wind-throw hazard; slight to moderate seedling mortality; moderate equipment limitation and plant competition; instability of soils, content of rock fragments and compaction hazard (if ground-based yarding equipment is used when soil is wet) are main timber management concerns.	Site Class III Site Index 144 to 150

Soil Series	Units	Depth (Inches)	Slope (%)	Surface Rock Content (%)	Management Considerations	Douglas-fir Site Class/Site Index
McCully gravelly loam - 58C, 58D, 58E K=0.20; Erodability=low	D-1	40-60+	2-50	0-10	Runoff is medium and hazard of water erosion is moderate to severe; permeability is moderately slow; slight seedling mortality and wind-throw hazard; moderate equipment limitation; severe plant competition; main timber management concerns are yarding on the steeper slopes (>35%) and competition from brush species.	Site Class II Site Index 162
Molalla cobbly loam - 60B, 60C, 60D K=0.24; Erodability=low	B-1, B-2, B-3, B-4, A-1, C-1	40-60+	2-30	0-45	Runoff is slow to medium and hazard of water erosion is slight to moderate; permeability is moderate; seedling mortality and plant competition are moderate; slight wind-throw hazard; slight to moderate equipment limitation; main timber management concerns are soil compaction (if ground-based equipment is used during wet soil conditions) and competition from brush species during regeneration.	Site Class III Site Index 150

From the above, the primary timber management concerns for these soil classifications are yarding on steep slopes, ground-based yarding during wet soil conditions, and competition from brush species during regeneration. Since cable yarding with at least one-end log suspension will be required on steep slopes, ground-based yarding will be restricted to dry soil conditions, and no regeneration harvest is proposed by this project, no adverse soil impacts would result from its implementation.

While all topographic aspects are represented in this timber sale, east and west are predominant. All units are located within the lower or middle 1/3 of the slopes and benches that radiate to the northwest from Goat Mountain down to the Clackamas River. Unit elevations range from 1340 feet A.S.L. (average sea level) to 2020 feet A.S.L.

Table 5: TPCC Codes and Narratives:

TPCC	Description	Location	Best Management Practices
RLR1 Suitable	Sites, generally moist, having, or will have, competing hardwood or brush species following timber harvest. These species can be treated using operational practices to meet or exceed minimum stocking levels.	A-1, B-1, B-2, B-3, B-4, B-5, C-1, D-1	Utilize broadcast burning following regeneration harvest; minimize soil disturbance from yarding; thin-out competing brush and hardwood species before they overtop conifers; reforest sites with shade-tolerant and larger than normal planting stock; utilize herbicides if this practice becomes viable in future.

Wildlife

Upland Wildlife Habitat

Remnants, Snags And Coarse Woody Debris (Cwd)

There are a few old growth remnant trees near the NE corner of Unit B-4, NE corner of Unit C-1, and scattered through and adjacent to D-1.

Generally there are very few snags (any size) and down logs. Most of the units were clearcut logged after burning during the first half of the century and were subsequently thinned in the 1970's.

Special Habitats

(Special habitats include meadows, talus slopes, cliffs, and wetlands).

General habitat surveys did not detect any special habitats within the proposed units.

Special Status, SEIS Special Attention, And Other Species Of Concern

See the attached Special Status/Special Attention Species list for habitat description and species occurrence in the vicinity of the proposal (Appendix D).

Federally Listed Species

Northern spotted owl: The Clear Dodger project area is a **mix of suitable and dispersal habitat** and is over one and one-half miles from the nearest known spotted owl site. There are no unmapped LSRs within the project area. The project area is all within the GFMA land use allocation.

Bald Eagle: Bald eagles have never been observed in the vicinity of the Clear Dodger project area. However, they may occur in the vicinity of the North Fork Reservoir of the Clackamas River.

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

Amphibian surveys were conducted concurrently with mollusk surveys. Four species were found, none of which are listed species.

Four species of bats, which are listed as Protection Buffer and/or Bureau Tracking species, could potentially be present in the project area. These species are associated with caves and mines, bridges, buildings, cliff habitat, or standing cull and snags with bark attached. General habitat surveys were conducted in the spring of 2002. No mines, caves, bridges, buildings or suitable cliffs were found. The closest known mine, actually two water pipe tunnels, are located adjacent to the South Fork of the Clackamas River approximately 1.5 miles from the project area. Therefore, there are no structures that would require buffer protection under this project. There are large snags and standing dead trees with bark attached in areas adjacent to the proposed units (primarily unit **D-1** and **B-5**) that might provide suitable habitat for bats.

The goshawk, a Bureau Sensitive species, prefers older forests with a dense canopy and generally located at higher elevations. The proposed units are located at low elevations. The habitat in the vicinity of the units is marginally suitable for goshawks. No goshawks have been observed in the Clear Dodger project area.

The olive-sided flycatcher, a Bureau Tracking species, utilizes snags and remnant green trees, which emerge above the canopy in forested areas, or in open areas with legacy trees. These taller trees are used for feeding perches and territorial display, but nesting occurs in smaller trees in the understudy. The species is uncommon and local throughout the resource area at all elevations.

Red Tree Vole

The Oregon red tree vole (RTV) is a Survey and Manage species, according to the NFP. It is generally thought to be associated with late successional forests, but has been observed using younger forests. The red tree vole resides in the forest canopy where it builds nests and feeding stations and almost exclusively dines on Douglas fir needles.

According to the Standards and Guides of the NFP, protocol surveys for this species must be completed prior to the design of all ground-disturbing activities that will be implemented in 1997 or later. Survey Protocol for the Red Tree Vole, dated February 18, 2000 and the subsequent Management Recommendations for the Oregon Red Tree Vole, dated September 27, 2000, provide guidance for surveys and management of known nest sites.

Surveys to protocol were conducted on all proposed units and 6 trees with potential nests were identified. All six trees were climbed and no RTV nests (active or inactive) were identified. (Two old bird nests and 4 piles of debris were found).

Survey and Manage Mollusks: When planning for the project was initiated eight survey and manage mollusk species were known or suspected to occur within the Cascades Resource Area (see Table 1). Surveys were conducted for all eight species in compliance with the "Survey Protocol for Terrestrial Mollusk Species for the Northwest Forest Plan," Version 2.1 dated 10/98. Since then, four species have been dropped from Survey and Manage status. Unit B-4 was only surveyed for on the remaining four species.

The only target species detected was *Megomphix hemphilli* whose presence was verified in proposed Units A-1, B-1, 3 & 4, C-1 and D-1 and in three previously dropped units.

Table WL 1. Mollusk Species Surveyed for in the Clear Dodger Area.

Species	Species Found Y/N	Total # Sites	Location	Species Status
SNAILS				
***Megomphix hemphilli* (MEHE)**	Y	18	A-1, B-1, B-3, B-4, C-1, D-1	(SM)
Pristiloma arcticum crateris (PRARCR)	N	0	NA	(SM)
Cryptomastix devia (CRDE)	N	0	NA	(SM)
SLUGS				
Deroceras hesperium (DEHE)	N	0	NA	(SM)
Hemphillia glandulosa (HEGL)				Dropped [6/02] **
Hemphillia malonei (HEMA)				Dropped [6/02] **
Prophysaon coeruleum (PRCO)				Dropped [1/01] *
Prophysaon dubium (PRDU)				Dropped [1/01] *

* Dropped from Survey and Manage lists in accordance with the *Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and Other Mitigation Measures Standards and Guidelines (SM/ROD, January, 2001)*
** Dropped from Survey and Manage lists in accordance with the *2001 Survey and Manage Annual Species Review - IM OR-2002-064 (June 2002).*

Cumulative Effects/Road Densities

The Clear Dodger proposal is located in the Upper Clear Creek and Middle Clackamas River Watersheds. For the Upper Clear Creek watershed open (not gated or blocked) road densities are less then 3.5 miles per section, which is at or just below the threshold for wildlife. The Lower Clackamas River Watershed analysis does not disclose road densities.

Riparian Reserves

Salem District records and field reconnaissance yield the following site descriptions of the Riparian Reserves within the proposed sale areas:

<u>T.4S., R.4E. Sec 13 (approx 400 acres of federal land)</u>
Approximately 10 percent of the Riparian Reserves in this section are classed as either non-forest or in an early successional stage with little or no structural development or species diversity.

The remaining 90 percent is more of a mid-seral mix of stands, with age classes ranging from 40 to 80 years. Some of the 80-year-old acres were commercially thinned in the mid 1970's. Species composition is good, tree sizes range up to 28 inches DBH, but structural components such as Class 1 or 2 large down wood and large snags are not commonly found.

T.4S., R.4E. Sec 23 (approx 200 acres of federal land)
Approximately 50 percent of the Riparian Reserves here are classed as 50-year-old mid-seral stands. Species composition is a mix of conifers and hardwoods with little structural development. Tree sizes range up to 18 inches DBH, and there is little in the way of large down wood or large standing snags. The remaining 50 percent is an older mid-seral timber type of 80 years that is mostly conifer. Much of it was thinned in the mid-1970's and tree sizes range up to 28 inches. Structural attributes such as Class 1 or 2 large down wood and large snags are not commonly found.

T4S., R4E. Sec 24 (approx. 40 acres of federal land)
One hundred percent of the Riparian Reserves here are classed as an older mid-seral conifer timber type of 80 years. These acres were also commercially thinned in the mid-1970's. Tree sizes range up to 28 inches DBH, but structural attributes such as Class 1 or 2 large down wood and large snags are not common. A large component of conifer understory trees was initiated when the stand was commercially thinned.

T.4S., R.4E. Sec 25 (approx 40 acres of federal land)
One hundred percent of the Riparian Reserves here are classed as an older mid-seral conifer timber type of 80 years. These acres were also commercially thinned in the mid-1970's. Tree sizes range up to 28 inches DBH, but structural attributes such as Class 1 or 2 large down wood and large snags are not common. A large component of conifer understory trees was initiated when the stand was commercially thinned. This is most pronounced in the Riparian reserve associated with the creek on the east property line. Here, the overstory supports approximately 65 large trees per acre with an thick understory of approximately 140 four to eight inch diameter trees per acre. The understory development has been good, but is stagnating now due to lower available light afforded by the large, well developed crowns of the overstory, and the large numbers of understory trees on the site. The sizeable gap between these two canopy levels will remain for decades due to this stagnation.

Fisheries

Fisheries and Aquatic Habitat

Two of the proposed thinning units are adjacent to fish-bearing streams. The North Fork of Clear Creek flows adjacent to units A-1 in Section 23 and D-1 in Section 25. North Fork Clear Creek supports a population of resident cutthroat trout (*Oncorhynchus clarki*), and probably also supports sculpins (*Cottus, spp.*), although none were found during fish presence/absence surveys conducted on May 9, 2001. The stream that flows adjacent to Unit B-1 in Section 13 (unnamed tributary to Little Cedar Creek) is intermittent in the vicinity of the proposed unit. The proposal includes three units (B-2, B-3 and B-4) that are located in the Middle Clackamas River watershed. All of the streams in the vicinity of these units flow in a northwesterly direction to North Fork Reservoir, and are too small and steep to support fish populations.

Fish presence/absence surveys are located in Clear Dodger EA file.

Approximately two miles downstream of proposed Unit A-1, below the confluence of Clear Creek and North Fork Clear Creek, the mainstem of Clear Creek supports populations of winter steelhead trout (*O. mykiss*), resident and sea-run cutthroat trout and coho salmon (*O. kisutch*). Chinook salmon (*O. tshawytscha*) are found in the lower reaches of Clear Creek, as are dace (*Rhinicthys, spp.*), redside shiner (*Richardsonius balteatus*), Pacific lamprey (*Entosphenus tridentatus*), Northern pikeminnow (*Ptychocheilus oregonensis*) and chiselmouth (*Acrocheilus alutaceus*). Upstream migration of fish is blocked just above the confluence of Clear Creek and North Fork Clear Creek by waterfalls in both forks.

The assemblage of fishes found in the Middle Clackamas River and North Fork Reservoir is similar to that found in Clear Creek, with the addition of hatchery stocks of summer steelhead and rainbow trout (both *O. mykiss*), mountain whitefish (*Prosopium williamsoni*) and suckers (*Catostomus, spp.*).

Threatened and Endangered and Special Attention Species

Lower Columbia River steelhead trout, Lower Columbia River Chinook salmon and Upper Willamette River Chinook salmon, all of which may be found in Clear Creek and in the Middle Clackamas River, are listed as 'threatened' under the Endangered Species Act of 1973 (ESA), as amended. Consultation with NOAA Fisheries is required for projects that 'may affect' listed species. A determination has been made that this proposed project would have 'no effect' on Lower Columbia River steelhead trout, Lower Columbia River Chinook salmon or Upper Willamette River Chinook salmon (See Appendix **E**, *Determination of Effect for Lower Columbia River steelhead trout, Lower Columbia River Chinook salmon and Upper Willamette River Chinook salmon*).
Generally, for the Clear Creek watershed the 'no effect' determination is based on the distance upstream of project activities from ESA listed fish habitat (~2 miles for the closest unit, 4-5 miles for the rest), and project design criteria that include no harvest activity within Riparian Reserves, minimal road construction, dry season hauling of timber and post-project leave tree densities of 140 trees per acre.

For units in the Middle Clackamas River watershed the project design criteria are similar, but the 'no effect' determination is additionally based on the location of the proposed project units above North Fork Reservoir. Although no impacts to the stream channels that drain the vicinity of the units are anticipated, if any were to occur, they would have no effect on ESA listed fish species found in the reservoir or downstream due to the buffering effect of the reservoir.

Hydrology

Project Area Precipitation and Basin Hydrology

The project area is located in the Oregon Western Cascades range at elevations between 1,300 - 2,000 feet. Approximately one-half of the project area is subject to rain on snow events (ROS) which have the potential to increase peak flows during winter or spring storms. This zone varies with temperature during winter storms but is assumed to lie between 1,500 - 3,000 feet in elevation.

The project area receives approximately 70-78 inches of rain annually and has a mean 2-year precipitation event between 3.0-3.5 inches in a 24-hour period (*N.O.A.A. Precipitation-Frequency Atlas for Oregon, Volume X*).

The project area is part of three sixth field watersheds with approximately 45,731 acres (71.5 miles^2) in drainage area. The primary streams draining the area are Clear Creek and the middle Clackamas River: all tributaries to the Clackamas River fourth field #17090011 (U.S.D.I., 1974).

Project Area Stream Flow

There are six stream gaging stations on the Clackamas river from Estacada upstream to Timothy Lake. None of the tributary channels in the project area have been gaged. Typical of western cascades, most stream flow occurs during winter storm events. Peak flows occur following a rapid and substantial depletion of the snowpack during prolonged rain-on-snow periods (ROS) in the "transient snow zone," estimated to lie between 1500 feet and 4000 feet elevation in the lower Clackamas (U.S.D.A, 1996).
The two largest peak flow events in the last century took place in 1964 and in February of 1996. Both were estimated at or above a 100 year flood return interval and both were in response to substantial snow pack melt-off. Base-flow or low-flow occurs during late summer and early fall when mean stream discharge drops below 20% of the mean winter flow. Many small headwater channels dry up completely during this period.

Project Area Stream Channels

Small headwater channels, mostly with an ephemeral or intermittent flow regime, predominate in the project area. In flat, stable arreas, Rosgen type "A" channels are common: >10% gradient, entrenched, low width/depth ratio, low sinuosity. These streams were noted near units A-1, B-1, C-1, and D-1. Reflecting their colluvial natural (dominated by hill-slope geomorphic processes) channel substrates are predominately in the gravel to sand size classes.

On the steeper terrain to the east of units B-2, B-3 and B-4, Rosgen Aa+ channel types form: high gradient, deeply entrenched, debris torrent streams. These channels are more commonly subject to landslides and debris torrents. They have high rates of sediment transport during episodic events, with long periods of valley filling in between. They are filled with large wood and debris and adjacent slopes are moderately unstable. All the channels viewed in the field are currently in "proper functioning condition" (*U.S.D.I., 1998*).

Utilizing the Montgomery-Buffington typology (*Montgomery & Buffington, 1997*), all the channels in the project area would be classified as colluvial: "small, headwater streams at the tips of a channel network that flow over a colluvial valley fill and exhibit weak or ephemeral fluvial transport." Episodic transport by debris flows may account for most of the sediment transport in these steep headwater channels.

There are no treatments planned adjacent to larger, perennial streams in the area.

Project Area Water Quality

The water quality parameters with the potential to be affected by this proposal include stream temperature, dissolved oxygen (DO) concentrations, hydrogen ion concentration (pH), and turbidity. Additional water quality parameters (e.g., nutrients, pesticide and herbicide residues, bacteria, etc.) are not highly sensitive to forest harvest and road construction (*U.S.E.P.A.,1991*) and were not reviewed for this analysis.

The State of Oregon has established water quality standards "not to be exceeded" for all waters of the state. For the Willamette Basin these standards are published in the Oregon Administrative Rules, Chapter 340, Division 41, 442- of the Department of Environmental Quality (DEQ).

For Salmonid fish producing waters, no measurable increases in stream temperature are allowed where temperatures are 58° F (14.4° C) or greater. For Non-Salmonid fish waters, no measurable increases in stream temperature are allowed where temperatures are 64° F (17.8° C) or greater. Dissolved oxygen (DO) concentrations *shall not be less than* 90% saturation at the seasonal low or less than 95% of saturation in spawning areas during spawning, incubation, hatching, and fry stages of salmonid fishes. In Non-Salmonid fish producing waters, DO levels should not fall below 6 mg/l. Hydrogen ion concentration (pH) shall not fall outside the range of 6.5-8.5. Turbidity, measured in Nephelometric Turbidity Units (NTUs), shall not increase by more than 10% as measured relative to a control point immediately upstream of the turbidity causing activity. Conductivity, which is often measured in combination with pH or other water chemistry parameters, does not have a state standard.

Stream Temperature

No stream temperature data in the project area was located for this assessment. The Lower Clackamas River Watershed Analysis indicated that summer stream temperatures in the main stem of the lower Clackamas (measured in the summer of 1994) were found to be above the State of Oregon's threshold of 17.8° C at the confluence with the South Fork. Similarly, limited stream temperature data was collected by the DEQ in lower Clear Creek in the early 1970s indicating that summer temperatures exceeded the state standard (U.S.D.I., 1995).

The Clear and Foster Creek Watershed Assessment (WPN, 2002) summarized data on several water quality parameters in the watershed however, most of this data was collected in the lower mainstem and does not necessarily reflect conditions in the project area (i.e., Upper Clear Creek). Nevertheless, this report indicated that water temperatures in the upper portion of the watershed are generally cool and, once again, that temperature increases to above state standards in the lower 8-12 miles of Clear Creek.

Dissolved Oxygen, pH, and Conductivity

No data for these variables in the project area was located for this assessment.

Turbidity and Sediment

No data for stream turbidity in the project area was located for this assessment. Turbidity in the lower portions of the watershed remained quite low during the 2001 sampling season (WPN, 2002).

Biological Indicators

Limited macroinvertebrate sampling has been conducted in the watershed by Jeff Adams (WPN, 2002). One upper Clear Creek sample indicated that "the macroinvertebrate community is moderately depressed in comparison to reference conditions." There was no indication in the report where this sample was collected.

Oregon Department of Environmental Quality

The DEQs 1998 303d List of Water Quality Limited Streams is a compilation of streams which do not meet the state's water quality standards. Clear Creek is not listed as water quality limited by the State of Oregon. However, the lower Clackamas River is listed as not meeting water quality standards for summer stream temperatures and E Coli. The listing pertains to the portion of the river below Estacada. The DEQ is currently developing a Total Maximum Daily Load (TMDL) for the watershed which is slated for completion in 2003.

The DEQ has also published an assessment, the 319 Report, which identifies streams with potential non-point water pollution problems (1988 Oregon Statewide Assessment of Nonpoint Sources of Water Pollution).

Table 6. *1988 Oregon Statewide Assessment of Non-point Sources of Water Pollution*

	Water Quality Conditions Affecting:				
Watershed/ Stream Reach	General WQ	Drinking Water	Recreation/ Shellfish	Fish	Aquatic habitat
Clackamas 49	MO	NP	NP	MO	MO
Clear Cr. 52	MO	NP	NP	MO	NP

NP = No Problem And/Or No Data
MO = Moderate Problem based on Observation (no collaborating data)
MD = Moderate Problem with data

Portions of Clear Creek and the Clackamas River were identified as having moderate water quality problems ("observation"), which may be affecting general water quality, fisheries and, for the Clackamas, aquatic habitat. Data sources were not specified. The pollution types include sediment and erosion. The probable causes of water quality problems are listed as erosion and animal waste disposal.

Beneficial uses of surface water from the project area are displayed in **Table 7**. There are several municipal water users on the Clackamas and Clear Creek downstream from the project area as well as water withdrawals for domestic use, irrigation and livestock watering. Both resident and anadromous fish are less than one mile downstream from several of the proposed units. Additional beneficial uses include: Industrial Water Supply, Wildlife & Hunting, Fishing, Boating, Anadromous Fish Passage, Water Contact Recreation, Aesthetic Quality and Hydro Power.

Table 7. Beneficial uses associated with streams in the project area.

Stream (Watershed)	Project Action	Beneficial Use	Distance from Project Action	Information Source
Lower Clackamas Clear Creek	Timber harvest: density management Road construction and reconstruction.	Salmonid rearing and spawning	< 1 mile downstream in the Clackamas and Clear Creek	BLM
		Resident fish & Aquatic Life	Below units A-1 and D-1	BLM
		Irrigation & Domestic Drinking Water	<1 mile downstream in Clear Creek	WRIS*
		Municipal Drinking Water (Cities of Estacada and Clackamas)	< 1 mile in mainstem Clakamas and Clear Creek	WRIS*

* WRIS = *Water Rights Information System* of the Oregon Department of Water Resources

Botany

The proposed project area lies along the west slopes of the Cascades, within the Middle Clackamas and the Lower Clackamas Watersheds. The habitat is primarily shady, moist conifer forest dominated by young to mature 2nd growth Douglas-fir. Disturbed ground in the project area consists of road corridors, off-road vehicle trails and past logging activities. The project area was surveyed for Special Status Species, Survey & Manage Species and Noxious Weeds according to established protocols with the following results:

Special Status Species Found: No Special Status Species were identified during any of the field surveys conducted at the proposed Clear Dodger Timber Sale.

Survey and Manage Species Found:

Species	Status	Type
Cetrelia cetrarioides	S&M E	Lichen
Craterellus tubaeformis	S&M D dropped	Fungi
Ramaria stuntzii	S&M B	Fungi
Ramaria araiospora var. rubella	S&M B	Fungi
Ramaria araiospora var. araiospora	S&M B	Fungi

Noxious Weeds found:

Species	Common Name	Status
Cytisus scoparius	Scotch broom	Priority III
Cirsium arvense	Canada Thistle	Priority III
Cirsium vulgare	Bull Thistle	Priority III
Hypericum perforatum	St. Johns Wort	Priority III
Senecio jacobaea	Tansy Ragwort	Priority III

A complete list of all botanical species identified during the field surveys is available in the Clear Dodger NEPA File, Botany Report.

Visual Resources

The intermixed land ownership pattern between public and private forest land in the vicinity of the proposed units, greatly limits the BLM's ability to manage this area as a contiguous viewshed. Timber harvest activities near or adjacent to the units are observable on private and public lands.

VRM Class II: The Salem District RMP calls for managing Class II lands for low levels of change and retention of the existing landscape character. Management activities may be seen, but should not attract the attention of the casual observer.

Units B-4 and B-5: During a field review, several key observation points (See Key Observation Point Map and VRM Class 2 Photos, Recreation/Visual Resources Report, Clear Dodger NEPA File) were identified for Units B-4 and B-5 from Highway 224 and North Fork Reservoir. Within the two miles between Observation Points 1 through 6, intermittent views of one or both of the units are observable. The units are more observable traveling southeast rather than northwest on Highway 224.

Observation Point 4 is from along the shoreline of North Fork Reservoir from a concrete dock (accessed by Faraday Road). Portions of B-5 are observable. There is a recent harvest unit adjacent to Unit B-5 making it possible for observers to see a full profile of the trees in the unit. It appears that little or none of Unit B-4 is observable from this viewpoint. The length of time that Unit B-5 and possibly B-4 is observable from the reservoir would be dependent upon the location, duration and type of observer activity.

VRM Class III: The Salem District RMP calls for managing Class III lands for moderate levels of change and partial retention of the existing landscape character. Management activities may attract the attention, but should not dominate the view of the casual observer.

Units A-1 and C-1: During a field review, portions Hillockburn Road directly adjacent to or near the units were identified as the key observation points (See Key Observation Point Map). The units would be in view for less than a minute driving either direction along Hillockburn Road. Glimpses of the units from other locations may be possible, but no specific viewpoints were identified.

VRM Class IV: The Salem District RMP calls for managing Class IV lands for moderate levels of change with the allowance for major modifications to the existing landscape character. Management activities may dominate the view and be the major focus of viewer attention.

Units B-1, B-2, B-3 and D-1: These units are seldom seen. Little or none of the units appear to be observable from major public travel routes, recreation areas, residences, or other key observation points. No special visual features or specific concerns were identified.

Other Resources

Cultural Resources: Cultural resource surveys were completed, concentrating on the most likely areas to have been used by native peoples and early immigrants. No significant cultural resources were found.

Air Quality: There are a number of rural residents along the Hillockburn Road in the vicinity of the project area. These residents could be affected by residual smoke from burning piles. Smoke output is expected to be of short duration and burning would likely be done consistent with the Oregon Department of Environmental Quality Smoke Management Program.

Recreation: All of the proposed units are characterized by a forest setting and are accessed by either Hillockburn Road or gravel forest roads. Evidence of man-made modifications (roads, timber harvest, utilities, residential development) is common on both private and public lands in general area around the units. Timber harvest activities are likely to continue on private and public forest lands in the vicinity of the units. There are no developed recreational facilities within or near any of the units. Hillockburn Road is frequently used by the public to access public lands. Roads leading to Units A-1 and B-1 through B-5 are currently gated, limiting public motorized access. Spur roads leading into Unit C-1 are also blocked. Recreational use of the units appears to be low. Some of the recreational activities that may occur include camping, hunting, target shooting, hiking, and horseback riding. Off-road use by motorized vehicles was not evident in any of the units, but does occur in the general area.

Rural Interface: None of the proposed units are in a Rural Interface Area. There are several residences located along Hillockburn Road. There is a residence near the eastern boundary of Unit C-1. It is expected that haul routes would pass by these residences. Log truck traffic has historically occurred on Hillockburn Road and other nearby timber haul routes.

Garbage dumping is a problem along Hillockburn Road and many of the forest roads leading from Hillockburn Road.

Chapter 4 - Environmental Consequences

The following descriptions include environmental features, which would be affected by timber harvest and associated activities. Resource values are not identified in this section when there are no site-specific impacts (reference Appendix B), site specific impacts are considered negligible or the cumulative impacts described in the FEIS were considered adequate.

Timber And General Vegetation

Proposed Action, Alternative A:

This proposal would increase the growth rates of the residual trees remaining after thinning. This would result in larger, healthier trees with fewer stems per acre. The total net yield for the site would increase and the final harvest volume would have larger and higher quality timber. The wider spacing of the residual trees would result in increased growth of understory trees and shrubs, which would provide a richer more diverse habitat for wildlife.

Some damage can be expected to the residual trees from the logging operation. Scraping of bark and damage to roots can be expected in or near yarding roads. The amount and extent of damage is dependant on the reliability of the operator, the adequacy of the logging design and the time and effort of the contract administrator. A few damaged trees are considered desirable as this would allow decay to begin and would be potential future cavity nesting habitat.

The proposed timber sale would supply approximately 1600 MBF of timber to the market.

The proposed action would have no effect on the amount of Late Successional Forest within either the Upper Clear or Lower Clackamas watersheds. Since the proposed action is a partial cut, stands that may already be considered late successional stands would continue to be classified late successional forest stands. Many of the stands identified to be treated are not yet late successional forest.

No Action Alternative, Alternative B

The stands would continue to grow but at a reduced rate. Crowns would close and there would be more suppression mortality resulting in more snags and down wood. Understory vegetation would be reduced in quantity and diversity because of the reduced light reaching the forest floor. At rotation age there would be smaller trees to harvest of lower quality and total net yield could be reduced below the potential for the site.

Soils

Proposed Action, Alternative A

Project 1 – Timber Management

Cable Yarding

Cable yarding, with partial suspension (one-end of each log), would result in 1 to 5% areal compaction, resulting in 1 to 3 % loss in long-term productivity (depending on season of yarding and soil moisture content) compared with the same area without compaction.

A previous discussion of Clear Dodger Timber Sale soils (in Chapter 3 – Description of the Affected Environment) revealed the erodability potential of the various soil series within the project area. From this narrative cable yarding, with one-end log suspension, and ground-based yarding would result in low soil erosion levels, except for soil series 6F (Aschoff-Brightwood Complex), which occurs within a portion of units B-3 and B-4. While the erodability for this soil series is rated as moderate, these two units are located on flat topography (less than 20% slope). Therefore, the erodability rating for both of these two units is closer to low.

Ground-based Yarding (either Conventional, Harvester/forwarder or Shovel Yarding Equipment)

Depending upon the yarding equipment employed, different contract stipulations should be specified in the timber sale contract for each equipment type specified, in order to comply with the soil compaction guideline stated in the Salem District RMP (areal extent of skid roads plus landings would be less than 10 percent of each harvest unit). Similar contract wording for all ground-based yarding should be used in conjunction with main skid trail spacing (not less than 150 feet apart), maximum equipment width (not wider than 12 feet), terrain allowed on (slopes not greater than 35%), closure of all main skid trail entrances following yarding (all will be blocked to the satisfaction of the Authorized Officer), and seasonal restriction (all ground-based operations will only be permitted during dry weather periods, which normally occurs between July 1 through October 31).

In addition to the above constraints, for conventional ground-based yarding and forwarder equipment, all machinery will be required to stay on main skid trails at all times, and existing skid trails from previous harvest entries will be used whenever possible (there are, in many locations, twice as many existing skid trails as needed to yard this project and still comply with the 10 percent soil compaction guideline).

If the purchaser of this timber sale requests permission to utilize cable yarding in place of ground-based, approval may be granted as long as all other contract stipulations are complied with. Anything outside of these stipulations would likely compromise other forest resources, especially with respect to fisheries and water quality.

If harvester equipment is utilized, it shall be a tracked-type machine with less than 10 psi ground pressure. The harvester will be required to operate on slash and brush (whenever possible), which may require the placing of this material in front of the machine before moving of it. Also, the harvester will be allowed only one pass over the same piece of ground (a second pass may be permitted in certain instances, but this will be the exception rather than the rule).

For shovel yarding, the contract stipulations are the same as for the harvester, except that there is no 10 psi maximum ground pressure requirement.

Since this harvest alternative consists of partial cutting only, all main skid trails shall be left intact for use in future harvest entries and not ripped, in order to prevent damage to reserve trees from root pulling by ripping equipment.

Site Preparation
Site preparation activities prescribed for this project would not adversely affect long-term site productivity.

Project 2 – Road Management

There will be no net increase in roads or in land taken out of the productive timber base due to road construction. Approximately 2,000 feet of road construction will be accomplished during periods of dry soil conditions and this could result in minimal sediment inputs into streams from potential soil erosion. All of this new road construction will be unsurfaced and will be ripped following the completion of this timber sale harvest and site preparation.

In addition, approximately 2,200 feet of existing road length would be decommissioned within the project area. These roadways will not be needed for future harvest access. This would further reduce sediment inputs into stream channels by increasing infiltration, and would return this land to productive timber base.

Roads required for future access, within the project area, would be either gated or closed. Road closure devices, adjacent to Hillockburn Road, would be designed to minimize visual impacts (i.e., either guard rail or jersey barrier). The creation of any of these road closure devices should not negatively affect soil resources or increase sediment inputs into streams, since this work will be accomplished during dry soil conditions and these locations are located in existing right-of-ways, which have been heavily impacted previously (through compaction and/or soil displacement).

Project 3 – Riparian Reserve Treatment

Since only tree girdling (either at the base or near the top of the tree) is proposed by this action, riparian reserve treatment would not impact soil resources or long-term site productivity.

No Action Alternative, Alternative B

Normal levels of soils processes will continue; compacted areas will recover through tree root invasion, freezing and thawing, etc (full recovery is normally expected to occur within one rotation or eighty years), soil building will occur through litter build up and decomposition, roads identified for decommissioning or closing would not be treated.

Wildlife

Proposed Action, Alternative A

Remnant Snags and Coarse Woody Debris

In the short term, existing snags and CWD habitat would be retained as much as possible, however, direct adverse impacts due to logging may occur. In the long term, green tree retention, CWD recruitment, and topping up to 2 trees per acre to create snags and culls would encourage the development of this type of material.

Federally Listed Species

Northern spotted owl

The Clear Dodger proposal was submitted for Formal Consultation with U.S. Fish and Wildlife Service on September 3, 2002. A Biological Opinion was completed on February 27, 2003, FWS reference: 1-7-03-F-0008. Consultation resulted in a *"May Affect, Likely to Adversely Affect"* determination because the proposed action would *downgrade* suitable habitat by reducing canopy closure to less than 60 percent. However, the Service also reached the conclusion in this BO that the FY 2003-2004 Habitat Modification Projects in the Willamette Province (which the Clear Dodger proposed project is a part thereof) are not likely to jeopardize the continued existence of the bald eagle or spotted owl and is not likely to destroy or adversely modify critical habitat for the spotted owl. All applicable terms and conditions from the Biological Opinion would be incorporated into the project design features.

The seasonal restriction on all units would minimize the risk of disturbance if nesting spotted owls are encountered within disturbance range (0.25 to 0.5 miles) of the units.

In the short term, 128 acres of suitable habitat would be downgraded to dispersal habitat as a result of thinning. In the long term, suitable habitat conditions would develop again in 2 to 3 decades.

In the short term, 33 acres of dispersal habitat would be degraded as a result of thinning these stands but would 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.

There would be no effects on Critical Habitat.

Bald Eagle: The Clear Dodger proposal, as designed, would have no effect on bald eagles or their habitat. Bald eagles have never been observed in the Clear Dodger area.

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

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 a short-term adverse impacts on these species. Micro-habitat drying is anticipated to occur as canopies are opened up. There is a shortage of large snags and CWD in these stands. Impacts to 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 occurs.

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 and no entry buffers would adequately protect aquatic amphibians, and provide protection for bats that 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 capitalizes on the benefits of green tree retention and understory development.

Red Tree Vole: Protocol surveys resulted in no nest trees being identified therefore mitigation is not required. However, surveys are designed so as to visually cover approximately 68 percent of the survey area. Therefore there may be a loss of suitable habitat for red tree voles that were not detected during surveys as a result of the reduction in canopy closures below 60 percent. Riparian Reserves and areas dropped or not included in the proposal would continue to provide habitat for red tree voles.

Survey and Manage Mollusks

Known sites of *Megomphix hemphilli (MEHE)* would be protected with buffers as necessary to maintain micro-habitat and persistence. Eighteen *MEHE* sites were located during surveys of the Clear Dodger project area, of which, 17 are in the vicinity of units which are still included as part of the Clear Dodger proposal.

There may be a loss of habitat for mollusks that were not detected. Riparian Reserves and areas dropped or not included in the proposal would continue to provide habitat for mollusks. Additional CWD as well as crown cover from residuals would provide shade and microclimates would assist mollusk species to persist.

No Action Alternative, Alternative B

Remnant Snags and Coarse Woody Debris

Natural processes would continue, and competition among overstory trees would continue. Due to past management in these stands, much of the material that would have developed into snags and CWD was removed. Large diameter material over 20 inches would be recruited over decades, and snags and CWD would be generated over long periods of time. Existing material would remain intact, but continue to decay.

Federally Listed Species

Northern spotted owl: There would be no change in spotted owl habitat and no effect to spotted owls. Habitat conditions would remain as described in the Affected Environment.

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

There would be no effect on Bureau Sensitive, Special Attention (including Survey and Manage), or other species of concern. Habitat conditions would remain as described in the Affected Environment.

Riparian Reserves

Proposed Action, Alternative A

Project 1- Commercial Thinning would be done outside of Riparian Reserves (RR's) and except for the thinning effect on the edges of the Riparian Reserves adjacent to the thinning units, there would be no impact to the Riparian Reserves. By thinning that forest immediately adjacent to the RR's, the trees on the thinned edge would receive an increase in light, water and nutrients. A slight increase it tree growth, as well as increased growth of the brush and shrub layers may be expected along this interface zone.

Project 2 - Road Management: Two aspects of this project would have direct effects upon Riparian Reserves: blocking of approximately 600 feet of the existing road in Unit D-1 and repairing and removing the culvert on the road accessing Unit B-1. Both of these items would have direct beneficial effects to the Riparian Reserves. Blocking the road that accesses Unit D-1 would eliminate traffic and garbage dumping where this road passes through a Riparian Reserve.

Project 3, Snag Creation T.4S., R.4E. Sections 13, 23, 24, and 25

By creating up to eight snags per acre in the older conifer dominated portions of the Riparian Reserves, an element of increased decadence would be added to the areas treated. In unmanaged areas, the treatment would accelerate ongoing snag recruitment on a small portion of a larger landscape where large dead wood is not commonly found due to intense forest management. In the managed stands (previously thinned), it would restore a dead wood component that was largely eliminated at the time of logging operations. Limited tree girdling (up to 8 per acre) of the understory would allow more room and enhance crown development of the residual understory trees. Many wildlife species rely on this dead wood resource, and diverse stand structure to help fulfill their life history requirements.

Local Douglas-fir bark beetle population increases may be expected as a result of these actions. A large population increase due to creating large amounts of freshly killed Douglas-fir could result in some of the residual green Douglas-fir trees being adversely affected (Hostetler and Ross. 1996). However, because of the small scale of the proposal, and by following Hostetler's guidelines to minimizing potential bark beetle damage, the risk of sustaining significant adverse effects to residual green trees is considered to be low to moderate with this proposal.

No Action Alternative, Alternative B

Project 1- Commercial Thinning: The slight increase in tree and understory vegetation growth along the interface zone between the Riparian Reserves and the thinning units would not occur.

Project 2 - Road Management: Six hundred feet of existing road would remain within a Riparian Reserve. Garbage would continue to pile up where secondary roads pass through reserves. The improperly installed and failing culvert on the road to Unit B-1 would continue to be dysfunctional and contribute sediments to the aquatic system.

Project 3 - Snag Creation T.4S., R.4E. Sections 13, 23, 24, and 25
Decadence, dead wood habitat, and structural diversity would remain at current low levels for potentially many more decades.

Fisheries and Aquatic Habitat

Proposed Action, Alternative A

The riparian reserve widths of one site potential tree on the non fish-bearing streams adjacent to the sale units and two site potential tree heights on the fish-bearing streams adjacent to Units A-1 and D-1 will be adequate to protect the aquatic and riparian resources and habitat from any effects of the proposed timber harvest. Site potential tree height in the project area is 180 feet at all units except Unit B-3, which has a site potential tree height of 200 feet. The reserves will also be sufficient to protect the aquatic and riparian resources downstream in Clear Creek and in the Clackamas River from effects of the proposed action.

The proposed road construction in Sections 24 and 25 would have no impacts on fish or aquatic habitat. The main potential impact of road construction and decommissioning on aquatic habitat is increased sedimentation to streams. The road locations are flat and have no hydrologic connections. Additionally, all road construction and decommissioning would be conducted during the dry season, eliminating the potential for stream sedimentation.

Lower Columbia River steelhead trout, Lower Columbia River chinook salmon and Upper Willamette River chinook salmon, all of which may be found in Clear Creek and in the Middle Clackamas River, are listed as 'threatened' under the Endangered Species Act of 1973 (ESA), as amended. Consultation with NOAA Fisheries is required for projects that 'may affect' listed species. A determination has been made that this proposed project would have 'no effect' on Lower Columbia River steelhead trout, Lower Columbia River chinook salmon or Upper Willamette River chinook salmon (See Appendix **E**, *Determination of Effect for Lower Columbia River steelhead trout, Lower Columbia River chinook salmon and Upper Willamette River chinook salmon*).

Generally, for the Clear Creek watershed the 'no effect' determination is based on the distance upstream of project activities from ESA listed fish habitat (~2 miles for the closest unit, 4-5 miles for the rest), and project design criteria that include no harvest activity within Riparian Reserves, minimal road construction, dry season hauling of timber and post-project leave tree densities of 140 trees per acre.

For units in the Middle Clackamas River watershed the project design criteria are similar, but the 'no effect' determination is additionally based on the location of the proposed project units above North Fork Reservoir. Although no impacts to the stream channels that drain the vicinity of the units are anticipated, if any were to occur, they would have no effect on ESA listed fish species found in the reservoir or downstream due to the buffering effect of the reservoir.

No Action Alternative, Alternative B

Since the Proposed Action is predicted to result in no effect to fisheries and aquatic habitat, the environmental effects of the No action Alternative are identical.

Hydrology

Proposed Action, Alternative A

Project 1 – Timber Management

Summary

Measurable direct and indirect effects to stream flow, channel function, and water quality as a result of the proposed action are of low probability. The proposed action alternative is unlikely to alter the current condition of the aquatic system either by affecting it's physical integrity, water quality, sediment regime or in-stream flows.

This proposal is unlikely to directly alter base flow or peak flow events in a measurable manner. Tree removal and road construction would not occur on steep, unstable slopes where the potential for mass wasting adjacent to stream reaches is high. Therefore, increases in sediment delivery to streams due to mass wasting are unlikely to result from either of these actions. In addition, potential impacts resulting from tree harvest and road construction would be mitigated and, with the implementation of Best Management Practices (BMPs), are unlikely to contribute measurable amounts of sediment to streams. Nearly all riparian forest cover is retained under the alternative, thereby maintaining riparian microclimate conditions and protecting streams from increases in temperature.

In conclusion, this proposal is unlikely to impede and/or prevent attainment of the stream flow and basin hydrology, channel function, or water quality objectives of the Aquatic Conservation Strategy (ACS). Over the long term this proposal should aid in meeting ACS objectives by speeding the development of older forest characteristics in small portions of the riparian zone where thinning is proposed.

Aquatic Conservation Strategy Objectives
See Appendix C

Project Area Stream Flow

Mean Annual Water Yield: Increases in mean annual water yield following the removal of watershed vegetation have been documented in numerous studies around the world (*Bosch et al., 1982*). Presumably, vegetation intercepts and evapotranspires precipitation that might otherwise become runoff. Thus, it can be assumed that the action alternative considered under this proposal would likely result in some small increase in water yield which correlates with the removal of the conifer over-story. However, other than increased peak flows (discussed below) the "increase in fall and winter discharge from forest activities is likely to have little biological or physical significance" (*U.S.E.P.A.,1991*).

Base Flow: Outside of fog-drip zones, removal of the forest cover usually results in an increase in summer base flow; presumably due to the reduction in evapotranspiration and interception (*Harr et al., 1979*). Thus, it can be assumed that the action alternative would likely result in some small increase in summer water yield which correlates with the removal of the conifer over-story.

Hypothetically, this action could have a beneficial indirect effect on the aquatic community of adjacent streams by increasing summer base flow. However, considering the small percentage of the watershed's coniferous forest that would be altered, this effect is not likely to be significant or measurable.

Peak Flow

Peak flows refer to the instantaneous maximum discharge associated with individual storm or snowmelt events (U.S.E.P.A.,1991). Since portions of the project area are above 1,500 feet, it can be assumed that the removal of portions of the conifer overstory would likely result in some small increase in water yield as a result of increases in snow accumulation and melting during ROS events. Once again, due to the small area considered in this action, this effect is not likely to be measurable directly.

Since the direct effects on streamflow of the action alternative is likely too small to be measured, the action was analyzed for its potential contribution to *cumulative effects* to peak flows in this watershed (see Cumulative Effects section later in this report).

Project Area Stream Channels

In the short term, this proposal is unlikely to alter the current condition of channels in the project area. Minimization of direct disturbances from the proposed action (e.g. increased flows or sediment delivery) is likely to result in the maintenance of stream channels in their current condition.

The Clear and Foster Creek Watershed Assessment (WPW, 2002) indicated that large wood recruitment potential from riparian areas in the upper Clear Creek watershed is satisfactory in only 1% of the stream reaches analyzed and recommended actions to improve potential recruitment. Over the long term, reductions in stand density would likely increase riparian and upland forest health and tree size. This would lead to increased large wood recruitment for stream channels, an important factor in proper channel function. In addition, more open stands would allow for the growth of important riparian species in the under-story, such as western red cedar, which are currently suppressed. In Clear Creek and the Clackamas River and its tributaries, large wood structure in the channel is particularly important because it has been depleted to levels below its natural range (U.S.D.I., 1995). Large wood in the channel would ultimately slow stream velocity, increase retention of organic material, capture bedload, and improve aquatic habitat.

Project Area Water Quality

Stream Temperature

For the Clear Creek Watershed Analysis (U.S.D.I., 1995), field surveys and review of aerial photographs indicated that shading is near to full potential along all the tributaries on public lands in the project area. Similarly, the Clear and Foster Creek Watershed Assessment (WPN, 2002) indicated that current shade levels on forested lands in the watershed are adequate for protection of stream temperature.

The headwaters of most channels in the project area have an intermittent flow regime and do not flow on the surface during most summers. These channels have very little potential to be heated by exposure to direct solar radiation. Forest density and hence shading immediately adjacent to perennial channels in the project area would be left virtually unaltered under this proposal. Riparian "no-treatment" zones were specifically placed to protect portions of tributary channels where forest shade helps to maintain the current stream temperature regime. Overall, this proposal is unlikely to have any measurable effect on stream temperatures in this watershed.

Dissolved Oxygen and pH and Conductivity

Heavy inputs of fine, fresh organic materials, particularly when combined with increases in stream temperature, sedimentation and reduced reaeration, can severely reduce the concentration of DO in small forested streams (*Hall and Lantz, 1969*). Since the proposed action is unlikely to result in any measurable increase in stream temperature or sedimentation, would not place large amounts of fine organic material in the stream and would not alter reaeration, it is unlikely that this proposal would have any measurable effect on DO levels in project area streams.

Available data indicates that most forest management activities have little effect on pH or conductivity (*U.S.E.P.A.,1991*). Hard rock mining is the one activity most likely to have a measurable effect on these variables (*Kunkle et al., 1987*) and is not part of this proposal. Therefore, it is unlikely that the proposed action would have any measurable effect on pH or conductivity in project area streams.

<u>Sediment Transport, Turbidity and Channel Substrates</u>

Two natural erosion processes, mass wasting and surface erosion, are the primary sources for sediment in steep terrain. However, sources of sediment are only half the equation: before water quality can be affected, the sediment must be transported to a stream. In addition to mass wasting, channel cutting and bank erosion are the other important processes that have the potential to significantly increase sediment supplies in streams. The potential effect of the proposed alternative on each of these processes is considered below.

Forest management on steep slopes may accelerate mass wasting processes. Two factors have been proposed as the primary mechanisms for increased rates of mass wasting: 1) loss of root strength following tree felling resulting in reductions in slope stability and, 2) increases in soil pore pressure due to the concentration of water on mass wasting susceptible areas on the slope.

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. However, practices that compact the soil surface, remove the "duff- layer" or concentrate runoff may lead to surface erosion with the potential for delivery to streams and a degradation of water quality.

Stream-bank erosion and channel cutting may be accelerated by reductions in channel roughness or resistance, increases in stream energy or the redirection of streamflow. Channel roughness is altered by the direct removal or placement of material into channels.

Historically, in forested regions of the Cascades, channel roughness was quite high due to large quantities of wood in channels. Roughness is also provided by vegetation on streambanks and removal of this vegetation can lead to increased bank erosion. Placement or removal of any of these materials would also likely result in a redirection of streamflow which may result in increased bank erosion.

Increases in stream energy result from increases in runoff (i.e., increased peak flows), increased flow depth from narrowing or laterally restricting flow or increased channel gradient (e.g., following channel straightening).

In most cases, management practices with the potential to accelerate erosion fall into three categories: road construction and hauling, timber harvest, and site preparation (particularly prescribed burning). BMPs and mitigation measures are proposed to eliminate and/or limit acceleration of sediment delivery to streams in the project area. As a result, it is unlikely that this proposal would lead to a measurable increase in sediment delivered to streams, stream turbidity, the alteration of stream substrate composition, or sediment transport regime.

Road Construction And Hauling

All new road construction would occur outside of riparian reserves on low to moderate slopes with stable surfaces emanating from the existing road network. The risk of road related landslides in these locations is minimal. Since no additional stream crossings would be constructed, road construction in this proposal would not cause an expansion of the stream network nor would it provide additional opportunities for road sediment from fill failures or ditch-line run-off to enter stream channels.

All road construction would utilize the BMPs required by the Federal Clean Water Act (as amended by the Water Quality Act of 1987) to reduce non-point source pollution to the maximum extent practicable. BMPs recognize and make use of the fact that, although road construction does lead to an inevitable increase in sediment available for erosion, without *pathways* or mechanisms for that sediment to enter streams, it would not affect water quality.

Finally, the proposal includes reconstruction and drainage improvements of existing roads needed to access the project area; including the replacement of a failing stream crossing structure. This would reduce road stream interactions with long term benefits for water quality and watershed hydrology (*Madej, 2001*). In conclusion, the road construction and improvements proposed under the proposed alternative is unlikely to have any measurable, long-term detrimental effect on watershed hydrology or water quality.

The main haul routes would be on rocked forest roads to the Hillockburn road, which is paved. Timber hauling during periods when water is flowing on roads and into ditches could potentially increase stream turbidity and suspended sediment transport with indirect detrimental effects on the streams physical and biological attributes (*Cederholm et al. 1980*). Mitigation measures to deal with this potential problem are cited under design features.

Tree Harvest And Yarding

Yarding corridors, if sufficiently compacted, may route surface water and sediment into streams. However, several factors limit the potential for this to occur: 1) even if compacted, high levels of residual slash on yarding corridors (both machine and cable) would contribute to reducing the accumulation of runoff by deflecting and redistributing overland flow laterally to areas where it will infiltrate into the soil, 2) gentle to moderate slope gradients in this project area provide little opportunity for surface water to flow, 3) the no-treatment zones in riparian areas have high surface roughness which functions to trap any overland flow and sediment before reaching streams, and 4) the small size of trees being yarded would limit surface disturbance to minimal levels.

Furthermore, most research to date supports the conclusion that the effectiveness of riparian buffer zones for trapping sediment before it can enter a water way reaches 100% at around 150 feet, particularly for diffuse sources such as a sale unit (CH2MHILL et al., 1999). The buffers in this proposal extend from 180 feet to over 360 feet, depending on the presence or absence of fish in the affected channel.

Areas with potential for slope instability and mass wasting were mapped in the Timber Production Capability Classification for the Salem District (U.S.D.I. 1987). All proposed treatment units are outside of any areas mapped as unstable. Tree removal is not proposed on steep, unstable slopes where the potential for mass wasting adjacent to stream reaches is high. Therefore, increases in sediment delivery to streams due to mass wasting induced by loss of root strength are unlikely to result from this action. In addition, the minimal levels of surface disturbance under this proposal are unlikely to result in the concentration of runoff on mass wasting susceptible slopes.

Tree falling and yarding into or through streams will be minimal under this proposal. The “no treatment buffers” around all streams will eliminate most disturbance of stream side vegetation. Therefore, it is unlikely that this proposal would increase bank erosion or channel cutting by altering channel roughness, redirecting flows or altering bank stabilizing vegetation. The potential for increases in stream energy due to alterations of peak flows is discussed under cumulative effects.

Cumulative Effects

Water Available for Runoff (WAR)

Jones and Grant (1996), among others, hypothesize that forest management leads to increases in stream-flow volume while road construction and wood removal from channels results in earlier, higher peak flows. Stream channel dimensions and characteristics adjust to accommodate the bank-full flows, which correspond to the 1-2 year event in lower gradient steams and apparently to the 5-year event in steeper mountain streams (Wolman and Miller 1960, Lisle 1981). Change in the magnitude of frequent flood flows can affect channel scour and may affect fish habitat. The cumulative effect of increases in runoff may be large, resulting in flooding, stream channel and bank damage.

Alterations in peak flow timing and quantity are particularly of concern in watersheds with potential for snow accumulation and quick melt-off during rain-on-snow events (ROS) such as occurred in the 1996 flood.

Water available for runoff (WAR) analysis estimates potential increases in peak flows during rain on snow events due to increasing openings in the forest canopy. A level 1 analysis for increases in peak flow was conducted using the Washington State DNR watershed analysis methods (Washington Forest Practice Board, 1997). Details of the analysis are contained in a supplemental report (Cumulative Effects Analysis of Peak Flow Events for the Clear Dodger Proposal) available in the EA file.

The Clear Dodger proposal was analyzed using a weighting system based on the dominant precipitation type (rain, transient snow, snow), and the percent of the area with canopy cover in three different categories (mature, intermediate, immature). The equations given in the Washington publication were modified using data from northern Oregon Cascade climate stations. Using this method, the change in water available for runoff (WAR) from rain on snow events was calculated. The WAR values were then used to estimate increases in peak flows during storms using the USGS publication: *Magnitude and Frequency of Floods in Western Oregon* (Harris et al.,1979).

Return periods are the peak flows resulting from 24-hour precipitation amounts expected at a given level of frequency; for example once in 5 years for the 5-year return period or once in 50 years for the 50-year return period. The plus (+) sign denotes a given return period precipitation event with the addition of a heavier snow pack on the ground than average, and a warmer storm than average. This situation is often responsible for the severe flood events experienced in the Pacific Northwest.

The table and graph on the following pages displays the range of peak discharge values that WAR predicts for Clear Dodger proposal in cubic feet per second (cfs).

Figure 1. Proposed Action

Clear Dodger		Proposed Alternative					
Proposed	Rain Zone	Trans Zone	Snow Zone				
Harvest:	2305	886	0				
Thinning:	61	100	0				

WAR Estimated Peak Discharge Summary Table (CFS)			% Change Over Full Forest	Proposed	% Change Over Full Forest	Natural Disturbance	% Change Over Full Forest
	Full Forest	Existing Cond.					
Q2 =	823	823	0.0	823	0.0	823	0.1
Q10 =	1573	1573	0.0	1573	0.0	1574	0.0
Q25 =	2000	2000	0.0	2000	0.0	2001	0.0
Q 50 =	2341	2342	0.0	2342	0.0	2342	0.0
Q100 =	2698	2698	0.0	2698	0.0	2699	0.0
Q2+	1719	2251	30.9	2531	47.2	2325	35.2
Q10+	2952	3715	25.9	4107	39.1	3820	29.4
Q25+	3610	4479	24.1	4921	36.3	4597	27.4
Q50+	4118	5062	22.9	5539	34.5	5190	26.0
Q100+	4624	5630	21.8	6135	32.7	5766	24.7

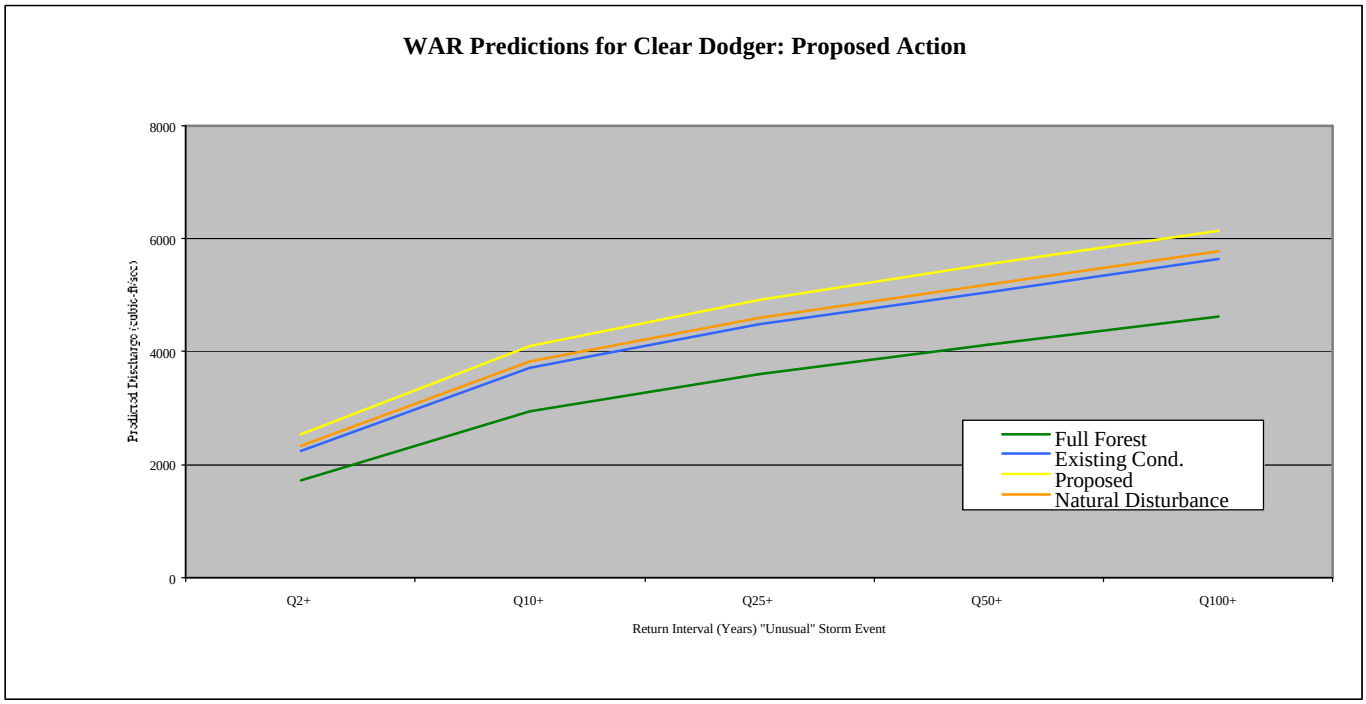
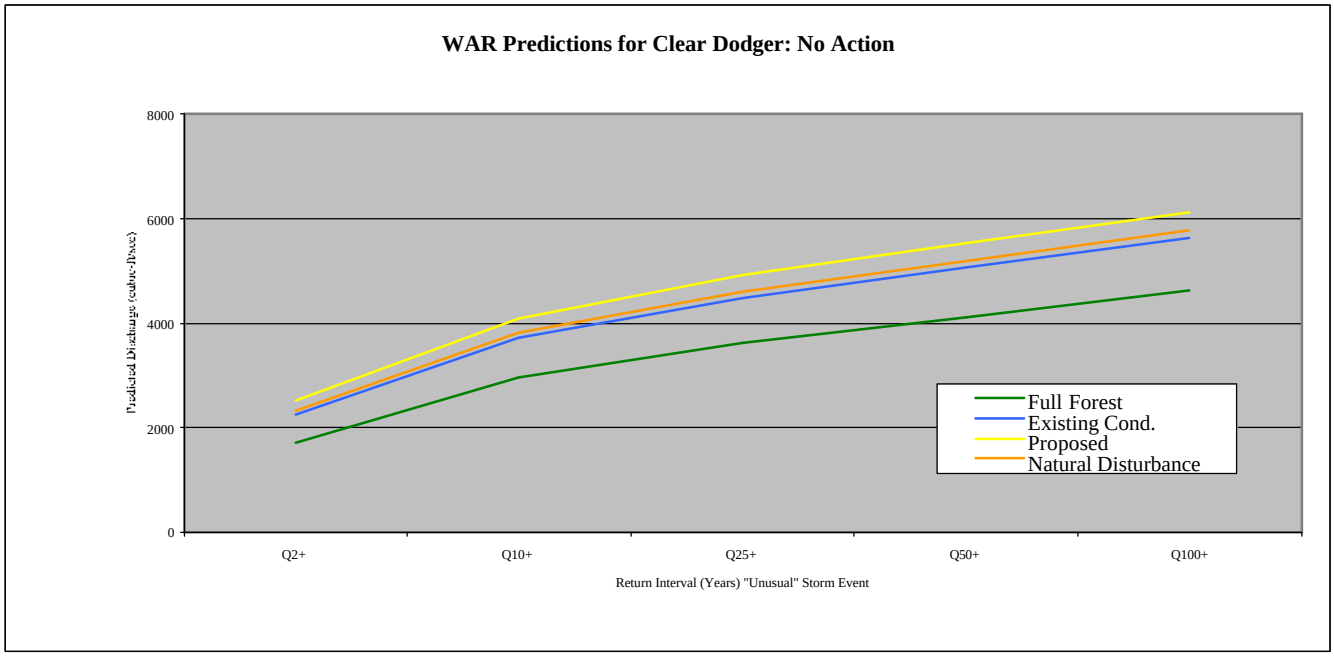


Figure 2. No-Action

Clear Dodger		No Action Alternative	
Proposed	Rain Zone	Trans Zone	Snow Zone
Harvest:	2305	886	0
Thinning:	0	0	0

WAR Estimated Peak Discharge Summary Table (CFS)			% Change Over Full Forest	Proposed	% Change Over Full Forest	Natural Disturbance	% Change Over Full Forest
	Full Forest	Existing Cond.					
Q2 =	823	823	0.0	823	0.0	823	0.1
Q10 =	1573	1573	0.0	1573	0.0	1574	0.0
Q25 =	2000	2000	0.0	2000	0.0	2001	0.0
Q 50 =	2341	2342	0.0	2342	0.0	2342	0.0
Q100 =	2698	2698	0.0	2698	0.0	2699	0.0
Q2+	1719	2251	30.9	2524	46.8	2325	35.2
Q10+	2952	3715	25.9	4096	38.8	3820	29.4
Q25+	3610	4479	24.1	4909	36.0	4597	27.4
Q50+	4118	5062	22.9	5526	34.2	5190	26.0
Q100+	4624	5630	21.8	6121	32.4	5766	24.7



Results

A percent change from estimated full forest conditions was calculated for the two alternatives assuming normal storm events and unusual events, as described in the Washington manual. All calculations for the WAR model were carried out in Microsoft Excel. Under the No Action and Proposed Action alternatives, WAR estimated ***no increase in peak flows for any return interval under normal storm conditions***. Thus, for normal storm events, no increases in peak flow relative to a theoretical full forest condition are expected under the proposal in conjunction with other activities in the watershed during this decade.

For unusual events the situation is somewhat different. WAR estimated an increase in peak flow for a two-year event (unusual storm conditions) from 1719 cubic-feet per second (cfs) under full forest cover to 2524 cfs under the No Action alternative and to 2531 cfs with the Proposed Action, an increase of 46.8 % and 47.2 %, respectively. The difference between the No Action and the Proposed Action is 7 cfs, a 0.4% increase over current conditions in these watersheds. Since the No Action indicates what is estimated to result solely as a result of private actions in the watershed, the difference between the No Action and the Proposed Action, an increase of 7 cfs (0.4%,) is attributable solely to actions proposed on the BLM. Thus, most of the estimated increase is a result of actions assumed to occur on private lands in this decade. Larger peak flows (Q5 – Q100) were also predicted to increase to levels above 30% for an unusual storm event.

These estimates place WAR values for the Clear Dodger watersheds in ranges above the 10% level considered to be below detection. WAR values above this level imply the ***possibility of adverse effects*** and receive a sensitivity rating of ***indeterminate*** (see C-40, A Peak Flow Sensitivity Ratings" in the Washington manual). Therefore, the possibility of increases in peak flows with consequences to the aquatic system cannot be ruled out. Under these circumstances, the method suggests that additional information be collected/analyzed in order to provide a more detailed assessment of the risks to the aquatic system (i.e., a Level 2 assessment).

Discussion

The indeterminate rating does not require that the actions considered under this proposal be delayed or postponed. Rather, it points to the possibility of impacts to the aquatic ecosystem in these watersheds at *some point during the ten-year analysis period*. In fact, the WAR analysis found that the 20% increase in a 2-yr peak flow (given as a threshold value for considering the effects of increased bed mobility and bed scour) has *already been exceeded* under current conditions. Thus, if stream channels in the area are sensitive to increases in peak flows, they likely have already adjusted to these increases.

When public actions are separated from assumed private actions in the watershed WAR estimated a 46.8% increase in 2-yr + peak flows over full forest due to the actions taken on private lands alone (i.e., No Action alternative). Thus, private actions alone are likely to push WAR values higher in this watershed irrespective of which alternative is chosen. In addition, the assumption that private landowners will harvest all mature forest cover in this decade is a worst-case scenario that probably overestimates what will actually take place.

Evaluating WAR values relative to an assumed full forest cover condition may be misleading. Under the natural disturbance regime in which portions of the watershed are burned, WAR predicted a 35.2% increase in peak flows relative to full cover for an unusual 2-yr event. When viewed in this manner, the existing condition of the watershed is below the range of flows that we would likely measure at a given point in time during the past. The Proposed Alternative is 11.6% higher than the range of peak flows that would be measured in this watershed under the assumptions of the natural disturbance regime, almost exclusively as a result of actions on private lands.

War values, in and of themselves, do not indicate the current condition of stream channels, fish habitat and downstream public resources; these must be evaluated in order to place estimated peak flows into a context for evaluating risks. Thus, the Washington State manual states,

"The significance of the estimated changes in peak flows must be related to the likelihood of delivering adverse impacts to public resources" (C-37, "Effects of Peak Flow Changes on Public Resources").

If increased peak flows have affected stream channels in these watersheds, it is not apparent in those channels viewed in the field. As indicated earlier in this analysis, channels on BLM lands in the sale area are in functional condition. Impacts to streams further downstream have not been evaluated because they are on private lands.

Public lands in these watersheds are less than 20% of the area, and the Proposed Action is the only remaining forest harvest proposed in these watersheds for this decade. Under these circumstances, a 0.4% increase in unusual storm event peak flows over current conditions is highly unlikely to result in any adverse impact to public resources.

No Action Alternative, Alternative B

Under this alternative the existing water quality conditions, stream flows, and channel conditions at the project site would continue their current trends (see section 3.2.2). There would be no construction or harvesting activity that could result in minor erosion.

Botany

Proposed Action, Alternative A

Special Status / Special Attention Species: There were no Special Status Species identified during the field surveys of the proposed Clear Dodger Timber Sale.

Survey and Manage Species: Due to the protection buffers that have been established around each of the S&M fungi sites located within units B-2 and B-4, no adverse effect to any identified S&M species or the microclimate surrounding them is anticipated.

Noxious Weeds: No significant increase in the noxious weed identified during the field surveys is expected to occur. Any increase that does occur should be short lived due to revegetation by native species in areas of high light and ground disturbing activities.

No Action Alternative, Alternative B

Special Status / Attention and Survey and Manage Species: Under the no action alternative, these species would continue at approximately their current population levels and distribution until some natural disturbance (i.e. fire, wind, overcrowding & stagnation) caused significant changes in habitat conditions.

Noxious Weeds: Would continue at approximately their current population levels and distribution until forest conditions reached a closed canopy wherein there would be insufficient light to sustain noxious weed populations.

Please see the full botany report in the Clear Dodger NEPA file for more detailed information.

Visual Resources

Proposed Action, Alternative A

Units B-4 and B-5: Changes to the landscape character are expected to be low and would comply with Class II guidelines. Some disturbance during and shortly after thinning activities may be observable. This disturbance would be more evident in Unit B-5. Most of the disturbance would be associated with modifications to vegetation. The proposed thinning would maintain some canopy cover and seen portions of the units are expected to return to a more natural appearance within five years as disturbed understory vegetation returns.

There would also be some short-term (days) decline in visual quality as a result of the smoke created if debris piles are burned. The units would be burned in compliance with state smoke management regulations.

Units A-1 and C-1: Changes to the landscape character are expected to be low and would comply with Class III guidelines. Impacts are similar to those described for Units B-4 and B-5.

Units B-1, B-2, B-3 and D-1: Changes to the landscape character are expected to be low and would comply with Class IV guidelines. Impacts are similar to those described for Units B-4 and B-5.

No Action Alternative, Alternative B

With the exception of unplanned changes (i.e. wildfire, disease etc.) no modifications to the landscape character of the proposed units would be expected to occur. Modifications to the landscape character in the general area around the units would still be expected, as a result of harvesting activities on other lands.

Cultural Resources

Proposed Action, Alternative A

All of the proposed units have been surveyed for cultural resources. No cultural resources were found. Since all of the areas have been previously harvested, it is likely that any cultural resources that may have been present were lost at the time of earlier disturbance. It is also possible that in the process of thinning the proposed units, given that more people will be

covering the ground and some of the brush and undergrowth will be disturbed or removed, previously unknown cultural resources may be discovered. All contracts for ground disturbing activities will carry a clause requiring an immediate suspension of all operations upon finding any cultural resources until such time as the BLM is able to evaluate and protect such resources. At the conclusion of thinning operations, portions of the harvested areas would be reexamined for cultural artifacts.

No Action Alternative, Alternative B

With the exception of a chance finding by a forest visitor, any unknown cultural resources would remain unknown and undisturbed.

Air Quality

Proposed Action, Alternative A

There would be some short-term (days) decline in visual quality as a result of the smoke created if debris piles are burned. The units would be burned in compliance with state smoke management regulations.

No Action Alternative, Alternative B

With the exception of unexpected changes (i.e. wildfire) there would be no change to air quality from current conditions. A short-term increase in smoke from pile burning, dust and exhaust from log truck traffic, or other disturbances related to the harvest of the units would not occur

Recreation and Rural Interface

Proposed Action, Alternative A

> Recreational use of the proposed units would be restricted in the short term during the thinning operation. A forest setting would still be maintained, and vegetation disturbed by logging activities would be expected to return within five years. The thinning of the units would open up the stand, which may make it easier to walk through the units. Recreational use of the units behind gates is expected to remain low. There may be slight increases in use of units still accessible by a motorize vehicle. Off-road motorized vehicle use is not expected in increase significantly if roads opened during the thinning process are blocked after operations are completed.

There may be some disturbance to nearby residences associated with logging and hauling activities (weeks).

No Action Alternative, Alternative B

With the exception of unexpected changes (i.e. wildfire or disease), the proposed units would continue provide a forest setting for dispersed recreational activities. A short-term increase in log truck traffic, or other disturbances related to the harvest of the units would not occur. Log truck traffic from other lands in the vicinity would most likely still occur.

CONFORMANCE WITH LAND USE PLANS, POLICIES, AND PROGRAMS

Implementation of the proposed action would conform to management actions and direction contained in the ROD/RMP (*Salem District Record of Decision and Resource Management Plan*), dated May 1995, which is tiered to and incorporates the analysis contained in the RMP/FEIS (*Salem District Proposed Resource Management Plan /Final Environmental Impact Statement*), dated September 1994. The ROD/RMP provides a comprehensive ecosystem management strategy in conformance with the *Final Supplemental Environmental Impact Statement on Management of Habitat for Late-successional and Old-growth Related Species Within the Range of the Northern Spotted Owl* (February 1994), the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* and *Standards and Guidelines For Management of Habitat for Late-successional and Old-growth Related Species Within the Range of the Northern Spotted Owl* (April 1994).

Implementation of the Proposed Action would also conform with the *Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and Other Mitigation Measures Standards and Guidelines (ROD, January, 2001) and the Final Supplemental Environmental Impact Statement for Survey and Manage, Protection Buffers, and Other Mitigation Measures in the Northwest Forest Plan (FSEIS, November, 2000).*

Other documentation guiding this action include the:

Upper Clear Creek Watershed Analysis (September 1995).
Lower Clackamas River Watershed Analysis (1996)

CONSULTATION

In addition to the interdisciplinary team that developed and reviewed this proposed action, the following agencies, organizations, or individuals were or would be consulted:

American Lands Alliance
BARK
Shirley Brown
Cascadia Wildlands Project
City of Estacada
City of Milwaukie Johnson Creek Facility
City of Oregon City
City of West Linn
Clackamas County Board of Commissioners
Clackamas River Basin Council
Clackamas River Water
The Confederated Tribes of the Grand Ronde Community of Oregon
Confederated Tribes of Siletz Indians
Confederated Tribes of Warm Springs
Environmental Protection Agency
Frank Lumber
Freres Lumber Company, Inc.

National Council for Air and Stream Improvement (NCASI)
National Marine Fisheries Service (NOAA Fisheries)
Northwest Environmental Defense Center
Northwest Forestry Association
Oregon Department of Fish and Wildlife
Oregon Department of Forestry
Oregon Natural Resources Council
Oregon Watersheds
Oregon Wildlife Federation
Pacific Rivers Council
Frances Philipek, BLM, Archeologist
Port Blakley Lumber Co., Inc. (Adjacent Landowner)
Portland General Electric
Karen Sjogren
U. S. Forest Service
U.S. Fish and Wildlife Service
U.S. Forest Service
Weyerhaeuser, Inc.

ADDITIONAL REFERENCES

Bailey, J.D. and Tappeiner, J.C.; 1998. Effects of thinning on structural development in 40 to 100 year old Douglas-fir stands in Western Oregon. Forest Ecology and Management. 108:99-113

Hostetler, B.B., and Ross, D.W.; 1996. Generation of Coarse Woody Debris and Guidelines for Reducing the Risk of Adverse Impacts by Douglas-fir Beetle. . Unpublished paper, USDA Forest Service Westside Forest Insect and Disease Technical Center, Troutdale, OR. 6p.

Spies, T.A.; 1998 Forest Structure: A Key to the Ecosystem. Northwest Science, Vol. 72, Special Issue No. 2, pp. 34-39

Tappeiner, J.C., David Huffman, David Marshall, Thomas A Spies, and John Bailey; 1997. Density, Ages, and Growth Rates in Old-Growth and Young-Growth Forests in Coastal Oregon.

LIST OF PREPARERS/INTERDISCIPLINARY TEAM MEMBERS

NAME	TITLE	RESOURCE ASSIGNED	INITIALS	DATE
Sam Caliva	Fuels Specialist	Fuels/Air	SAC	3/19/03
John Caruso	Soils Scientist	Soils Cultural Resources	JC	3/19/03
Terry Fennell	Botanist	Botany, Noxious Weeds	TGF	3/19/03
Laura Graves	Recreation Planner	Visual/Recreation/Rural Interface	LG	3/25/03
Patrick Hawe	Hydrologist	Water Resources	PH	3/13/03
Randy Herrin	Forester	IDT Lead, Plans, NFP Coordination	RH	3/12/03
Jim Irving	**Natural Resource Specialist**	Wildlife	JI	3/19/03
Steve Ditterick	Forest Technician	Engineering	SLD	3/25/03
Dan Schlottmann	Forester	Silviculture	DS	3/25/03
Dave Roberts	Aquatic Biologist	Fisheries/Aquatic Resources	DAR	3/19/03
Dave Rosling	Riparian Ecologist	Riparian Ecology	DER	3/25/03
Michael Barger	Forester	Sale Layout, Logging Systems	MB	3/19/03

Appendix A - Project Design Features

Clear Dodger Timber Sale - ALTERNATIVE A

Management Activity	Unit A1	Unit B1	Unit B2	Unit B3	Unit B4	Unit B5	Unit C1	Unit D-1	Totals
Harvest Method	Commercial Thinning	Commercial Thinning	Commercial Thinning	Commercial Thinning	Commercial Thinning	Commercial Thinning	Commercial Thinning	Commercial Thinning	
Unit Size	20	18	40	10	8	5	38	22	161
Volume per Acre	17	7	12	6	11	11	7	6	9.8
Estimated Volume	340	126	480	60	88	55	304	132	1585
Logging System (acres)									
Cable (no suspension)	0	0	0	0	0	0	0	0	0
Cable (partial suspension)	0	0	0	0	2	1	18	12	33
Ground-based	20	18	40	10	6	4	20	10	128
Site Preparation									
Technique	Pile Burning	Pile Burning	Pile Burning	Pile Burning	Pile Burning	Pile Burning	Pile Burning	Pile Burning	
Fire Trail Construction (ft)	0	0	0	0	0	0	0	0	0
Reforestation									
Stock Type	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Appendix B: Environmental Elements Review Summary

The following table summarizes:

1. Environmental features that the Bureau of Land Management is required by law or policy to consider in all Environmental Documentation (BLM Handbook H-1790-1, Appendix 5: Critical Elements of the Human Environment).
2. Additional resources to be considered based on RMP monitoring efforts. These resources are shown in italics.

ENVIRONMENTAL ELEMENT or ADDITIONAL RESOURCE	EFFECT		REMARKS
	YES	NO	
Air Quality	x		
Areas of Critical Environmental Concern		x	Not present within the project area
Cultural, Historic, Paleontological Resources		x	Surveyed, No resources of concern found
Native American Religious Concerns		x	None were identified during the scoping process
Special Status/Threatened or Endangered Plant Species		x	
Special Status/Threatened or Endangered Animal Species	x		FWS Refercnce Number 1-7-03-F-0008
Invasive, Non-native Species	x		
Prime or Unique Farm Lands		x	
Flood Plains		x	Not present within the project area
Hazardous or Solid Wastes		x	Not present within the project area
Water Quality (Surface and Ground Water)	x		
Water/Fisheries Resources		x	
Riparian Habitat	x		
Wetlands		x	Not present within the project area
Wild/Scenic Rivers		x	Not present within the project area
Wilderness		x	Not present within the project area
Environmental Justice		x	Not present within the project area
Adjacent Land Uses		x	No issues identified in scoping process
Mineral Resources		x	Not present within the project area
Recreation/ Visual Resources	x		
Soil Resources	x		
Vegetation/ Botanical Resources (including late successional habitat)	x		
Fisheries		x	No effect determination
Fuels Management	x		
Forest Productivity	x		
Special Habitats		x	Not present within the project area
Un mapped LSRs		x	Not present within the project area
Owl Critical Habitat Units (CHUs)		x	Not present within the project area

Appendix C - Environmental Consequences for Aquatic Conservation Strategy Objectives (ACSO's)

For the Proposed Action

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.

The *Upper Clear Creek Watershed Analysis* identifies that much of the landscape, including Riparian Reserves, has been altered by past management. The net result is that late-successional stand structure and the habitat it provides is limited across the watershed. It also recognizes that there is a general scarcity of standing and down dead wood in the early stages of decay across the watershed. The snag creation areas that are proposed offer the opportunity to restore to a small part of the watershed some of the stuctural attributes that are lacking due to past management. This added diversity would help to restore some complexity to a simplified Riparian Reserve network.

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. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.

The proposed Riparian Reserve treatments would have little direct effect on connectivity between watersheds due to the discontinuous ownership patterns that exist. However, by restoring stand structural elements that provide habitat and refugia, it is anticipated that it would help to strengthen local within watershed connectivity.

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

The proposed actions would support maintenance and improvement of the physical integrity of aquatic reserves by hastening the development of desired vegetation characteristics adjacent to streams. Where trees were girdled and allowed to fall across and into stream channels under the proposed action they would help restore stream channel, bank and bottom structure. Implementation of best management practices to mitigate impacts to the aquatic system would prevent more than minimal short term damage to the physical integrity of the streams and riparian areas. Blocking several existing road segments under the proposed actions would reduce road related stormflow and assist in restoration of the physical integrity of the streams and riparian areas.

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.

The proposed action would maintain water quality by maintaining full Riparian Reserves without any timber harvest (no tree removal) throughout the entire proposed timber harvest

area. Implementing "Best Management Practices" (BMP) to mitigate any other potential impacts to the aquatic system, and blocking several existing road segments would reduce road related sedimentation and assist in restoration of water quality.

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.

The proposed actions would not prevent or retard restoration of the sediment regime. Post project sedimentation is estimated to be the same or lower than pre-project implementation. Risk of significant sediment inputs are reduced by the employment of Best Management Practices for ground disturbing activities and decommissioning of new roads. Sediment generated as a result of the proposal would be limited in scope, duration, and intensity and would decrease to undetectable levels within two years as natural vegetation recovery takes place.

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

The proposed action would protect habitats with Riparian Reserves, and impacts by sediment are estimated to be minor and short term. Proposed road decommissioning and/or blocking would serve to further improve natural routing of water and reduce the amount of runoff entering streams from road drainage. Peak flows would increase by less than one percent as a result of the proposed action and would not affect the magnitude, duration, or spatial distribution of flows. Trees girdled and allowed to fall into stream channels are expected to aid in retention of sediment and nutrients, as well as increase the supply of instream wood for future routing down the stream channels.

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

Riparian Reserve protection measures would maintain current floodplain inundation characteristics and contribute to the long range restoration of them by developing desirable stand characteristics and stream structure. All meadows and wetlands would also be protected under the proposed actions.

Girdling of trees and allowing them to fall into the stream channels would provide additional instream structure that is expected to aid in water retention which may help to restore the timing, variability and duration of floodplain inundation and increase the water table elevation. No activities associated with the proposed action are expected to have any detrimental effects on the timing, variability and duration of floodplain inundation or water table elevation. The proposed action would not prevent attainment of ACS objectives.

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.

The proposed Riparian Reserve treatments would have no adverse effects on thermal regulation, nutrient filtering, or erosional processes within riparian zones or wetlands due to the small scope of the treatments, the untreated zones along stream channels, and because no materials would be removed from the sites treated. The treatments would help to restore some structural diversity currently lacking on these sites.

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

The proposal would be designed solely for restoring elements of structural diversity to the portions of Riparian Reserves selected for treatment. These attributes would help to provide resources currently lacking or of low quality, and over the long-term, would benefit both aquatic and terrestrial species.

ACSO Number	**For each numbered ACSO, the *no action* alternative would:**
1	- assist in maintaining the current state of landscape scale features, but not provide for restoration
2	- maintain the current quality of connectivity within and between stands and between watersheds and maintain the current rate of developing habitat complexity by having no disturbance within the Riparian Reserves.
3	- support maintenance and eventual improvement of the physical integrity of aquatic systems on federal lands as Riparian Reserves mature.
4	- maintain the existing water quality on federal lands, including any detrimental effects resulting from leaving intact the roads proposed for decommissioning
5	- maintain the existing sediment regime on federal lands, including any detrimental effects resulting from leaving intact the roads proposed for decommissioning.
6	- allow slow improvement of the current streamflow, sediment, nutrient, and wood routing regimes as the forest stands mature. However, existing roads would continue to impact streamflow and sediment routing to streams.
7	- allow some restoration of flood plain inundation through full protection of Riparian Reserves.
8	- maintain the current species composition and rate of developing structural diversity of plant communities. Structural diversity would not develop as quickly as under the Proposed Action and some desirable large tree characteristics may not develop at all.
9	- maintain the current habitat which has been simplified by past management.

Appendix D - Special Status/Special Attention Wildlife Species Known & Suspected

Occurrence	SPECIES & STATUS	HABITAT DESCRIPTION
	INVERTEBRATES	
D	MEGOMPHIX HEMPHILLI **SM/BS** Oregon megomphix (snail)	Conifer/hardwood forest floor, in association with bigleaf maple, duff /litter at low/mid elevations. Common along Willamette Valley floor/Cascades foothills interface. There are known sites in 10S-3E-sections 1, 3, 5 and 11
	HERPETOFAUNA	
P	RHYACOTRITON CASCADAE **BT/SV** Cascade torrent salamander	Prefers small cold streams and springs with water seeping through moss-covered gravel. Most common in mature and old-growth conifer forests below 4000 feet.
S	ANEIDES FERREUS **BT/SU** clouded salamander	Prefers the spaces between loose bark on down logs in forests, forest edges, and clearings created by fire.
S	BATRACHOSEPS WRIGHTI **BS/SU** Oregon slender salamander	West slope of Cascades in Oregon. Prefers down logs and woody material in more advanced stages of decay. Most common in mature and old-growth conifer forests. There are known sites in 10S-3E-sections 1 & 3.
P	ASCAPHUS TRUEI **BT/SV** tailed frog	Cold, fast-flowing permanent springs and streams in forested areas.
S	RANA AURORA **BT/SU** red-legged frog	Common in marshes, ponds, and streams with little or no flow, from the valley floor to about 3000 feet in the Cascades. Populations in the Willamette Valley are of greater concern than Cascades populations.
	BIRDS	
P	ACCIPITER GENTILIS **BS/SC** northern goshawk	Has been observed in Middle North Santiam Watershed at higher elevations, but breeding status is unknown. Rare Summer resident in Cascades. Prefers mature or old-growth forests with dense canopy cover at higher elevations. Winters at lower elevations.
P	HALIAEETUS LEUCOCEPHALUS **LT/ST** bald eagle	Documented to occur in North Santiam Watershed along the North Santiam River. No bald eagles have been observed in the vicinity of the proposal. Prefers large old-growth trees near major bodies of water and rivers for nesting and perching. A bald eagle management area has been designated in section 1 adjacent to unit D-1.
P	STRIX OCCIDENTALIS CAURINA **LT/ST** northern spotted owl	Permanent resident. Two known sites within provincial home range of units A-1, B-1, and D-6. Prefers mature and old-growth conifer forests with large down logs, standing snags in various stages of decay, high canopy closure and a high degree of vertical stand structure.
S	CHORDEILES MINOR **BS/SC** common nighthawk (Willamette Valley)	Open habitats from the valley floor to high elevation clearcuts. Breeding populations of are concern, especially in the Willamette Valley.
S	DRYOCOPUS PILEATUS **BT/SV** pileated woodpecker	Common permanent resident in the North Santiam Watershed. Prefers to nest in old-growth and mature forests. Also forages in younger forests containing mature or old-growth remnants. Requires larger snags and down wood.
S	CONTOPUS COOPERI **BT/SV** olive-sided flycatcher	Uncommon summer resident in more open coniferous forest and edge with prominent tall snags or trees that serve as foraging and singing perches.
S	EMPIDONAX TRAILLII BRESTERI little willow flycatcher **BT/SV**	Common summer resident in North Santiam Watershed. Riparian forests, valley brushlands, clearcuts and early seral forests.
S	SIALIA MEXICANA **BT/SV** western bluebird	Uncommon permanent resident in Willamette Valley and adjacent foothills. Open areas with standing snags, or small farms with diversified agriculture. Nests in natural woodpecker cavities or artificial nest boxes.

	MAMMALS	
S	LASIONYCTERIS NOCTIVAGANS **BT/B/SU** silver-haired bat	Associated with cliff/cave and snag habitat. Forages in a variety of forest habitats and riparian areas.
S	MYOTIS EVOTIS **BT/B/SU** long-eared myotis	Associated with snags and cliff/cave habitat. Prefers older forests. Forages over water and riparian areas.
S	MYOTIS VOLANS **BT/B/SU** long-legged myotis	Associated with cliff/cave and snag habitat. Prefers older forests. Forages over water and riparian areas.
S	MYOTIS YUMANENSIS **BT** yuma myotis	Associated with cliff/cave and snag habitat. More closely associated with riparian areas than the other myotis. Prefers older forests. Forages over water and riparian areas.
P	MARTES AMERICANA **BT/SV** pine marten	Mature and old-growth forests containing large quantities of standing snags and downed logs, in the upper end of Middle North Santiam Watershed. Prefers wetter forests, often near streams.
S	ARBORIMUS LONGICAUDUS **SM** red tree vole	This arboreal vole prefers mid to late seral forests with closed canopies. There are known sites in sections 1, 3 and 5.

KEY

Occurrence:
S = Suspected (highly likely to occur)
D = Documented to occur

Status:
LE = Federal endangered
LT = Federal Threatened
SOC = Species of Concern & Bureau Sensitive
BS = Bureau Sensitive
BA = Bureau Assessment
BT = Bureau Tracking
SM=ROD Survey and Manage
B=ROD Buffer or extra protection species

Appendix E - Determination of Effect for Lower Columbia River steelhead trout, Lower Columbia River Chinook salmon and Upper Willamette River Chinook salmon

Upper Clear Creek Watershed

Table 1. CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS OF PROPOSED ACTION(S) ON RELEVANT INDICATORS FOR THE WILLAMETTE PROVINCE

Administrative Unit: Salem District BLM Basin/Section 7 Watershed: Clackamas; Upper Clear Creek

Project: Clear Dodger Timber Sale (Units A-1, B-1, C-1 & D-1)

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

(-) indicates that there may be a negative effect on this indicator, but no change in functional condition
(+) indicates that there may be a positive effect on this indicator, but no change in functional condition

Water Quality

Temperature

Water temperature would not be affected by any activities included in this proposal due to project design criteria that will prevent the removal of any vegetation that provides stream shade. 'Maintain.'

Sediment/turbidity

- No increased sediment delivery to streams is anticipated as a result of this project for the following reasons:
- No yarding activity would occur within any Riparian Reserves (RR).
- Post-project leave tree densities of approximately 86-140 trees per acre (tpa).
- The semi-permanent new roads proposed for construction are located on relatively flat ground on ridgetops, would be constructed during the dry season and are located approximately 3 miles and 5 miles upstream of ESA listed fish habitat.
- The proposed road decommissioning would be conducted during the dry season, and would be covered under programmatic consultation.
- Timber hauling would be conducted during dry weather conditions to prevent road related sediment from entering stream channels.
- Haul routes on non-paved roads from all of the Units within the Clear Creek watershed are very short (<0.5 mile) with very few stream crossings (total of 4; 3 1st order, 1 2nd order), none of which occur on fish-bearing streams.
- If the culvert is removed or replaced at the intermittent stream crossing on the road that accesses Unit B-1, the work would be accomplished during the dry season. The distance downstream from the culvert to listed fish habitat is approximately 5 miles.
- All of the proposed units are located at least 2 miles upstream of ESA listed fish habitat.
- 'Maintain.'

Chemical Contamination/Nutrients

No activities associated with the project would result in any increase in chemical or nutrient contamination. 'Maintain.'

Habitat Access

Physical Barriers

No barriers to fish migration would be created by implementation of the project. 'Maintain.'

Habitat Elements

Substrate
Large Woody Debris
Pool Frequency

Pool Quality
Off-channel habitat
Refugia

No project activities would be in close enough proximity to stream channels or result in a level of disturbance that would affect any of the above instream habitat elements in the streams within the project area or 2 miles or greater downstream in ESA listed fish habitat. 'Maintain.'

Channel Conditions and Dynamics

Width/Depth Ratio
Streambank Condition
Floodplain Connectivity

No project activities would be in close enough proximity to stream channels or result in a level of disturbance that would affect any of the above stream channel conditions in the streams within the project area or 2+ miles downstream in ESA listed fish habitat. 'Maintain.'

Flow/Hydrology

Peak Flows

The Water Available for Runoff (WAR) modeling conducted for the subwatersheds in which proposed project units are located predicted that for normal storm events, no increases in peak flow (relative to a fully forested condition) are expected under the proposal. For unusual storm events (Q2+) the WAR analysis predicted a potential 0.4% (7 cfs) increase in peak flows as a result of the proposal over current conditions, cumulatively in all the streams in the analyzed subwatersheds. Potential peak flow increases of less than a half percent in all of the streams draining the project area would have no effect on ESA listed fish habitat located 2+ miles downstream of the project area. 'Maintain.'

Drainage Network Increase

The culvert removal proposed in Section 13 near Unit B-1 would restore the connectivity of the intermittent stream that flows through it, but would not change the drainage network increase due to roads because the road would be left in place. The topography along the road is flat and contributes little to road related runoff. 'Restore, slightly.'

Watershed Conditions

Road Density & Location

Construction of 2 sections of temporary ridgetop road is proposed, totaling approximately 2,000 feet, which would result in a slight short-term increase in the subwatershed road density, but would maintain the road density in the long-term.
The construction and decommissioning of the new roads would have no effect on ESA listed fish or their habitat, due to the locations of the roads, the slope gradients that the roads

would be constructed on, and the distance of the roads from ESA listed fish habitat. 'Maintain.'

Disturbance History

The project would not result in an increased level of disturbance. Post-project stand densities would be approximately 86-140 tpa; the only activities that would occur within RR is the removal of a culvert on an intermittent tributary to Little Cedar Creek. No activity would occur in unstable areas or refugia for sensitive aquatic species. 'Maintain.'

Riparian Reserves

The project would have no impact on the function of any RR, other than the potential restorative effect of removing short lengths of road from the upper ends of the RR of 2 1st order tributaries to North Fork Clear Creek. No timber related activity would occur within any RR. 'Maintain.'

Although the project is likely to result in a slight short-term increase in road density, and to have a slight restorative effect on RR, it is expected to have '**no effect**' on Lower Columbia River steelhead, Lower Columbia River chinook or Upper Willamette River chinook.

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

Middle Clackamas River Watershed

Units B-2, B-3 and B-4 are located in the Middle Clackamas River Watershed. The units are located on flat ground at the top of the very steep slopes that descend to North Fork Reservoir. Four small streams drain the flat ground in the vicinity of the proposed units. The streams are all too small and too steep to support fish. Project design features for the Middle Clackamas River Units are very similar to those for the Upper Clear Creek Units (ie. thinning only, no RR activity). However, if project activities were to have any effect on the streams flowing to the reservoir, there would still be '**no effect**' to ESA listed fish species found in the reservoir or the Clackamas River due to the buffering effect of the reservoir.

Appendix F - MAPS

Maps can be found in the document called Clear Dodger Appendix F - Maps.