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ENVIRONMENTAL ASSESSMENT

for the

Scattered Apples Forest Management Project
(EA# OR110-99-07)

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MEDFORD DISTRICT
GRANTS PASS RESOURCE AREA

March 1999

Dear Reader:

We appreciate your interest in the BLM's public land management activities. We also appreciate your taking the time to review this environmental assessment (EA). If you would like to provide us with written comments regarding this project or EA, please send them to me at 3040 Biddle Road, Medford, OR 97504.

I know that people sometimes would like to make comments but would prefer to do so confidentially. Please be aware that comments, including names and addresses of respondents will be available for public review or may be held in a file available for public inspection and review unless you specifically request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must state this clearly state at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations or officials of organizations or businesses will be made available for public inspection in their entirety.

Robert C. Korfhage
Grants Pass Area Manager

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MEDFORD DISTRICT

EA COVER SHEET

RESOURCE AREA: *Grants Pass* FY & REPORT # EA Number OR-110-99-07
ACTION/TITLE: ***Scattered Apples Forest Management Project***
LOCATION: T37S-R5W-Sec 33, 34
T38S-R4W-Sec 19
T38S-R5W-Sec 3, 10, 11, 13, 15, 22, 24, 25, 33, 35
T39S-R5W-Sec 1, 6, 12, 13, 14, 15, 23, 25, Willamette Meridian

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GRANTS PASS RESOURCE AREA
ENVIRONMENTAL ASSESSMENT

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Chapter 1
Purpose and Need for Action

A. Introduction

The purpose of this environmental assessment (EA) is to assist in the decision making process by assessing the environmental and human affects resulting from implementing the proposed project(s) and/or alternatives. This EA will also assist in determining if an environmental impact statement (EIS) needs to be prepared or if a finding of no significant impact (FONSI) is appropriate.

This EA tiers to the following documents:

(1) the Final EIS and Record of Decision dated June 1995 for the Medford District Resource Management Plan dated October 1994 (RMP-ROD);
(2) the Final Supplemental EIS on Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl dated February 1994; and
(3) 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 its attachment A entitled the Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl dated April 13, 1994 (NFP-ROD); the "Northwest Forest Plan".

In addition to the documents cited and tiered to above, the planning of the Scattered Apples project drew from the ideas, information and recommendations of the following documents:

(1) Williams Watershed Analysis (BLM, March 1996);
(2) Applegate Adaptive Management Area: Ecosystem Health Assessment (USDI/USDA September 1994);
(3) Applegate Adaptive Management Area Guide (September 1998);
(4) Applegate River Watershed Assessment: Aquatic, Wildlife, and Special Plant Habitat (June1995);
(5) USFWS Biological Opinion (1-7-98-F-3211, September 1998);
(6) BLM Port-Orford Cedar Management Guidelines (September 1994)

Some confusion can arise from terminology and disparate assumptions that are made about the definitions of terms, even those in relatively common usage. Terms used in this EA follow the definitions of the RMP.

B. Purpose and Need for the Proposal

The broad purpose of the proposed action is to implement the Medford District's Resource Management Plan (RMP). The overall Scattered Apples proposed action is designed to meet a variety of resource and human (social/economic) needs and objectives outlined in the RMP. These include:

- contribution to the Medford District's timber harvest and forest products commitment, thus helping meet the demand for wood products both regionally and nationally and supporting local and regional economies;

- management of the forest land in a manner that will provide for and promote a wide variety of non-commodity outputs and conditions including wildlife habitats, riparian structure and function, sustainable forest conditions, recreation opportunities, maintenance or improvement of water quality, and fisheries.

C. Project Location

The general location of the Scattered Apples Forest Management Project is shown on Map 1: Project Location Map (p. 3). The project area is located within the Williams and Murphy watersheds.

D. Issues Relevant to the Project

A variety of issues and concerns were raised during the initial scoping of this project. These were raised during project scoping by interested individuals or groups outside of the BLM, identified in a restoration proposal by members of the Williams community in conjunction with the Williams Creek Watershed Council (June 1998), by the project planning team and resource area's Interdisciplinary (ID) team or were drawn from some of the documents noted above. For the purposes of this EA an “issue” is defined as an element or concern that is *unique* to the project area and that may need to be given particular, out of the ordinary, consideration in project planning.

The issues identified as pertinent to the project are listed below. Many of these issues were used in the design of the proposed project and alternatives. In some cases an issue raised was considered at the onset by the planning team and then eliminated from further consideration because it was not judged something that was within the scope of the project or proposed action(s). These are summarized in Appendix C. The primary issues identified for this project are:

1. There is great interest in the Williams community for recreational hiking trails.

2. Strong community interest exists in developing strategies that will facilitate economic and recreational opportunities in the Williams community.

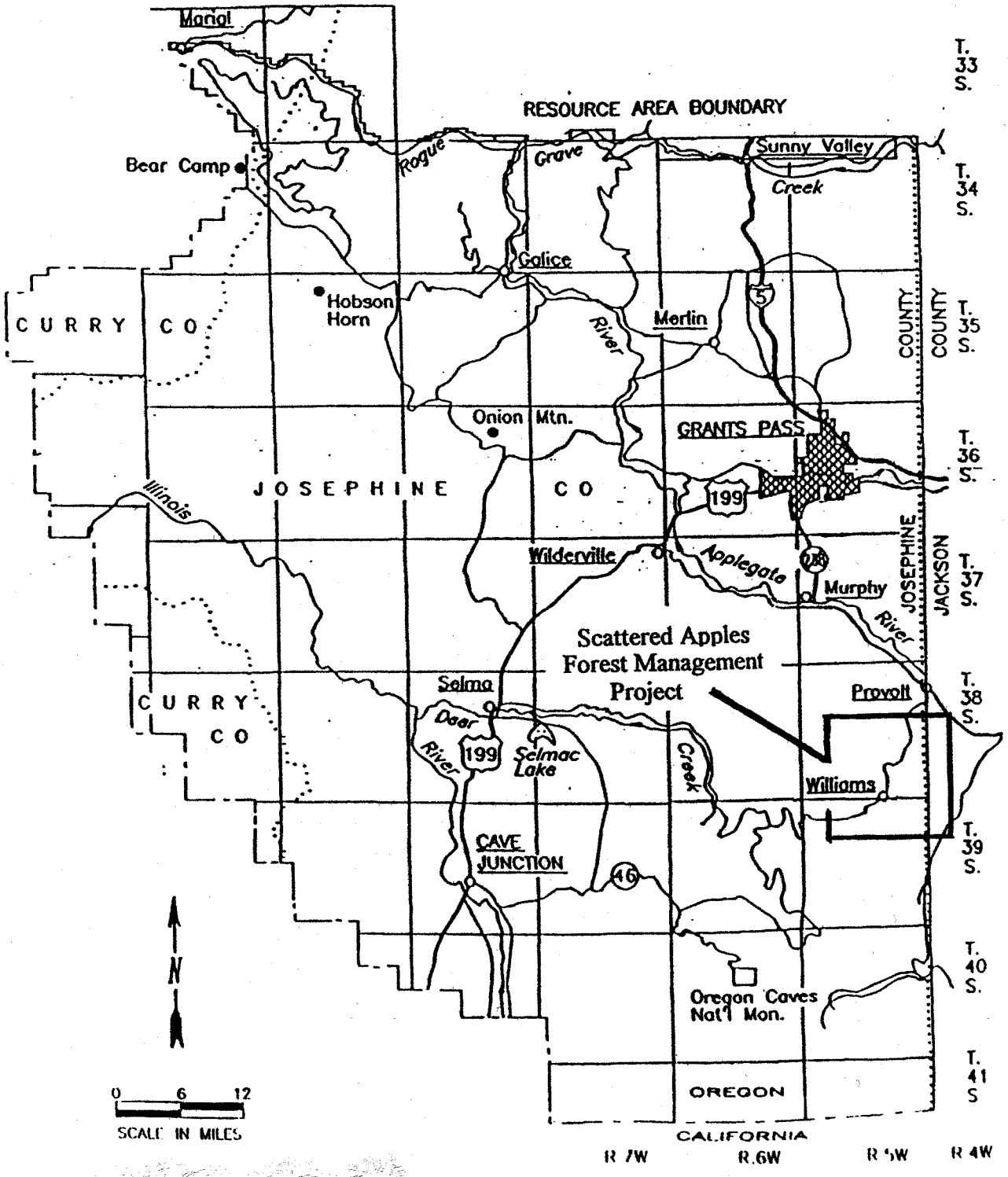
3. Old abandoned mining ditches alter the natural drainage thereby contributing sedimentation to streams and increasing erosion and peak flows.

4. The rock quarry in T39S- R5W-Sec 14 interrupts natural drainage flow. On site erosion creates sedimentation downstream.

5. Connectivity and refugia for low mobility late-successional forest associated species of plants and wildlife across the Williams watershed and Applegate Valley are poor.

6. *Phytophthora lateralis* has been located in T39S-R5W-Sec 23. Live Port-Orford is being lost from the riparian ecosystems here.

Map 1
Project Location Map
Scattered Apples Forest Management Project
T.37S., R.5W., Sections 33,34
T.38S.,R.4W., Section 19
T.38S.,R.5W., Sections 3,10,11,13,15,22,24,25,33,35
T.39S.,R.5W., Sections 1,6,12,13,14,15,23,25



7. Suitable nesting habitat for forest raptors (goshawk, great grey owl, Cooper's hawk, and northern spotted owl) is limited on the east side of the Williams Valley.

8. Past management activities have increased current densities of noxious weeds (cheatgrass, starthistle) in T38S-R5W-Sec 24, 25, 35 and T39S-R5W-Sec 1, and along Rd 39-5-2 and Scotch broom (*Cytisus scoparius*) densities in T39S-R5W-Sec 23.

9. Extremely high tree densities resulting from past fire suppression, within ponderosa pine and white oak stands, are resulting in decreases in the amounts of both ponderosa pine and white oak and also in vigorous Douglas-fir stands.

10. Lands within the Scattered Apples Forest Management Project area are considered moderate to high in fire hazard and risk assessment (Williams WA, p.64).

11. High road densities in T38S-R5W-Sec 3 and T39S-R5W-Sec 23 contribute to soil erosion, reduce water quality and diminish wildlife habitat quality.

12. Erosive granitic soils are found are in T38S-R5W-Sec 24, 33 and T39S-R5W-Sec 14. T38S-R5W-Sec 25 is dominated by Vannoy and Manita soils that are a source of fine sediment when duff surface is exposed.

13. 4x4 activity, vandalism to gates and trash dumping are occurring in T38S-R5W-Sec 3 and T39S-R5W, Sec 1, 14 and 15.

14. Road access to some of the project area is presently limited. This affects the potential for small sales, special forest products and stewardship.

15. The Williams watershed is an identified Elk Management Area (RMP). However, elk habitat is in poor condition in the Williams watershed. Winter range condition has been identified by Oregon Department of Fish and Wildlife as one of the limiting factors influencing population of elk in the watershed.

E. Land Use Allocation Objectives

Land Allocations are set forth in the NFP and RMP-ROD (pg.36-37). The reader is referred to these documents for discussion of the broader objectives specific to each of the allocations and which form the foundation for the present project. The current project is located within the Applegate Adaptive Management Area (AMA) and is also located within the Riparian Reserve Allocation.

Chapter 2
Proposed Actions and Alternatives

A. Introduction

This chapter describes the proposed actions and alternatives that are addressed and analyzed in this EA.

B. No Action Alternative

In this EA document, the "no-action" alternative is defined as not implementing any aspect of the proposed action alternative(s). Defined this way, the no action alternative also serves as a baseline or reference point for evaluating the environmental effects of the action alternatives. Inclusion of this alternative is done without regard to whether or not it is consistent with the Medford District RMP.

It should be pointed out that the no action alternative is not a "static" alternative. Implicit in it is a continuation of the environmental conditions and trends that currently exist within the project area. This would include trends such as vegetation succession and consequent wildlife habitat changes, the spread of *Phytophthora lateralis*, road deterioration, rates of erosion, continuation of current road densities, trends in fire hazard changes, and OHV use.

C. Proposed Actions and Action Alternatives

1. Introduction

This section of the EA describes a series of project proposals which together comprise the Scattered Apples forest management project. It is organized and presented based on broad “types of action” (*e.g.*, recreation-related proposals, road actions, riparian treatments, fisheries enhancement, vegetation treatments). Proposals are grouped this way to better present the comprehensive nature of the Scattered Apples proposal and to facilitate understanding and analysis of the project. While presented in these discrete groupings, their interrelationship must be kept well in mind particularly in considering the potential environmental effects.

Within each type of action, a proposed action is described. In some instances, alternatives are presented. In others, only a proposed action. The counterpoint to all of the proposed actions is the no action alternative described above. It should be noted that during the design and planning phase of the different proposals that comprise the Scattered Apples project, a host of alternatives are considered. Many of the concerns and issues that initiated alternatives and alternative uses of resources were subsequently resolved during the planning and the alternatives disappeared as the final proposal emerged. In some instances the alternatives were retained, developed and carried forwarded, such as is the case for the vegetation treatment alternatives. Some of the more significant alternatives that were considered during the planning process but eliminated from the proposal or further evaluation are summarized in Appendix C. Those alternatives carried forward are described in this section.

Both the proposed actions and the alternatives are based on the issues presented in Chapter 1 above and the land allocation objectives from the RMP and NFP.

The project design features noted in this next section are, where applicable, common to all of the action alternatives.

2. Recreation Development Projects

a. Project Planning Objectives

There is community interest in developing hiking and recreational trails. The Scattered Apples project planning objectives included the creation of new trails, providing low elevation easily accessible recreation opportunities, capitalize on the historical interest of the old mining ditch (Chinaman's Ditch) and working with the community of Williams in developing trails.

b. Description of the Proposed Action

The proposed action for Recreation Development includes two elements: 1) The Scattered Apples Interpretive Trail and, 2) Chinaman's Ditch Trail. The Grayback Trail is a related trail project, however, it will be evaluated in a separate Environmental Assessment, not as a part of the Scattered Apples project.

1) *The Scattered Apples Interpretive Trail* in T38S-R5W-Sec 33 (see map 2 - Appendix A): The Scattered Apples Interpretive Trail would be approximately 1 mile long with a loop. It would be open to hiking and mountain biking. No motorized use would be allowed. Interpretive signs would be placed along the trail that interpret treatment and non-treatment units in section 33 adjacent to the trail. Interpretive themes would include: pine site enhancement, soil slumping, granitic soils, fuels treatments, understory and overstory thinning, no treatment areas, and low elevation old-growth forests.

This trail will be built using hand tools such as shovels, axes and pulaskis. The trailhead will be located along Rd. 38-5-33 in the NW1/4of the NW1/4 of the section. The trail will be cleared of brush to a horizontal width of 2 - 3 feet each side of center line and 10 feet vertically. The tread width will be approximately 1.5 ft. Implementation of this would be reliant upon local community participation.

2) *The Chinaman's Ditch Trail* on the east side of the watershed. The old Layton mining ditch, commonly known and referred to hereafter as "Chinaman's Ditch", will be developed into a recreational hiking trail. The ditch begins in T39S-R5W-Sec 28 (see map 2) near Rock Creek and winds around the mountain sides through hot, dry, south slopes, through Douglas-fir/ponderosa pine forests and riparian areas for approximately 13 miles in the east half of the Williams Watershed. It ends in T38S-R4W-Sec 30. The ditch runs through both BLM and private land. Completion of the entire length of the Chinaman's Ditch Trail will require the participation of private landowners and acquiring legal access for the public.

The present EA addressed all segments of the trail on BLM land (approx. 9.5 miles). However, only the segment between points A and B (see map 2) would be developed initially. This is the longest contiguous segment on BLM land (3.4 miles). Access for this section of the trail, which is on BLM land, would be from Panther Gulch Road in T39S-R5W-Sec 1.

Creation of this trail is linked with some aspects of the fuel hazard reduction component of the Scattered

Apples project. Its initial developmental work will be done as part of the fuels hazard reduction treatment with the purpose of providing an anchor point for wildfire suppression. Trail development and maintenance, subsequent to that completed by fuels treatments, will be done with the use of mechanized equipment, hand tools, and chainsaws in cooperation with the BLM and volunteer efforts.

The existing structure and integrity of the ditch would be maintained to the greatest extent possible while protecting its cultural and historical value. The ditch berm would be used as the trail path. Only in draws where the berm is creating problems (*e.g.*, existing collapsed berm (blowouts), potential blowouts, and water pooling or stream diversion by the ditch) would the berm be removed. This would allow the drainage flow to return to its natural course. Motorized use would be prohibited.

3) *Grayback Mountain Trail* - Although this trail is located within the project area (T39S-R5W-Sec15, see map 2) it will be developed and analyzed in a separate EA. The total route of the Grayback Mountain Trail would be 6.5 miles, beginning in Clapboard Gulch and connecting with the Boundary Trail on Forest Service administered land. The proposed trail head is at the end of Rd. 39-5-15.1. This trail would be open to hiking and horseback riding.

3. Quarry Restoration in T39S-R5W-Sec 14

This quarry is currently used as a rock source. However, it interrupts the natural drainage flow from an intermittent stream and producing sedimentation downstream during peak flow events. An existing drainage culvert near the quarry entrance is ineffective due to inlet blockage by a rock stockpile.

a. Objective

The objective here is to restore drainage to normal flow conditions thereby reducing erosion.

b. Description of the Proposed Action

The proposed action is as follows:

- Reconstruct stream channel, armor with drain rock
- Re-grade quarry floor to divert runoff toward the stream channel
- Replace damaged pipe
- Clean existing culvert catch basin
- Remove down spout and install splash pad at culvert outlet
- Grass seed and mulch all disturbed areas (excluding quarry floor)
- Blade to remove ruts on road near the quarry entrance

4. Unique Vegetation / Habitat Restoration / Enhancement Treatments

a. Treatment Purpose and Objectives

These elements of the project are intended to maintain a vigorous representation of the unique habitats and vegetation types present in the project area. Proposed treatments of these habitats will promote or

enhance biological diversity and ecosystem health, which in turn contribute to healthy wildlife populations.

Elk Habitat - The Williams watershed has been identified as an Elk Management Area (RMP pg. 48, map 7). One of the overall goals of this area is to enhance elk habitat consistent with the objectives of other allocations. The majority of quality habitat is found on the east side of the Williams valley.

Brush lands - The vegetation types in some of the project area are shrub fields such as ceanothus and manzanita. These brush fields have become decadent and dense primarily from the exclusion of fire and have limited foraging access for a variety of wildlife species. Palatability of the forage is currently low.

Pine, Oak Woodland and Meadows - Douglas-fir, along with other conifer and shrub species are encroaching upon the pine, oak woodland, and meadow vegetation types. The exclusion of fire has contributed to this encroachment, which reduces the meadow edge and nesting cavities for certain birds and wildlife. This vegetative condition also increases the fuel levels and the fire hazard.

Great Grey Owl Habitat - There is a unique assemblage of great grey owls in T38S-R4W-Sec 19, T38S-R5W-Sec 25, and T39S-R5W-Sec 1. These birds forage in both the woodlands and grasslands. Rejuvenation of these vegetation types and habitats would improve forage conditions.

The specific objectives for this aspect of the Scattered Apples project include:

- Maintain and restore pine, oak and grassland habitat, meadows and wetlands
- Reduce fuels and fire hazard.
- Improve foraging quality (*e.g.*, elk, great grey owls, rodents).
- Protect great grey owl habitat in 38S-4W-Sec 19, 38S-5W-Sec 25, and 39S-5W-Sec 1.
- Maintain and enhance big game (elk) habitat by protecting or improving big game winter range through rejuvenating senescent forage with prescribed fire
- Retain optimal thermal cover (>70% canopy closure) within 1/4 to ½ mile of burn area to protect big game during inclement weather, both hot and cold

b. Description of the Proposed Action

The proposed action for unique vegetation / habitat restoration / enhancement treatments contains three elements: 1) Thinning Douglas-fir and oaks on pine sites, 2) Slashing conifers and shrubs on oak/grasslands and, 3) Burning in shrub fields and meadows. The locations of these proposed actions are shown on Table E-2 (Appendix E) and on Maps 4-6 (Appendix A).

1) *Thinning Douglas-fir on pine sites* will occur as described in the silvicultural prescription (available on request). Smaller oaks will also be thinned to promote the growth of the larger, fuller crowned oaks. This will help preserve and enhance the oak woodland vegetation type and habitat, which is utilized by a unique community of plant and animal species.

2) *Conifers and oaks would be slashed on oak/grasslands*. This targets conifers and shrubs that are encroaching on the edge and into the grasslands and will improve the great grey owl foraging quality.

Around meadow edges and meadow interior, slashing would insure the removal of seed sources and maintain the meadow in a grass and forb vegetation condition.

3) *Prescribed burning of shrub fields and meadows* (wildlife burns). Broadcast and hand-pile burning would be employed to setback and rejuvenate decadent shrub fields, and to re-establish grass meadows from conifer and shrub encroachment and rejuvenate grass growth. This will restore wildlife habitat by: a) improving deer and elk browse and forage quality; and b) improving travel corridor conditions for a variety of plant and animal species.

4) *Meadows*. Meadows in Section 39-5-15 would receive a 100' no-treatment buffer.

5. Fire and Fuel Treatments

a. Treatment Objectives

Prescribed fire and fuel treatments are designed to meet the vegetation management objectives, improve wildlife habitat, and to reduce fuel loadings and the risk of wildfires. Slashing of understory vegetation and prescribed fire use shifts competitive advantage for nutrients and water to residual individuals by reducing competing vegetation with understory conifers. It can also reduce competition induced mortality of overstory pine and hardwood species. Size limits on slashing are designed to limit the impacts on these species and to retain their presence in the stand.

b. Description of the Proposed Action

The proposed action for Fire and Fuel Treatments includes two elements: (a) prescribed fire for habitat enhancement, fire hazard reduction and presuppression planning and, (b) reduction of fuels produced by the proposed vegetation treatments. The locations of these proposed treatments are identified on Table E-2 (Appendix E) and shown on Maps 4-6 (Appendix A).

1) Prescribed Fire

Prescribed underburn is a low intensity burn over a majority of the burn area. It is employed both in areas where other vegetation treatments have been implemented and in otherwise untreated stands. It creates a “mosaic burn” effect which will result in up to 20-30% of the total burn treatment area with minimal to no fuel consumption. This prescription reduces the loss of large woody debris, organic matter, and any conifer regeneration present. Burning would occur at any time in the year in which fuel moisture and weather conditions enable this type of burning. Characteristically these conditions would occur in the spring.

Wildlife Habitat Restoration Prescribed Burning Treatments (Wildlife Burns) - These treatments include the use of prescribed broadcast burning and hand piled slash burning to setback and rejuvenate currently decadent shrub fields, to rejuvenate meadows (reduce conifer and shrub encroachment) and maintain oak/grassland maintenance. Treatments may include some slashing of shrubs and trees to create a fuel bed that optimizes available fuel, allowing for burn operations to be conducted in the wetter season of the year. This slashing would cut portions of the shrub field to create a uniform pattern of dead and down fuel.

Presuppression planning fuel treatment - The Chinaman's Ditch Trail will be brushed and thinned for the purpose of wildfire suppression. The ditch provides ready access (in places the only access) along its length for wildfire suppression forces and acts as an area where wild fire intensity could be effectively reduced. Fuels reduction treatment area would be 100-300 ft. above the ditch and 50-100 ft. below the ditch. Where the ditch is within approximately 300 ft. of the ridge top, the ridge top will be used as a fuel break. Areas of high brush density and potentially hazardous fuels such as manzanita, deerbrush, and whitethorn will be brushed according to fuel types, slope, aspect and proximity to urban interface. Thinning for fuel reduction will be spaced at 14 x 14 ft. to 20 x 20 ft. Brushing and thinning will be done by chainsaws. Development of the ditch as a recreational hiking trail is linked to this purpose as well.

2) Fuel Hazard Reduction in Vegetation Treatment Areas

Understory Thinning - This treatment leaves 15 - 20' spacing between understory trees. Trees and shrubs between 1" and 6" in diameter would be treated. Trees between 6" and 12" in diameter would be girdled where they exist in excessive numbers.

Hand piling - Fuel 1- 6" in diameter and greater than 2' in length will be put into piles. Piles will be covered and burned in the fall and winter seasons after 1+" of precipitation.

6. Special Forest Products Program

a. Introduction

The project area includes many currently high density stands where the tree sizes are in the lower range of merchantability. While needing density reduction to maintain/enhance stand growth and vigor, the commercial value of these trees is low, precluding economical harvest with most conventional logging methods, contract types and established markets. BLM's Special Forest Products (SFP) program has also experienced increasing demands for specialty items such as manzanita products, herbs, and mushrooms.

The Scattered Apples project can mesh well with the strong local interest in the Williams community for developing strategies to use special forest products and resources to contribute to the economic base of the community.

b. Program Objectives

Several objectives are identified:

- Investigate contracting methods and low impact harvesting techniques employing the local communities. The current process for managing vegetative resources predominantly involves contracting; either commercial contracts or appropriations for service type contracts if deemed non-commercial. A hybrid form of contracting, involving both commercial and service contracts over a longer time frame, appears to be a method to achieve the goal of effectively implementing landscape and ecosystem management. This is defined as Stewardship. An increased number of

acres of the landscape may then be placed into their natural range of variability in an efficient and timely manner.
- Provide avenues (areas, product sales, contracting options) that encourage the use of the available SFPs.
- Mesh the SFP program with the fire hazard reduction activities.
- Couple the SFP program with the other vegetation treatments to either accomplish them or to utilize the materials cut (where possible and consistent with the requisite treatment time lines).
- Where treatments are low capital intensive treatments, provide and use a variety of BLM contracting strategies to accomplish them.

c. Description of the Proposed Action

The proposed action of the Special Forest Products Program includes two elements: 1) contract development - stewardship, small sales contracts and service contracts and, 2) public purchase opportunities.

1) *Contract Development* - All units designated Density Management/SFP are shown on Maps 4-6, Appendix A and under the Comments column in Table E-2 (Appendix E), and should be considered available for inclusion in newly developed contracts. Contracting officials will continue to develop and test treatment/commodity combination contracts via purchase order, purchase cards, stewardship contracts, and indefinite quantity/level of difficulty methods. Contract performance time will be designed with longer time frames (up to 8 years) in order to offer economic opportunities to as many individuals in the AMA as possible, while still meeting our forest health objectives. The BLM will promote special areas for SFP production from units identified as small sales in Table E-2.

2) *Public's Purchase Opportunities* - Firewood, manzanita, poles and other SFPs would be made available for purchase in smaller quantities where possible and in conjunction with the proposed vegetation treatments (see Table E-2, Appendix E) and to the extent compatible with the available access.

7. Road / Transportation Projects

Road treatment proposals address both roads that would be used to support the vegetation/land treatments of the Scattered Apples project and additional roads in the project area that need some special attention.

a. Description of the Proposed Action

The proposed road work expected to be associated with timber harvest activities is outlined in Table 2-1. Road work proposed for special projects but not expected to be associated with timber harvest activities is shown on Table 2-2. See also Map 2. The tables list the roads that would be used, constructed, improved, renovated, and decommissioned as a part of this project. Definitions of proposed road work follow Table 2-2. Roads with proposed work, that are not to be used as a part of the proposed vegetation treatments will be accomplished in the future as funding is available.

Table 2-1: Proposed Road Use, Maintenance, Construction, Improve, Renovate, Decommission and Closures of Roads used for Haul

Road Number / Road Segment	Road Control	Total Length (miles)	Current Condition / Surface type	Miles of Proposed Treatment:				Comments	Proposed Closures and Decommissioning
				Main-tenance	Construc-tion	Improve / Renovate	Decom-mission		
38-4-17 [A]	BLM	0.47	17' BST	0.47				Maintenance	-
38-4-17 [B]	BLM	0.76	15' ASC	0.76				Maintenance	-
38-4-31	BLM	0.56	14' Natural	0.56		0.56		Improve drainage, Maintenance	-
38-5-3	BLM	2.65	17' Natural	2.65		2.65		Maintenance - Improve drainage and spot rock. Out slope road prism from station 0-40, construct drainage dips, armor dips with 11/2" minus surfacing. Improve drainage from station 40 to end of road.	-
38-5-3.5	BLM	0.63	17' Natural	0.63				Maintenance	-
New spur at end of County Road: 38-5-10 (NE 1/4)	BLM	0.10	14' Natural	0.10	0.10		0.10	Construct approx. 0.10 miles of new road to link with existing East/West spur, road maintenance on East/West spur. Maintenance	Install fence with gate at beginning of new road to control access onto BLM, full decommission following treatment
38-5-11 NW1/4 Spur at unit bottom	BLM	0.25	12' Natural	0.25			0.25	Maintenance	Full decommission following project work
38-5-15 [A]	BLM	0.53	20' BST	0.53				Maintenance	-
38-5-15 [B]	BLM	0.27	20' BST	0.27				Maintenance	-
38-5-15 [C]	BLM	1.04	20' BST	1.04				Maintenance	-
38-5-15 [D]	BLM	1.04	20' BST	1.04				Maintenance	-
38-5-15 [E]	BLM	0.38	20' BST	0.38				Maintenance	-
38-5-17.1	BLM	2.43	14' Natural	2.43		2.43		Apply surfacing or spot rock as necessary. Maintenance	-
Road off 38-5-17.1	PVT	0.27	14' Natural	0.27		0.27		Blade road, improve access and road grade for haul. Maintenance	-

Table 2-1: Proposed Road Use, Maintenance, Construction, Improve, Renovate, Decommission and Closures of Roads used for Haul									
Road Number / Road Segment	Road Control	Total Length (miles)	Current Condition / Surface type	Miles of Proposed Treatment:				Comments	Proposed Closures and Decommissioning
				Main-tenance	Construc-tion	Improve / Renovate	Decom-mission		
38-5-26 [B]	BLM	0.29	14' Natural	0.29		0.29		Improve drainage, construct water bars on grades exceeding 8%. Maintenance	-
38-5-33 [A1]	BLM	0.91	20' ASC	0.91				Maintenance	-
Road thru 38-5-36	PVT	3.19	14' Nat.	3.19		3.19		Blade and widen road as necessary for access to section 35. Maintenance.	-
39-5-1.1 [A]	BLM	1.14	16' ASC	1.14				Maintenance	-
39-5-1.1 [B]	BLM	1.58	20' ASC	1.58				Maintenance	-
39-5-2 [A]	BLM	0.94	16' ASC	0.94				Maintenance	-
39-5-2 [B]	BLM	2.16	17' ASC	2.16		2.16	2.16	Repair fill failure at MP 0.80. Maintenance	Full Decommission after treatment
39-5-5 [A]	BLM	0.47	16' ASC	0.47		0.47		Scarify road bed, blade & compact. Maintenance	-
39-5-5 [B]	BLM	0.62	14' PRR	0.62				Maintenance	-
39-5-14.1	BLM	0.23	14' ASC	0.23				Maintenance	-
39-5-15	BLM	1.94	17' ASC	1.94				Maintenance	-
Op. spurs off 39-5-15	BLM	Misc.	12' Natural					Maintenance	Full decommission after treatment, revegetate as necessary
39-5-15.1	BLM	0.93	14' ASC	0.93		0.93		Improve existing drainage dips; resurface road with 3/4" minus ASC to a 6" depth. Maintenance	-

Table 2-1: Proposed Road Use, Maintenance, Construction, Improve, Renovate, Decommission and Closures of Roads used for Haul									
Road Number / Road Segment	**Road Control**	**Total Length (miles)**	**Current Condition / Surface type**	**Miles of Proposed Treatment:**				**Comments**	**Proposed Closures and Decommissioning**
				Main-tenance	**Construc-tion**	**Improve / Renovate**	**Decom-mission**		
39-5-23.1	BLM	0.73	14' ASC	0.73				Maintenance	Gate on Rd. 39-5-14.2 to be moved to designated location just above private drive at MP 0.35
39-5-23.2	BLM	0.93	14' ASC	0.93			0.69	Install temporary bridge/culvert structures across streams, construct earth berm for PL wash station at junction of 39-5-23.2 and 39-5-23.7. Maintenance	Full decommission of 0.69 miles following treatment
Total Miles:				27.44	0.10	12.95	3.20		

BST=Bituminous Surface Treatment ASC=Aggregate Surface Coarse PRR=Pit Run Rock

Table 2-2: Proposed Special Road Projects

Road Number / Road Segment	Road Control	Total Length (miles)	Current Condition / Surface type	Miles of Proposed Treatment		Comments
				Maintenance	Decommissioning	
38-5-3.1*	BLM	0.14	12' Natural	-	0.14	Full decommission
38-5-3.3	BLM	0.20	17' Natural	-	0.20	Berm barricade and allow to decommission naturally
38-5-3.4	BLM	0.10	17' Natural	-	0.10	Berm barricade and allow to decommission naturally
38-5-3.6	BLM	0.45	14' Natural	-	0.45	Barricade and allow to decommission naturally
38-5-24 - SE/SW landing spur	BLM	0.10	14' Natural	0.10	-	Improve existing water bars (hand work)
Spur road - NW1/4 of 39-5-1	BLM	0.46	14' Natural	-	0.46	Full decommission
39-5-2©)	BLM	0.95	14' Natural	-	0.95	Full decommission
39-5-12	BLM	0.21	14' ASC	-	0.21	Full decommission
39-5-14.1	BLM	0.23	14' ASC	0.23	-	Blade and fill ruts
39-5-14.2	BLM	1.57	14' ASC	-	1.57	Full decommission
Jeep road between 39-5-23.1 and 39-5-2	BLM	0.62	14' Natural	-	0.62	Full decommission following treatment
39-5-23.3	BLM	0.19	14' ASC	-	0.19	Full decommission
39-5-23.6	BLM	0.23	17' ASC	-	0.23	Full decommission first 0..07 miles only
39-5-23.8	BLM	0.33	14' ASC	-	0.33	Full decommission
39-5-23.10	BLM	0.08	14' ASC	-	0.08	Full decommission
Total Miles:				0.33	5.53	

ASC=Aggregate Surface Coarse

* This road is encumbered by a Reciprocal Right-of-Way Agreement requiring contact with the permittee for their support of the proposed action.

Maintenance may include surface blading, roadside brushing for safety, spot rocking and maintaining existing drainage structures. Maintenance of natural surface roads may also include correcting drainage and erosion problems (*e.g.*, improving or installing drainage dips, installing other drainage structures where needed, eliminating outside road edge berms or other features that are obstructing drainage where they exist).

Full Decommission consists of subsoil ripping of the roadbed to promote the establishment of vegetation and promote drainage consistent with the surrounding undisturbed areas. Existing culverts will be removed. Grass seeding of the road prism, fill slope and cut bank, and mulching of the road prism will be included to minimize initial erosion potential prior to natural re-vegetation. An earth berm barricade will be constructed at the beginning of each road to prevent use of the road prism following decommissioning.

Road renovation consists of reconditioning and preparing the sub-grade for heavy truck use, cleaning and shaping drainage ditches and structures, and trimming or removing vegetation from cut and embankment slopes.

Scarification consists of loosening of the top material of the road bed to a depth of 2".

8. Silvicultural / Vegetation Treatments

The proposed vegetation treatments and alternatives are presented in three sections: noxious weed control, riparian reserve treatments and upland vegetation treatments. The treatments and alternatives are shown on Maps 3 through 7 (Appendix A) and outlined in Tables E-1 and E-2 (Appendix E).

a. Noxious Weed Control

Starthistle and Scotch broom, both listed as noxious weeds in the Medford District RMP, are common in the project area.

Scotch broom (*Cytisus scoparius*): Where it occurs along that portion of road # 39-5-23.2 proposed for decommissioning, after subsoiling the road surface the plants would be manually pulled and burned. Elsewhere along the road it would be pulled and burned.

Starthistle occurs along road #39-5-2 which is proposed for partially decommissioned. The road would be subsoiled to loosen the plants which would be manually pulled and burned. Areas along the road that are not to be decommissioned would have the starthistle removed by spot burning in the spring with a follow up burning or pulling of emerging plants.

b. Riparian Reserve Treatments

Riparian reserve widths will be delineated to meet the interim widths of the NFP-ROD (see the Standards and Guidelines, p. C-30, ROD): 150' on each side of non-fish-bearing streams and 300' along fish-bearing streams. In some of the riparian reserves, where the existing stand conditions are

such that active, as well as non-active, management of the stands is proposed in order to maintain and/or enhance the existing quality of the riparian reserve areas.

Riparian reserves provide habitat and connectivity corridors for wildlife and fish. They contribute to proper stream functioning. In many cases, these objectives may be furthered through treatments that accelerate the restoration of ecological functioning or through no-treatment options where conditions are improving naturally. In each of these situations, there is a trade-off between no-treatment options which do not disturb the riparian areas at all, and treatments that create short-term disturbance with the goal of creating or maintaining healthier ecological functioning in the future.

1) Riparian Reserve Treatment Objectives

The following objectives guided the design of the riparian reserve treatment proposals:

- Accelerate the creation of large trees (provide effective shade, coarse wood, and increase litter (nutrient) deposition into channels and flood plains in the long term).
- Implement *Phytophthora lateralis* control measures within the riparian reserves as needed.
- Emphasize creating and maintaining continuous corridors of intact riparian habitat throughout the drainage.
- Improve degraded habitat through silvicultural actions. Create plant communities that are taxonomically diverse and structurally complex.
- Improve fish habitat conditions through passive (*i.e.*, no treatment) and active recruitment of large wood in Glade Fork and East Fork Williams Creek.

2) Description of the Proposed Action

The proposed Riparian Reserve treatments include three categories: (1) precommercial thinning and understory treatments (included in all vegetation treatment alternatives), (2) thinning of commercial-sized stands (included in vegetation treatment alternatives V-1 and V-4 only) and, (3) *Phytophthora lateralis* control in riparian reserves in T39S-R5W-Sec. 23 (included in all vegetation treatment alternatives). The proposed actions are presented below based on stream classes.

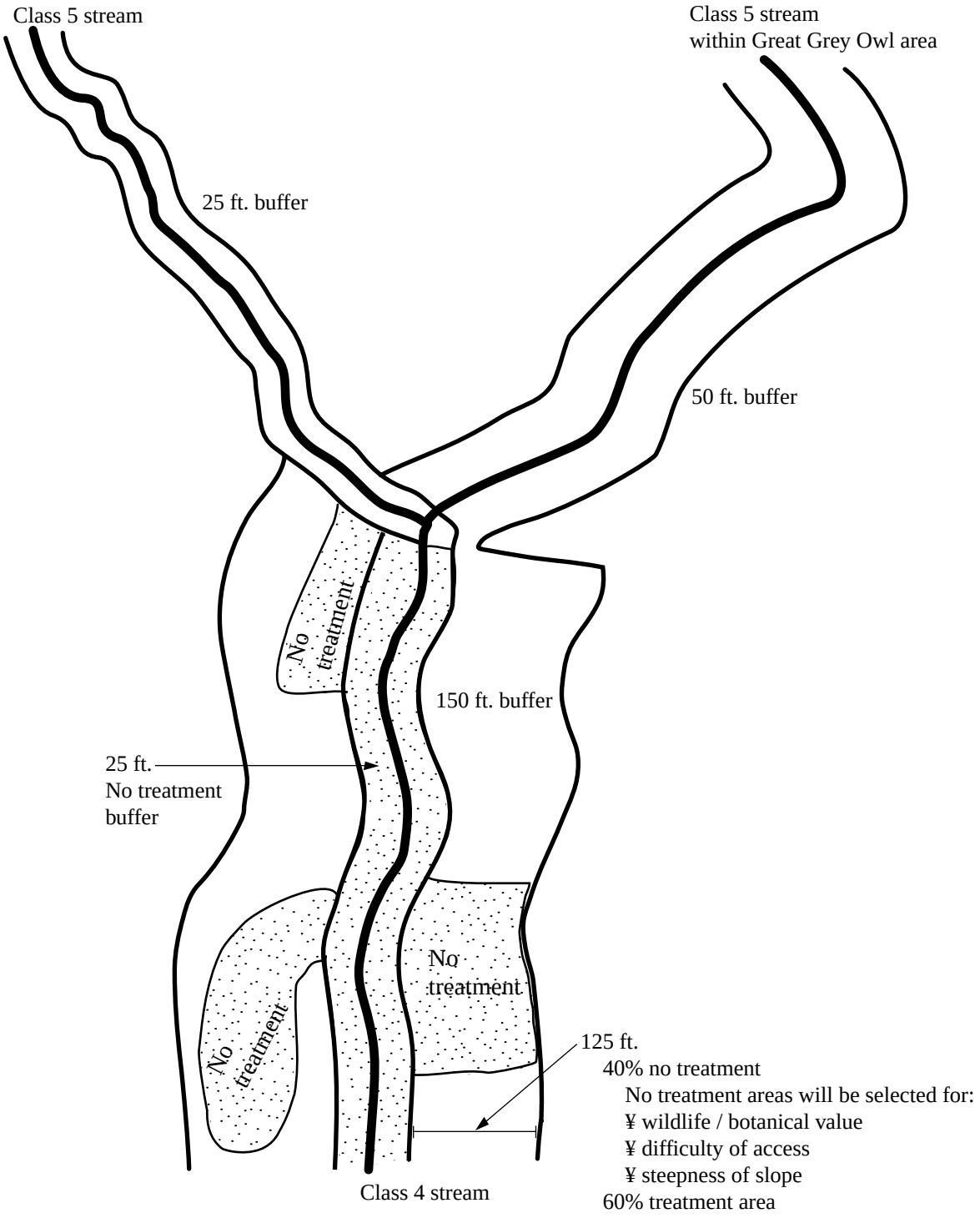
a) Class 1, 2, and 3 streams -

There are no thinning treatments, commercial or precommercial, proposed in the riparian reserves of Class 1, 2, or 3 streams, with the exception of: (1) those areas proposed to be treated to prevent the spread of *Phytophthora lateralis* (see below) and, (2) where East Fork Williams creek crosses Road 39-5-23.5 (T39S-R5W-Sec 23). At the latter location, two infected Port-Orford cedar trees (8" DBH and 20" DBH) will be felled and placed in the stream where they will provide in-stream large wood and create spawning pools for fish.

b) Class 4 streams -

Except in Section 23 where *Phytophthora* control is a treatment priority, Class 4 streams will be treated as follows (See Illustration on the following page):

Riparian Reserve Vegetation
Treatment Illustration
of
Class 4 and 5 Streams



¥ 60% canopy cover will be retained in commercial thinning treatments in riparian areas.
¥ No treatment in old-growth stands in riparian areas.

- Maintain a 25 foot “no treatment” buffer along each side of the streams to maintain bank stability and provide sediment filtration.
- Retain untreated approximately 40% of the riparian reserve area outside the no-treatment buffer to provide for coarse woody debris (CWD) recruitment and riparian vegetation and habitat diversity.
- Treat in the remaining 60% of the riparian area conifers and hardwoods between 1" and 12" DBH, and also the shrubs.
- Plant areas where stocking levels are poor.

The locations of the proposed treatments are shown on Map 3 (Appendix A) and Table E-1. (Appendix E).

(1) Precommercial Thinning and Understory Treatments

Within the treatment areas, understory precommercial thinning and brushing (shrubs and hardwoods) would be conducted where needed. Thinning would space residual conifers and hardwoods 15 to 20 ft. apart. Trees between 6" and 12" DBH would be girdled. Where needed, slash would be hand piled and burned.

(2) Commercial Thinning (Treatment Alternatives V-1 and V-4 only)

- No commercial thinning within old-growth seral stage stands.
- Suppressed, intermediate and some codominant class trees with live crown ratios of < 30% would be the primary candidates for thinning. Thinning is to encourage greater vigor and faster tree growth of the residual conifers. This will reduce the potential mortality due to stand crowding and will hasten the creation of some desirable mature forest conditions.
- Where existing canopy closure (all canopy layers) is less than 60% at the localized site, no overstory thinning treatment would occur (understory treatment may occur).
- All existing snags would be retained to the extent consistent with safety considerations. Buffer snags 17+" DBH from damage by leaving all green trees for a radius equal to the height of the snag.
- Especially on south facing aspects, the emphasis would be to reduce stocking levels of Douglas-fir, increase that of pine species, and create and retain structural diversity.
- Trees from saplings through pole size that would not respond favorably to release would be cut.
- Where possible, leave trees of varying crown classes (height) would be left to create and retain diversity in stand structure.
- All trees larger than 28" DBH would be retained.
- In oak woodlands thinning would retain a minimum of 25 trees/acre.
- In T38S-R4W-Sec 19, T38S-R5W-Sec 24, 25, 35, and T39S-R5W-Sec 1, trees that lean 20+ degrees would be retained where possible for great grey owl fledgling perches
- Coarse Woody Debris (CWD): All existing large diameter down CWD would be retained on site. In riparian reserves of stream segments identified in Table E-1 (Appendix E) as being “deficient” in CWD, trees to be thinned would be girdled and left standing or felled and left as down wood to the extent necessary to provide CWD/snag levels over the long term at densities comparable to those of unentered stands (levels per Bingham and Sawyer (1991) or Jimerson (1989)). The natural recruitment of CWD will be accelerated by cutting and leaving stems in the riparian area.

c) Class 5 Stream -

While not a part of the Riparian Reserve land allocation, class 5 stream channels would receive less intensive thinning treatments than the adjacent uplands. These stream channels contain more moisture in the soil and may have different plant species or different species densities. Class 5 streams serve as corridors for movement of species such as songbirds, amphibians, insects, mollusks, and small mammals. Cover from trees, brush, or forbs creates habitat for mollusks, vascular and non-vascular plants. Class 5 streams naturally have more cover than the uplands.

(*1) Commercial thinning*

- Where commercial thinning occurs, 60% canopy cover will be retained for 25' on each side of the stream channel. (Canopy cover based on all tree species greater than 10' tall.)
- In the great grey owl (GGO) areas of 38-4-19, 38-5- 24, 25, 35 and 39-5-1, 60% canopy cover would be retained for 50 feet on each side of the stream channel. All leaning trees (20+ degree lean from the vertical) would be retained, as would trees supporting or stabilizing leaning trees.
- In 39-5-13 where six class 5 streams are clustered, only one of the six will receive the 25' buffer.

d) *Phytophthora lateralis* control / Port-Orford Cedar Treatment (T39S-R5W-Sec23)

Phytophthora lateralis (PL), the pathogen that causes Port-Orford Cedar root disease, occurs in the riparian reserves along Glade Fork and East Fork Williams Creek in T39S-R5W-Sec23 (see Map 7, Appendix A). The treatment strategy for controlling the spread of Port-Orford cedar root disease includes the following:

- Prevent the spread of *PL* through Port-Orford Cedar exclusion treatments,
- In PL uninfested areas, break up the POC populations so that they are discontinuous.
- POC Roadside Treatments - Create a POC-free buffer area along open roads where there is a high risk of new infection occurring.
- Retain large (greater than 21" DBH) live uninfected POC for both species and structural diversity outside the road side treatment area.
- Underburn PL areas where possible.

Areas where Port-Orford cedar treatments are proposed is shown on Map 7, Appendix A and outlined in Table E-2, Appendix E.

Port-Orford Cedar Exclusion: Within the infested areas (areas where *Phytophthora lateralis* inhabits the soil) of the riparian reserve as shown on Map 7, all POC will be severed or girdled. An infested area generally extends outward from the infection center (an infected tree) a distance of 3 crown radii. Any POC that has a branch overhanging the infested area would be included in the exclusion treatment. Some additional hardwoods and conifers trees in the infested areas which are less than 7" DBH would be cut to the extent necessary to provide sufficient fuel to carry an underburn through the treatment area. Commercial-sized POC could be removed when coarse wood levels exceed target levels (per Jimerson, 1989).

Future treatments in the infested areas may be necessary to keep the host species from reestablishing itself in the infested area (*e.g.*, grubbing or burning of POC seedlings). New *Phytophthora lateralis* sites in the riparian reserve would be treated as described unless new information indicates a potentially more effective approach.

Roadside Treatment (RST): This treatment would be applied along portions of the following roads in section 23 (see Map 7): 39-5-23.2, 39-5-23.5, and East Fork Rd. The objective of this treatment is to provide a buffer area so infested soil or water cannot come in contact with live POC. The roadside treatment area would extend for a maximum distance of 25 ft. up slope of the road and 50 ft. down slope from toe of the road fill. Within this area, all POC would be killed (severed or, if less than 1" DBH, grubbed or burned) as would any POC with branches overhanging this zone. Commercial size POC defined as hazard trees would be cut and removed. Where roads are within the riparian reserve, RST will also be applied.

Prescribed Burning: Prescribed under-burning would be done wherever possible in infested areas. Elsewhere, slash created would be piled and burned.

(1) Alternative POC-1: POC boughs would be harvested in accordance with Special Forest Products program.

(2) Alternative POC-2: POC boughs would not be harvested.

c. Upland Vegetation Treatments

The proposed vegetation treatment alternatives are outlined in Table E-2 (Appendix E). See also Maps 4 through 6 (Appendix A). Table 3-1: Treatment Summary Table (see Chapter 3) summarizes the extent of each of the proposed types of vegetation treatment.

In all instances, density management activities accessed by roads designated for decommissioning will have first priority for completion.

1) Silvicultural Systems

Four silvicultural systems are proposed for use: a) Commercial Thinning, b) Group Selection, c) Structural Retention and, d) Density Management. The objectives for each of these silvicultural system are described as follows:

a) Commercial Thinning

Commercial thinning will harvest timber in a manner that captures wood volume on all size classes of trees and redistributes the growth to residual trees or, in some instances, releases conifer reproduction. Commercial thinning in the Scattered Apples Project is intended to:

- Maintain components of low elevation late-successional habitat.
- Reduce overall tree density to encourage and increase growth of remaining trees.

- Selectively shift species composition away from fire-intolerant species toward fire-tolerant, shade-tolerant species.
- Recover potential mortality while leaving the most desirable, and generally more dominant naturally selected trees in the stand compatible with maximum production. (Maximum production includes stand attributes such as crown development, volume, longevity, and other values such as nutrient cycling and species diversity.).
- Provide a continuing long-term source for large down woody material and snags.
- Maintain untreated pockets within harvest areas for structural diversity on both a spatial and vertical basis.
- Maintain and restore ponderosa pine and white oak stands and increase the vigor of the residual Douglas-fir.
- Create small (1-3 acre) openings that will allow for natural seedling establishment of young ponderosa pine, white oak, and Douglas-fir.

b) Group Selection

Group selection is an uneven-aged silvicultural system in which small groups of trees in all size classes are periodically harvested from larger stands. The openings created by the harvesting would range in size from 1 - 1.5 acres. Location and shape of areas will depend upon the presence of understory areas with releasable conifer reproduction and the presence of single or groups of larger pine trees that will benefit from the elimination of competition from other conifer species. Group Selection is intended to:

- Increase the understory component while retaining much of the original stand structure (spatial and vertical) and biological processes.
- Reduce competition from other conifer species so single or groups of large pine trees (ponderosa and sugar pine) will benefit.
- Recreate the small scale mosaic of seral stages within the mature forest.

c) Structural Retention

The objective of the structural retention harvest system is to regenerate a new stand with a species mix similar to the original natural stand while leaving the larger conifers (16-25 tpa) representing the existing species mix. (Refer to the RMP-ROD, pg. 182 for a further description of the structural retention system.)

d) Density Management

The density management prescription aims to release the younger conifer component of a stand by thinning dense patches of young conifers, slashing competing hardwoods and brush. In most cases this treatment would be irregular, since the vegetative components are not distributed evenly on the ground. Depending on the size and nature of the cut or slashed material, it would be left in place, piled and burned, or removed from the site as forest products such as fuel wood or commercial logs. Density management treatments are intended to:

- Reduce fire hazard.
- Reduce competition for site resources due to overly dense understory.
- Capture wood volume for its economic / product value.
- Redistribute growth to residual trees.
- Develop new or existing canopy layers.

2) Description of Proposed Vegetation Treatment Alternatives

Four upland vegetation treatment action alternatives are presented. These are outlined in Table E-2 (Appendix E) and shown on Maps 4, 5, and 6 (Appendix A). The Design Objectives that differentiate and guided the development of each of these action alternatives are:

a) Alternative V-1

This alternative emphasizes silviculture at the small scale mosaic level that exists with the highly variable vegetation treatment units within the project area. Its goal is to retain much of the existing stand structure and spatial mosaic while providing commercial timber products. Selected conifers and hardwoods would be thinned from all size classes where appropriate to promote growth and diversity. The stand treatments within the harvest units would vary depending upon the local "microsite" conditions of vegetation density, habitats, soils and tree vigor. Most stands under this alternative will be managed to continue their development of multi-canopy, multi-species and multi-age class conditions.

Riparian reserves would be commercially thinned where appropriate (see riparian reserve treatment description above). These treatments would further Objectives 8 and 9 of the Aquatic Conservation Strategy by accelerating the development of structural diversity and habitat along streams.

b) Alternative V-2

This alternative emphasizes the retention of more mature characteristics of the stands than that of Alternative V-1. It retains more of the late-successional stands across the landscape for landscape scale connectivity values. This alternative stems from the current distribution of mature/old-growth habitats across the valley floor: isolated patches due to natural and human-caused conditions which restricts connectivity, dispersal and refugia for late-successional forest species. This alternative is designed to retain and add to all these functions while providing some commercial harvest. The group selection harvest method proposed emphasizes long term stand growth objectives by increasing the understory component while retaining much of the original stand structure and biological processes.

There will be no commercial thinning within the riparian reserves, except for POC root disease control treatments.

c) Alternative V-3

Alternative V-3 emphasizes the retention of high-quality late-successional forest habitat and the rejuvenation and enhancement of other special habitat types where presented in the project area. This alternative retains all the connectivity of Alternative V-2 and selects some additional areas of high-quality late-successional forest habitat for which commercial entry is deferred until some time in the future. Where poorer quality late-successional forest habitat currently exists, stand treatments including commercial harvest would be done to start long term late-successional forest habitat improvement. There would be a deferral of thinning entry in selected stands to allow them to act as wildlife refugia and to maintain future economic viability for harvesting in the project area.

There would be no commercial thinning within the riparian reserves, except for POC root disease control treatments (see above).

d) Alternative V-4

All of the lands being considered for commercial harvest are within the Southern General Forest Management Area (SGFMA) designation. Objectives on SGFMA lands center around producing a moderately high level of sustained timber productivity, providing connectivity and habitat retention, and retaining ecological functioning (RMP, p. 38). The SGFMA states that the structural retention prescription would be applied in instances where a stand is greater than 150 years of age or, if it is 120 - 150 years old and of poor vigor and deteriorating. (Commercial thinning would be the priority for stands <150 years old.) The objective of the structural retention harvest system is to regenerate a new stand with a species mix similar to the natural stand that was harvested over the last several decades or that would have occurred without fire exclusion while leaving a residual stand of larger conifers (16-25 tpa) representing the existing species mix. (Refer to ROD, p. 182 for a description of the structural retention system.)

Structural retention is a final harvest, therefore leave trees would be selected primarily for their ability to provide long term stand structure, whereas in the commercial thinnings proposed in alternatives V-1, V-2 and V-3 leave trees are selected for growth potential. The seral stages will change from mature or mid to emphasize early stages of stand development. A consequence of this is the inclusion of more site preparation, planting, follow up maintenance brushings and subsequent precommercial thinnings than for the other vegetation treatment action alternatives.

Riparian reserves would be commercially thinned where appropriate (see Riparian Reserve treatment description above). These treatments would promote Objectives 8 and 9 of the Aquatic Conservation Strategy by accelerating the development of structural diversity and habitat along streams.

Reference cited:

Jimerson, T.M.. 1989. Snag Densities in Old-Growth Stands on the Gasquet Ranger District, Six Rivers USFS PSW Forest & Range Experiment Station, , Berkekely, CA. 12p.

D. Project Design Features

Project design features (PDFs) are included in the proposed action for the purpose of reducing anticipated adverse environmental impacts which might stem from the implementation of the proposal. The PDFs noted below would be a part of all of the previously outlined alternatives, unless otherwise noted.

1. Logging Systems

a. All systems

Chainsaw operations located within one-quarter mile of residences will operate at the same hour and day limitations as listed below under helicopter operating time.

All harvested trees would be limbed in the units prior to yarding. This is to reduce the extent of damage to the residual stand and to reduce soil disturbance.

All natural surface landings constructed during the logging operation would be ripped to a minimum depth of 18" with a wing-tooth ripper or subsoiler, seeded with an erosion control grass and legume mixture or native grass seed, if available, and straw mulched upon completion of the harvest activity and before the onset of the rainy season.

No new skid roads or new stream crossings will be located within riparian reserves, except the part of the riparian reserve that is north of road #38-5-3. Within riparian reserves, trees will be directionally felled to pre-existing skid roads.

On areas of granitic soils with slopes greater than 20% place waterbars at BLM standard spacing.

Logs will not be dragged from areas infested with *Phytophthora lateralis* through areas un-infested. This is to lessen the risk of spreading *Phytophthora lateralis*. All logging activities would be scheduled so that infested areas will be treated last. All mechanical treatments within non-*Phytophthora lateralis* areas will be completed prior to beginning mechanical treatments in areas having *Phytophthora lateralis*.

b. Ground-based logging

To reduce the extent of ground disturbance and soil compaction, tractor yarding equipment would be limited to the smallest size necessary to do the overall job. Tractors would be equipped with integral arches to obtain one end log suspension during skidding. Equipment would be restricted to approved skid roads. In T39-R5-Sec. 23, only pre-existing skid roads will be used. Tractor logging would generally be restricted to slopes less than 35%, although operations may be permitted on short pitches which exceed 35%. Tractor-type logging equipment would not be authorized when soil moisture content, at a six-inch depth, exceeds 25% by weight as determined by a Speedy Moisture Meter.

Designated skid roads would be water-barred in a manner appropriate to the slope and soil type. Skid roads would be blocked with an earth berm barricade where they intersect haul roads. Main skid roads would be ripped with a winged-tooth ripper or subsoiler and waterbarred shortly after yarding is completed to reduce the erosion potential.

The ripped skid roads would be planted with trees in areas which are proposed for planting, seed with native grass, when available, and mulched. In other areas the ripped skid roads will be allowed to seed in naturally.

c. Cable yarding

In cable yarding units, step landings would be permitted only if all other options are exhausted. Cable yarding corridors would be water barred when needed and at a spacing appropriate for the slope and soil type.

d. Helicopter yarding

Helicopter operation will be restricted to the hours of 7 AM to 5 PM, Monday through Saturday, with Sunday work prohibited.

Map 2 indicates the location of potential helicopter landing sites. Two helicopter landings are planned in the Late-Successional Reserve. These landings are currently of sufficient size and would not be expanded. It is anticipated that no trees would need to be cut around the landings' perimeter although the final determinant of this will be compliance with OSHA safety regulations.

2. Vehicle / Equipment Washing

Prior to entering a POC area or leaving a *Phytophthora lateralis* area, all vehicles, tractors, skidders and yarders involved in road work or harvest operations will be washed in accordance with the BLM Port-Orford cedar Management Guidelines. This includes washing every time a vehicle leaves an infested site or enters an uninfested site. Washing will occur at designated washing stations only and must be approved by the BLM. The washing station is shown on Map 7. Water used at these stations would come from a source approved by the BLM.

Vehicle and equipment washing would not be required of site preparation crews. The alternative for washing for these crews is to have access and egress routes and parking areas designated by the BLM representatives.

3. Seasonal Operation Restrictions

Table 2-3 outlines the seasonal operating restrictions that would apply. The restricted dates set the period of time that the particular activity would be precluded. Some variation of these dates may occur depending on weather and site conditions.

Table 2-3: Seasonal Operating Restrictions			
Location	Restricted Activities	Restricted Dates	Reasons / Comments
Entire project area	*All logging and log hauling operations.*	*October 15 to May 15 of following year*	*Erosion Control. Some variations of the dates depending on weather and soil moisture conditions.*
Entire project area	*Special Forest Product activities*	*October 15 to June 15 of following year*	*Erosion Control. Some variations of the dates depending on weather and soil moisture conditions*
T39S-R5W-Sec 23: Infested POC area	*All operations(including but not limited to logging, log hauling, road work, precommercial thinning, bough collection, pole harvest and brushing*	*October 15 to June 15 of following year*	*P.Lateralis control. Some variations of the dates depending on weather and soil moisture conditions. Due to the limited window for fuels treatments and planting, these activities could occur between October 15 and May 15.*
T38S-R5W-Sec 25: 1/4 mile radius around a known spotted owl nest site. Any other discovered spotted owl nest sites	*All timber harvest activities (felling and yarding), chainsaw operation and prescribed burning*	*March 1 to June 1 (non-nesting)* *March 1 to Sept 30 (non-nesting)*	*Dates and restriction dependent on nesting status.* *(Rogue River/South Coast Biological Assessment, Aug. 1996)*
T38S-R5W-Sec 11, 35 and T39S-R5W-Sec 23: 1/4 mile radius around identified nest site.	*All timber harvest activities (felling and yarding), chainsaw operation and prescribed fire.*	*March 1-15 to Aug 1-31 for osprey.* *March 1 to July 15 for GGO.*	*T38S-R5W-Sec 11, T39S-R5W-Sec 23 Osprey nest sites.* *T38S-R5W-Sec 35 great grey owl nest site. Dates and restriction dependent on nesting status. (BLM Instruction Memo OR-99-36).*
T38-R4W-19, T38S-R5W-25: Adits inhabited by bats. 250' no treatment buffer around adits.	*All timber harvest activities (felling and yarding) and chainsaw operation.*	*Year Round*	*(BLM Instruction Memo OR-96-78).*
Entire sale area - 5 acre no treatment buffer around any raptor nest	*All timber harvest activities (felling and yarding) and chainsaw operation.*	*Variable depending on the species*	*(BLM Instruction Memo OR-99-36)*
All harvest units and road construction ROWs.	*Various activities depending on the species*	*Variable depending on the species*	*Only if special status species are located. (BLM Instruction Memo OR-96-78).*

4. Slash Treatment and Burning

All water used in prescribed fire activities would come from a BLM-approved source that does not contain *Phytophthora lateralis.*

Prescribed burning would be managed in a manner consistent with the requirements of the Department of Forestry's Smoke Management Plan and the Department of Environmental Quality's Air Quality and Visibility Protection Program. Smoke would be managed to preclude intrusion into air quality maintenance areas when air stagnation conditions exist. These conditions are usually described as "yellow" or "red" wood stove advisory days. Additional measures to reduce the potential level of smoke emissions would include: mop-up to be completed as soon as practical after the fire, burning with lower fuel moisture in the smaller fuels to facilitate their quick and complete combustion, burning with higher fuel moisture in the larger fuels to minimize consumption and burn

out time of those fuels, and covering handpiles to permit burning during the rainy season where there is a stronger possibility of atmospheric mixing and smoke dispersal.

All areas planned for prescribed fire treatment that contain sensitive plant species would be burned in the fall season to minimize impacts on plants during active growth. Burning in these areas would be done under conditions that would result in a cool burn to minimize potential damage. No burning would be done within *Cypripedium spp*. buffers.

All harvest units would be re-evaluated following logging or other vegetation treatment to insure that the slash/fuel treatments are appropriate for the post-harvest condition. The fuel treatments noted in Table E-2 reflect the current best estimate of slash treatment needs. Treatments may be changed if it appears that something different would better accomplish fuel treatment and/or site preparation needs while reducing the potential adverse impacts on air quality and site productivity.

Prescribed fire plans include design features to diminish the potential of fire escape from control lines. These features must be in place before burning is permitted to occur. Features include prescribed weather and fuel moisture conditions which produce fire behavior which can be readily controlled by direct attack, specified numbers of people and equipment required for holding forces, and escape contingency requirements such as the availability of backup forces, both locally and regionally.

Prescribed Fire Escape: To prevent fire from escaping control and to minimize potential damage to overstory trees, burning would occur during the late fall to early spring season when weather and fuel conditions allow the least active fire behavior.

Fireline Construction: Firelines are used in broadcast and understory burning. Construction would be accomplished by hand. Waterbarring would be used on all fire trails where slope exceeded 10% to control water runoff and limit potential erosion.

Patrol and Mop-up: Patrol and mop up of burned areas would occur to prevent areas from reburning and becoming escape fires. A helicopter with a water bucket may be used during mop-up to aid in extinguishing larger burning fuels and internal reburning in islands of unburned fuels.

Hand Piling and Burning: Hand piling and burning is designed to remove approximately 50 - 75% of the fuel between 1" and 6" in diameter and greater than 2' in length. Fuel outside this size range is left untreated. However, some smaller fuels are included in the piles to create optimal ignition conditions. Piles are covered to create a dry ignition point and piles are burned in the fall to winter season after more than one inch of precipitation has occurred. Piles are burned during this season to reduce the potential for fire to spread outside each pile and to reduce the potential for scorch and mortality to the residual trees and shrubs. In areas of *Phytophthora lateralis*, piles would be located on top of areas where *Phytophthora lateralis* presence is known or suspected.

Understory Burning or Underburn: Understory burning or underburn is the application of prescribed fire within areas where residual trees and shrubs are present. The prescribed fire objective is to reduce the fuel hazard for both dead and down woody material and to reduce the amount of “ladder”

fuels present. Ladder fuels consist of both live and standing dead vegetation such as shrubs and small trees in the understory and live and dead branches close to ground level on overstory trees. Understory burning is conducted at anytime throughout the year when fuel and weather conditions will permit the successful achievement of resource objectives. Typically burning is conducted from fall through late spring. Summer or early fall burning is less common, but can be feasible when needed to meet resource objectives and when escape fire risk can be mitigated. A Prescribed Fire Plan is prepared that includes both resource and fire objectives. Fuel moisture and weather parameters are developed based on these objectives. The timing of the burn is based on achieving these objectives, occurrence of these parameters, predicted weather, and the availability of adequate fire suppression resources as a contingency plan in the event of fire escape. Prescribed fire effects can include mortality in both the overstory and understory vegetation. The Prescribed Fire Plan includes acceptable mortality levels. These levels typically limit overstory mortality to 10-15% or less, and understory mortality to 20-50% or less depending on resource objectives. When prescribed fire is used to "thin-out" understory vegetation (as opposed to thinning with chainsaws) the higher acceptable percentages of mortality would apply. An underburn treatment prescription can range from burning 30% of the area (a "mosaic" burn) up to 90% of the area. Prescribed underburning is proposed to achieve fuel hazard reduction, POC management objectives in areas where *Phytophthora lateralis* has been identified, and wildlife habitat improvement. Prescribed underburning is designed to be a low to moderate intensity burn (surfaces temperatures up to 300° C). Higher intensity would occur where greater amounts of woody material over 3" in diameter are found. Underburning will occur in the late spring to early summer and/or early fall time periods. Pullback of fuel concentrations around base of residual trees prior to ignition might be utilized where residual tree diameters are less than 10" DBH and fuel amounts around the base of the tree bole are considered excessive.

Understory Thinning would treat conifer and hardwood trees and shrubs. Treatment is to reduce understory vegetation stocking to allow for less competition for nutrients, water, light and to reduce fuel hazard. Leave vegetation would be spaced out to widths ranging from 15 ft. to 20 ft. between understory leave trees. Trees and shrubs between 1 and 6" DBH would be treated. Trees greater than 6" DBH and less than 12" DBH would be girdled where they exist in excessive amounts. All trees greater than 12" DBH are considered reserved trees. Criteria for selection of leave trees is included in the Silvicultural Prescription.

Lop and Scatter is a slash treatment that does not remove fuel. The fuel is cut into smaller pieces and scattered so that it is in contact with the ground surface. This is done to create a fuel bed that would have a slower rate of spread and flame height in a wildfire. This treatment also decreases the time period for decomposition of the woody debris.

Fuel Hazard Reduction/Wildlife Habitat Enhancement are treatments that are designed to reduce both live and dead fuel, lowering the fuel hazard and increasing the value of vegetation conditions for wildlife habitat. The treatments would include thinning vegetation less than 6" DBH to spacing between 15 to 30 feet; hand piling and burning of fuels; or where appropriate, underburning.

Each treatment area would have a specified spacing for both conifer and hardwood trees and for shrub species. The width of the spacing would be determined based on size and species of the vegetation.

In general, the larger the vegetation is, the wider the spacing. Hand piling and burning would be used adjacent to property boundaries and in other areas where use of underburning was not practical at this time. Underburning could be an option for use when an area was away from property boundaries, in mid to upper slope positions, and when vegetation was of a size that would not have unsuitable amounts of mortality.

Alternatives to prescribed burning such as lop and scatter or some form of nonmechanical removal of the material or on-site reduction could be explored on a case-by-case basis.

It is anticipated that these areas would require periodic maintenance treatments to sustain the objectives of this initial treatment. These maintenance treatments could be necessary in 3 to 6 years from the date of initial treatment. Maintenance treatments are not included in this proposed plan and will require planning, project proposal and environmental assessment in the future.

5. Roads - Construction, Improvement, Decommissioning, Renovation, Closure

All new road construction and improvement would be done at the minimum standard appropriate to the intended long term use of the road. Proposed road closures and decommissioning are intended to reduce the potential for erosion and to reduce the impacts on wildlife. Roads proposed for decommissioning that are needed to support prescribed burning, fuel reductions and density management activities would have the decommissioning scheduled after this work is complete. Proposed road closures and decommissioning are intended to reduce the potential for *Phytophthora lateralis* spread, soil erosion, and to reduce the impacts on wildlife.

All roadside brushing would be performed either mechanically with self-powered, self-propelled equipment designed to cut brush, or manually with hand tools including chainsaws.

During road decommissioning, pre-existing landings along roads will be left for future helicopter use.

6. Proposed Dust Abatement

Dust created from log hauling traffic on all roads would be abated in order to reduce driving hazards and protect the fine surfacing materials which bind the road surface rock thus increasing its longevity. Dust abatement would be in the form of water or lignin.

7. Wildlife Trees / Dead and Down Material

All snags greater than 16" DBH would be reserved and protected, unless they pose a safety hazard. Should it be necessary to fell a snag due to worker safety concerns, the snag would be left on the ground. If five years after harvest is completed, it is determined that the District snag target standards are not met, replacement trees of comparable size would be selected to have the tops removed by blasting. (Blasting starts decay in the heart of the tree and removes the tops so the tree is more windfirm.)

All pre-existing down woody material would be reserved from harvest removal. Snags that remain will eventually fall and become downed wood, providing a source for long-term recruitment.

8. Botanical Resource Protection

If Survey and Manage (S&M) species are found (*e.g., Cypripedium fasciculatum, C. montanum*, or *Allotropa virgata*) in a treatment unit, a no harvest, no ground disturbance protection buffer will be implemented with a minimum of 100-foot radius around each population. On *Cypripedium spp*. sites, no slashing or burning would take place. Non-vascular S&M populations would be protected as recommended by regional experts.

If federal or state listed or candidate species or Bureau sensitive species are found, a minimum 100-foot radius no-harvest, no-ground disturbance buffer will be required. For other special status species, a protection buffer size will be determined on a case-by-case basis depending on the species' habitat requirements.

For all protection buffers, trees will be directionally felled away from buffer edges.

Burns in areas containing special status plant species would follow prescriptions that result in "cool" burns which minimize potential damage to plant populations. Prescribed fire operations would be done in a manner which strives to reduce or eliminate burning through identified special status plant population areas depending on the adaptability of each species to fire. Prescribed fire contracts would articulate the necessary steps to reduce or eliminate fires in these sensitive areas.

For all helicopter landings, and operator spurs, a protection buffer will be determined on a case-by-case basis depending on the species' habitat requirements.

9. Threatened and Endangered (T&E) & Surveyed and Manage (S&M) Wildlife

Known bat roosts would receive 250' no harvest buffers (ROD, p. C-43). Townsend's big-eared bat maternity sites would receive a 1,000' no vegetation treatment buffer.

Occupied great grey owl nests would receive a 125 acre no treatment nest buffer configured to provide security for the nest and high quality habitat.

Other raptor nests will receive a nest buffer of at least 5 acres per Instruction Memo OR99-036.

Black bear dens will receive a no vegetation treatment buffer of at least 1/4 acre to connect the den to existing bear travel routes.

Unsurveyed talus areas would be treated as if they were occupied by Del Norte and mollusks.

10. Cultural Resource Protection

If historical or prehistorical sites are found within the project area, a determination would be made of the level of protection necessary. Proper protection of adits, old cabin sites and sites with scattered mining remnants would be implemented prior to activity occurrence. Cut trees would be directionally felled away from old mining ditches. Any logging activity around the ditch would be conducted in a manner that protects the integrity of the ditch.

11. Rain Events

During periods of rainy weather, in areas with infested with PL, all operations except slash pile burning would be discontinued until approved by a BLM representative. A rain event is defined as when enough precipitation falls so that puddles appear on a road or roadside ditches are running water or soil moisture exceeds 25% (as measured by a Speedy moisture meter).

Chapter 3
Environmental Consequences

A. Introduction

Only substantive site-specific environmental changes that would result from implementing the proposed action or alternatives are discussed in this chapter. If an ecological component is not discussed, it should be assumed that the resource specialists have considered affects to that component and found the proposed action or alternatives would have minimal or no effects. Similarly, unless addressed specifically, the following were found not to be affected by the proposed action or alternatives: air quality; areas of critical environmental concern (ACEC); cultural or historical resources; Native American religious concerns; prime or unique farmlands; flood plains; endangered, threatened or sensitive plant, animal or fish species; water quality (drinking/ground); wetlands/riparian zones; wild and scenic rivers; and wilderness. In addition, hazardous waste or materials are not directly involved in the proposed action or alternatives.

This project is not located within the Oregon State Coastal Management Zone (CMZ). Unless otherwise noted it has been judged not to have any direct affects on the resources within the management zone nor has it been identified by the State of Oregon's LCDC as a project (by type and geographic location) outside of the CMZ but still needing a consistency review. Thus a consistency determination and review by the State of Oregon LCDC is not needed.

General or "typical" affects from projects similar in nature to the proposed action or alternatives are also described in the EISs and plans this EA tiers to.

B. Site Specific Beneficial or Adverse Effects of the Alternatives

1. Introduction

The Scattered Apples project is almost exclusively located within the Williams watershed. The watershed is within the Siskiyou Mountain range. Portions of the watershed are characterized by steep, rugged and dissected slopes. The lowest elevation is 1,200 feet at the mouth of Williams Creek, and the highest is 6680 feet atop Sugarloaf Peak. Most of the Williams valley is between 2,000 and 4,000 feet. The watershed is approximately 51,971 acres in size: 26,990 acres (52% of land area) administered by the BLM. Josephine County owns 1,670 acres (3.2% of land area), the USFS administers 819 acres (1.5% of land area), with the remainder in private ownership.

Tables 3-1 and 3-2 summarize the acreage of different conditions and treatments pertinent to the proposed vegetation treatment alternatives. It is a summarization of some of the comprehensive treatment proposal information of Table E-2 (Appendix E). It provides some of the context for assessing environmental effects of the Scattered Apples proposals.

Table 3-1: Seral Stage Treatment Effects Summary						
Vegetative Characteristics	*Current Conditions (acres)*		*Scattered Apples Project Area Following Vegetation Treatment Alternatives (acres)*			
	Williams Watershed (BLM Land)*	*Scattered Apples Project Area*	*Alternative V-1*	*Alternative V-2*	*Alternative V-3*	*Alternative V-4*
Early Seral	747	61	61	61	61	399
Mid Seral	9,590	2,849	2,849	2,849	2,849	2,799
Mature Seral	11,660	1,687	1,687	1,687	1,687	1,416
Old Growth	3,815	77	77	77	77	60
McKelvey 1&2	10,838	1,584	567	697	784	567
Oak Woodland	271	705 **	705***	705***	705***	705***
Pine Habitat	2,639	897	897***	872***	794***	814***
High/Moderate Fire Hazard	13,613	2,269	995	1015	987	696

* source: Williams Watershed Analysis. ** Acreage also includes portions of OI units, thus is greater than 271
*** = number of acres of improvement on Oak Woodland or Pine Habitat.

Table 3-2: Treatment Summary
Summary of acres of treatment proposed in each vegetation treatment alternative from Table E-2.

Proposed Treatment	*Alternative V-1 (acres)*	*Alternative V-2 (acres)*	*Alternative V-3 (acres)*	*Alternative V-4 (acres)*
Deferred (unit acres)	0	70	410	0
Deferred (harvest acres)	0	55	195	0
Brushing	691	691	711	671
Pre-Commercial Thin	1,102	1,102	1,172	1,102
Group Selection (GS)	40	95	70	60
Commercial Thin/GS	867	647	477	587
Structural Retention	0	0	0	262
Special Forest Products	1,551	1,551	1,641	1,551
Port Orford Cedar Exclusion	42	42	42	42
Riparian Reserve	64	0	0	64
Wildlife Burn	344	344	344	344
Hazard Reduction Burn	1,108	1,108	1,128	1,48

1. Resource: Soil and Water

a. Affected Environment

This project is scattered on several sections of land located in six operational drainage areas (ODA's), which are small watersheds within the Williams fifth field watershed (WS). In addition, the northern-most part of the project area (most of section 3 and the two 80 acre pieces in sections 33 and 34) are located in an Applegate frontal ODA, Apple Board, outside Williams WS. The ODA's are Lower Williams (Williams Creek from confluence with Applegate River south to a point 0.2 miles north of the south section 23 line), Williams Creek (from Lower Williams Creek upper boundary upstream to a point 0.4 miles south of Williams), Powell Creek (from Water Gap Road crossing east), Swamp Mungers (includes lower West Fork of Williams Creek, Munger and Swamp Creeks), Clapboard Rock (includes lower 2.4 miles of East Fork Williams Creek, all of Clapboard, Rock, and Panther Gulch), and Glade Pipe (includes upper East Fork Williams Creek, Glade and Pipe Forks). Generally, the ODA's are characterized by long, narrow (three upper ODA's) to somewhat wide valley bottoms with moderately steep to very steep ridges on three sides. Highest elevations are generally greater than 6,500 feet. The valley bottom is roughly in the elevation range of 1,150 to 1,600 feet. Main streams meander in the valley bottoms with class 3 and 4 tributaries that flow off the ridge slopes. Annual precipitation (primarily in the form of rainfall with some snowfall at higher elevations), averages 30" in the valley bottom and east ridge slopes to 68" in southern high elevations.

Soils are predominately Beekman-Colestine on steep sloping side slopes and ridge top in project area in sections 25 and 35; Siskiyou and Tethrick on steep sloping side slopes and ridge top in project area in 38-5-24 and 33, and 39-5-15; Brockman and Cornutt-Dubekella on moderate slopes in sections 3 and 37-5-33; Manita on moderately steep and steep slopes in sections 3 and 35 are the most common soils; Vannoy-Voorhies occurs in the remainder of the project area. Beekman-Colestine are moderately deep to deep, well drained, extremely gravelly loam and gravelly loam. Siskiyou and Tethrick are moderately deep and deep, gravelly sandy loam derived dominantly from granitic rock. Brockman and Dubekella are moderately deep, moderately well and well drained, cobbly clay loam and very cobbly clay loam with underlying cobbly clay and very cobbly clay, derived from serpentine. Manita is deep, well drained, loam over clay loam. Vannoy and Voorhies are moderately deep silt loam and gravelly loam over clay loam and gravelly clay loam. These soils have low to moderate forest productivity. Of particular concern are Brockman and Dubekella, clayey subsoil susceptible to disturbance/compaction and limited productivity (low calcium to magnesium ratio) and Siskiyou and Tethrick, both of which are very erosive under bare soil conditions. Tethrick can be subject to instability. Siskiyou and Tethrick commonly have a thin surface duff that need to be maintained in order to protect against erosion and productivity loss. (Source: SCS, Soil Survey of Josephine County)

Williams Creek, from the mouth to East/West Fork confluence, and Powell Creek, from mouth to Blodgett Creek are currently listed as Water Quality Limited (Ref. 1998 Oregon Section 303(d) List), based on warm temperature data (moving 7 day average of daily maximums of greater than 64 degrees Fahrenheit). No other streams in the project area are 303(d) listed. However, other water quality parameters were not tested.

b. Environmental Effects

1) Short and Long Term

The following table (Table 3-3) provides ratings for local effects as compared to current condition for the various practices within the alternatives:

Table 3-3: Comparative Soils Effects

ODA	Term	Type of Effect	No Action Alt.	Alt. V-1	Alt. V-2	Alt. V-3	Alt. V-4
Lower Williams Creek	Short (1-5 yrs)	Disturbance / Erosion	0	Min.-	Min.-	Min.-	Min.-
		Added Compaction	0	0 to Min+**	0 to Min+**	0 to Min+**	0 to Min+**
		Productivity	0	Min.-	Min.-	Min.-	Min.-
		Sedimentation from haul roads	0	Min.-	Min.-	Min.-	Min.-
	Long (5-20 yrs)	Disturbance / Erosion	Slight-*	Min.-	Min.-	Min.-	Min.-
		Compaction	Min.-*	Min.+	Min.+	Min.+	Min.+
		Productivity	Slight-*	Min.+	Min.+	Min.+	Min.+
		Sedimentation from haul roads	Min. -*	0	0	0	0
Williams Creek***	Short (1-5 yrs)	Disturbance / Erosion	0	Min.-	Min.-	Min.-	Slight-
		Added Compaction	0	0 to Min+**	0 to Min+**	0 to Min+**	0 to Min+**
		Productivity	0	Min.-	Min.-	Min.-	Slight-
		Sedimentation from main skid/haul roads	0	Slight-	Min.-	0	Slight-
	Long (5-20 yrs)	Disturbance / Erosion	Slight-*	Min.-	Min.-	0	Min.-
		Compaction	Min.-*	Min.+	Min.+	Min.+	Min.+
		Productivity	Slight-*	Min.+	Min.+	Min.+	0
		Sedimentation from main skid/haul roads	Min.-*	Min.-	0	0	Min.-

Table 3-3: Comparative Soils Effects							
ODA	**Term**	**Type of Effect**	**No Action Alt.**	**Alt. V-1**	**Alt. V-2**	**Alt. V-3**	**Alt. V-4**
Powell Creek	Short (1-5 yrs)	Disturbance / Erosion	0	Min.-	Min.-	Min.-	Min.-
		Added Compaction	0	0	0	0	0
		Productivity	0	0	0	0	0
		Sedimentation from haul roads	0	slight -	slight -	slight-	slight -
	Long (5-20 yrs)	Disturbance / Erosion	Min.-*	0	0	0	0
		Compaction	Min.-*	0	0	0	0
		Productivity	Min.-*	Min.+	Min.+	Min.+	Min.+
		Sedimentation from haul roads	Min.-*	Min.-	Min.-	Min.-	Min.-
Swamp Mungers	Short (1-5 yrs)	Disturbance / Erosion	0	0	Min.-	Min.-	0
		Added Compaction	0	0	0	0	0
		Productivity	0	0	Min.+	Min.+	0
		Sedimentation from haul roads	0	Min.-	Min.-	Min.-	Min.-
	Long (5-20 yrs)	Disturbance / Erosion	Min.-*	0	0	0	0
		Compaction	Min -*	0	0	0	0
		Productivity	Min.-*	Min.+	Min.+	Min.+	Min.+
		Sedimentation from haul roads	Min.-*	Min.-	Min.-	Min.-	Min.-
Clapboard Rock	Short (1-5 yrs)	Disturbance / Erosion	0	Min.-	Min.-	Min.-	Slight-
		Added Compaction	0	0 to Min+**	0 to Min+**	0 to Min+**	0 to Min+**
		Productivity	0	Min.-	Min.-	Min.-	Min.-
		Sedimentation from main skid/haul roads	0	Min.-	Min.-	Min.-	Min.-
	Long (5-20 yrs)	Disturbance / Erosion	Slight-*	Min.-	Min.-	Min.-	Min.-
		Compaction	Min.-*	Min.+	Min.+	Min.+	Min.+
		Productivity	Slight-*	Min.+	Min.+	Min.+	0
		Sedimentation from main skid/haul roads	Min.-*	Min.+	Min.+	Min.+	0

Table 3-3: Comparative Soils Effects							
ODA	**Term**	**Type of Effect**	**No Action Alt.**	**Alt. V-1**	**Alt. V-2**	**Alt. V-3**	**Alt. V-4**
Glade Pipe (POC Treatments included for all Alts.)	Short (1-5 yrs)	Disturbance / Erosion	0	Min.-	Min.-	Min.-	Min.-
		Added Compaction	0	0 to Min+**	0 to Min+**	0 to Min+**	0 to Min+**
		Productivity	0	Min.-	Min.-	Min.-	Min.-
		Sedimentation from haul roads	0	Min.-	Min.-	Min.-	Min.-
	Long (5-20 yrs)	Disturbance / Erosion	Slight-*	0	0	0	0
		Compaction	Min-*	Min.+	Min.+	Min.+	Min.+
		Productivity	Min.-*	Min.+	Min.+	Min.+	Min.+
		Sedimentation from haul roads	Min.-*	Min.+	Min.+	Min.+	Min.+
Apple Board	Short (1-5 yrs)	Disturbance / Erosion	0	Min.-	Min.-	Min.-	Slight-
		Added Compaction	0	0 to Min+**	0 to Min+**	0 to Min+**	0 to Min+**
		Productivity	0	Min.-	Min.-	Min.-	Min.-
		Sedimentation from main skid/haul roads	0	Min.-	Min.-	Min.-	Slight-
	Long (5-20 yrs)	Disturbance / Erosion	Slight-*	0	0	0	Min.-
		Compaction	Min.-*	Min.+	Min.+	Min.+	Min.+
		Productivity	Slight-*	Min.+	Min.+	Min.+	0
		Sedimentation from main skid/haul roads	Min.-*	0	0	0	0

Footnote: Effects ratings: (-) = negative effect; (+) = positive effect; (0) = neutral effect
Min. = minimal, very little, limited to few sites; Slight = little distributed over most affected area; Moderate = mid level;
*Assumes high fire hazard and risk for no action alternative
**"0" for AFP and "Min.+" for DM (assuming existing skid roads designated then decompacted)

The above effects are considered for the proposed vegetative treatments <u>only</u>. All other proposed actions would have a minimal short and long term effect. Trail building would have short term site-specific minimal erosion and sedimentation. The Chinaman's Ditch project would have short term erosion and sedimentation where new breaches are created at natural Class 4 crossings, however this will result in positive effects by reducing long term sediment production and bringing surface flow back to the natural drainage system. The quarry drainage restoration will improve drainage discharge from the quarry by reducing sediment load.

The alternatives should cause no measurable effect on summer stream temperatures because existing shade will be retained over all year round flowing streams. Class 4 streams will have some shade reduction outside the 25 foot no-treatment buffer in the areas where stands younger than old growth (maximum of 60% treatment area, with retention of 60% canopy cover). However, since the stream don't flow during the summer there will be no summer warming effect on year round flowing

streams. The exception to the above may be in the Riparian Reserves within the POC treatment area. However, POC to be treated would die in the near future, thus temperatures would minimally increase without any treatment.

There are steep highly erosive granitic soils (Siskiyou and Tethrick) in 38-5W-24, 33 and 39-5W-15. In forest sites the natural protective duff layer is usually thin (<1"). Handpile burning is proposed in these areas to minimize impacts to the duff layer. Some CT or SFP pole removal is proposed by cable or ground based methods where slopes are 35% or less is proposed.

Proposed Mitigation Measure #1: Wherever granitic mineral soil is exposed by skidding or cabling logs in the above three sections, slash should be scattered on these disturbed areas to provide a minimum of two inches cover.

In predominately section 36 (private land) in the Williams ODA a private road is proposed for hauling. This is a natural surface road that crosses several draws as it descends across a steep side slope. Soils are mapped Beekman-Colestine. The road would be used for Alternatives V-1 and V-4. It is proposed that the road be bladed and widened where necessary. This would increase sediment production levels above the current condition. Since this road is on private land, potential mitigating measures after hauling are very limited.

Proposed Mitigation Measure #2: Prior to using this road for timber hauling, correct cross drainages (waterbars, waterdips or pipes), regrading the surface of the road for drainage and spot rocking as needed.

c) Cumulative Effects

Table 3-4 summarizes the current condition some three hydrologic indicators.

Table 3-4: Summary of current ODA hydrologic indicator conditions

ODA	% Early Seral	% Com-paction	Road Density (mi/sec)	Comments
L. Williams	5	5	4.3	Road density is slightly high, 71% Non-BLM land
Williams	3	4	5.7	Road density is high, 73% Non-BLM
Powell	2	7	5.3	High road density
Swamp Mungers	6	6	8.4	High road density
Clapboard Rock	1	6	7.0	High road density
Glade Pipe	1	5	3.2	Moderate road density but some poorly located roads
Apple Board (Est.)	Low	Mod.	High	65%+ Non-BLM land

Percent early seral represents the areal extent of early seral vegetation on the forest land. The

percentages are low to moderate levels. The hydrologic response to high amounts of early seral vegetation is increased stream yield due to reduction of evapotranspiration rates. *Percent compaction* represents the areal extent of compaction. The above percentages are low to moderate levels. The hydrologic response of high amounts of compaction are increased surface flows due to a decrease in infiltration. It also affects productivity. As density of the subsoil is increased, root growth rates are reduced. *High road density* (miles of road per square mile, or section, of land) correlates to an increase in peak stream flows and slight reduction in low stream flows due to interruption of shallow ground water and routing of flow off the roads to streams by way of the natural drainage system.

(1) No Action Alternative

There would be no added direct cumulative effects from the no action alternative. Indirectly, however, if a hot wildfire were to occur because of current vegetation conditions (a high probability event) it would result in high levels of early seral stage vegetation, additional roads (caused by fire fighting), increased road density, and some addition of soil compaction. This would add to existing conditions.

(2) Road / Transportation proposals

All alternatives include the Road / Transportation proposals. This includes 8.7 miles of road decommissioning. Effects of implementing them on ODA road densities are indicated in Table 3-5.

Table 3-5: ODA Road Density Before and After Road Proposals

Lower Williams	Williams	Powell	Swamp Mungers	Clapboard Rock	Glade Pipe	Apple Board
4.3 / 4.3	5.7 / 5.7	5.3 / 5.3	8.4 / 8.4	7.0 / 6.8	3.2 / 2.9	High / Same

There is a small reduction in the Lower Williams and Williams ODAs that is not apparent due to rounding. Powell and Swamp Mungers have no road decommissioning proposed. Glade Pipe's current moderate density is lowered. The proposed action will reduce roads currently in poor locations along stream channels. Road decommissioning will also lower the chance of spreading *Phytophthora lateralis.* This proposal will cause a very slight reduction in local peak flows that would not be detectable at the 5th field watershed level.

(3) Alternatives V-1, V-2 and V-3

There would be no added cumulative effects due to this alternative. There would be a slight decrease in extent of compaction and no increase in extent of early seral stage vegetation.

(4) Alternative V-4

There would be a slight decrease in extent of compaction. There would be an additional two percent of early seral vegetation in the Williams ODA. This would bring the extent of early seral vegetation

up to a moderate level. There may be a slight increase of yield of Williams Creek in this ODA due to this action.

At the fifth field level, there would be no detectable increases in cumulative effects of surface water quality and quantity for all the alternatives.

2. Resource: Fisheries

a. Affected Environment

The following streams in or adjacent to the project area are fish bearing:

Pennington Creek: Steelhead are present up to the unbaffled box culvert at the Water Gap Road crossing, located at river mile 1.3.
Powell Creek: Chinook salmon occur in the first 0.5 miles, and coho salmon are present to river mile 0.8. Steelhead exist in the first 4.0 miles and cutthroat trout are present in the first 6.2 miles.
Munger Creek: Chinook salmon are present in the first 1.0 miles, while coho salmon and steelhead are located in the first 2.5 miles. Their upstream distribution is limited by a bedrock falls. Cutthroat trout are found upstream of the falls, to river mile 4.5.
Rock Creek: Steelhead occur in the first 1.0 miles and cutthroat trout are in the first 1.5 miles.
Sugarloaf Gulch: Cutthroat trout are present in the first 0.75 miles (almost to the section 15/16 line).
Glade Fork of East Fork Williams Creek: Cutthroat trout are present in the first 1.5 miles, and steelhead distribute to river mile 1.0.
East Fork Williams Creek: Chinook Salmon are present in the first 1.0 miles. Coho salmon are located in the first 3.0 miles. Steelhead occur up to river mile 4.5 (upstream from the Scattered Apples project area). Cutthroat trout are present to river mile 6.0.

The Southwest Oregon Salmon Restoration Initiative identified the Williams Creek Watershed as a core watershed for coho salmon recovery. Coho salmon are currently a threatened species as designated by the Endangered Species Act. Chinook salmon are currently a proposed federally threatened species.

In 1997, the BLM completed stream temperature monitoring in Glade Fork and East Fork Williams Creeks. Water temperatures in Glade Fork and East Fork Williams Creeks are not the limiting factors to salmon and trout survival. The seven day average maximum temperature of Glade Fork of East Fork Williams Creek is 60.5° F. The seven day average maximum temperature of East Fork Williams Creek is 61.3° F. Neither exceed the Oregon Department of Environmental Quality (ODEQ) standard of 64° F.

The Oregon Department of Fish and Wildlife (ODFW) conducted physical habitat surveys in 1995 to assess aquatic habitat condition in Glade Fork and East Fork Williams Creeks. The ODFW has identified habitat benchmarks. The benchmarks are used to determine if a component of fish habitat is a limiting factor in trout or salmon production or survival. Juvenile rearing habitat is a limiting factor in these two streams. Pool depth and frequency is less than desirable. There are inadequate

levels of large woody debris (LWD) within the streams as well. The high amounts of sediment within the spawning gravels limit the survival of trout and salmon eggs.

The following habitat conditions were identified in the surveys and the conditions are compared to the ODFW benchmark standards:

Glade Fork of East Fork Williams Creek is deficient in LWD, pool frequency, and depth, and exceeds maximum allowable sediment levels. There is an average of 12.0 pieces of large wood per 100m. The desirable habitat benchmark is 20 pieces per 100m. The pool frequency is 17.5 channel widths per pool. The habitat benchmark for desirable pool frequencies is eight channel widths (or less) per pool. The average residual pool depth is 0.28 meters. The habitat benchmark is 1.0 meter. Spawning gravels contain 43% sand/silt. This exceeds the maximum allowable baseline for adequate spawning of 15% by 28 %.

East Fork Williams Creek is deficient in LWD, pool frequency, and depth, and exceeds maximum allowable sediment levels. There is an average of 5.6 pieces of large wood per 100m. The desirable habitat benchmark is 20 pieces per 100m. The pool frequency is 16.6 channel widths per pool. The habitat benchmark for desirable pool frequencies is eight channel widths (or less) per pool. The average residual pool depth is 0.41 meters. The habitat benchmark is 1.0 meter. Spawning gravels contain 25% sand/silt. This exceeds the maximum allowable baseline for adequate spawning of 15% by 10 %.

b. Environmental Consequences

1) No Action Alternative

a) Short Term (< 5 years)

Road slumps, failures, and fords would continue. Sediment in the spawning gravels, already exceeding maximum allowable levels, would continue to affect survival and production of salmonids. Chinook and coho salmon, steelhead and resident trout populations would decrease.

Diseased Port-Orford cedar trees would continue to die. The root disease *Phytophthora lateralis,* will spread to other riparian areas and infect mature, healthy POC trees. Many POC trees will probably die alongside Glade Fork and East Fork Williams Creeks within a matter of two years. The canopy closure will decrease and summer stream temperatures would increase. As trout and salmon are cold water dependant species, their production and survival rates in Glade Fork and East Fork Williams Creeks could decrease as a result increased water temperatures.

b) Long Term (> 5 years)

As the seral stages continue to advance in the riparian reserve, the size and amount of wood added to the streams would increase. This would increase pool frequency and depth, and provide rearing habitat for juvenile salmonids and adult holding areas. Additionally, the large wood would hold back additional spawning gravels and diffuse energy during high flood events, thereby reducing stream

scour. As roads begin to grow over and become stable, stream sediment would decrease. Some roads may not revegetate due to the continuous OHV use. Trout and salmon production and survival rates would remain constant. Correspondingly, trout and salmon populations would remain fairly constant, ignoring limiting factors outside of the watershed.

Conifers will grow up and replace the dead POC trees. Eventually, the canopy closure will be restored, and summer water temperatures should begin to decrease within 100 years. Trout and salmon production and survival rates would return to current levels.

2) Proposed Action Alternatives

a) Short Term (<5 years)

The full decommissioning of 8.63 miles of road 39-5-23.2 will reduce potential sediment delivery to Glade Fork Williams Creek. This will reduce the continuous sediment delivery to the creek and will allow the stream an opportunity to flush some excessive sediment from the spawning gravels. The decommissioning of roads 39-5-23.3, 39-5-23.6, 39-5-23.8, 39-5-23.10, and the jeep road between 39-5-23.1 and 39-5-2 will decrease sediment delivery to Glade Fork and East Fork Williams Creeks. The decommissioning of road 39-5-2, and the spur road in the NW 1/4 of T39-R5-Sec. 1 will decrease the sediment delivery to East Fork Williams Creek.

b) Long Term (> 5 years)

Trout and salmon production and survival should increase due to the result of the reduction in sediment from the roads.

c) Cumulative Impacts

The proposed road decommissioning and closures, in conjunction with the gating of 8.64 miles from the POC Williams project, will reduce the amount of OHV usage. Access to natural surfaced roads, especially in the wet season, would be limited. This will reduce sediment delivery from BLM roads as well as from non-BLM lands accessed by the existing roads. Salmon and trout production and survival within the Williams Creek Watershed should increase.

3. Vegetation Treatment Alternatives V-1 through V- 4

a) Short Term

The POC treatment in section 23 will help prevent the spread of *Phytophthora lateralis* to healthy Port Orford Cedar trees in other riparian areas. Mature POC trees maintain stream shade and are important source of woody material for streams, wood which may remain in stream for up to 100 years. The proposed action will create POC snags along Glade Fork and East Fork Williams Creek.

Two POC trees will be added to East Fork Williams Creek. This will improve fish habitat and will increase stream complexity contributing to trout and salmon production and survival improvement.

b) Long Term

The trees will likely remain in stream for many years and will continually provide critical fish habitat.

3. Resource: Vegetation

a. Affected Environment

The vegetation conditions in the watershed today are a result of many years of fire suppression and the replacement of the natural disturbance pattern with human disturbances such as logging, farming, mining and rural development. This has generated two primary areas of concern:

1. Fire suppression has resulted in many of the forests in the watershed reaching densities of trees and shrubs that are not sustainable over time. In addition, fire suppression has shifted Douglas-fir onto what were formerly Ponderosa pine sites or oak woodlands.

2. Past harvest patterns in the watershed have resulted in removal of economically and biologically valuable tree species such as Ponderosa and sugar pine. Also, past harvest patterns have resulted in a pattern of many forest stands with one to two age and size classes.

The vegetative and structural conditions of the forests in the watershed are not constant and have changed frequently with the historic disturbance patterns. Disturbance has played a vital role in creating diverse vegetation types, structures and densities. Fire, insects, disease, periods of drought and the resultant tree mortality have always been components of ecosystem processes and occurred within a range of natural conditions. When forest density, species composition, structure (variety of tree sizes, presence of snags and large down logs, etc.), populations of insects, presence of disease, incidence of stand replacement fire events, and tree mortality occur outside the range of natural conditions, components of the ecosystem process are impacted.

Low moisture regimes and drought conditions coupled with dense stands have created stress conditions over most of the project area. A large concentration of insect-killed trees recently occurred within the project boundary. As a result, a salvage operation was implemented in the early 90's over a large portion of the area. Insect problem areas within the proposed units are currently active and stands are at risk to insect attack due to stressed conditions.

When forests remain at unsustainable densities, a number of trends begin to occur that effect stand health. Stand health is a concern in the Scattered Apples area. Species composition and diversity, relative density, percent live crown ratio, and radial growth are all indicators of how forests can be expected to respond to environmental stresses.

Percent live crown ratio and radial growth are physiological indicators of a tree’s ability to produce food and defensive compounds. Healthy live crowns are essential for healthy trees. When the average live crown ratios of forests drop much below 33%, the canopy’s ability to support vital processes in the tree becomes diminished. Live crown ratios begin to recede as forests remain in an over-dense condition for too long. When live crown ratios are reduced too far, trees are unable to

quickly respond to the release provided by density management thinning and partial cutting management prescriptions may no longer be a forest management option.

Similarly, radial growth rate is an indicator of whether trees have sufficient resources to support vital physiological processes. Low production of stem wood per unit of foliage has been associated with a tree's inability to accumulate reserves or to produce defensive compounds. Stem growth only occurs once the resource demands of foliage and root growth have been met. When trees are not able to produce sufficient photosynthate and defensive compounds, they become increasingly vulnerable to insect and disease attacks.

Past timber harvest patterns in the watershed have tended to simplify forest structures and alter the mix of seral and age class distributions. A high percentage lands in the watershed exists in small (5-11" DBH) and large (11-21" DBH) pole size classes. This amount of one size and structure class does not represent the structural diversity found in the reference condition nor the desired vegetative condition of a diverse landscape pattern of vegetation outlined in the Williams Watershed Assessment. Similarly, fire suppression has contributed to dense pole stands developing over much of the watershed. These have crowded out less shade tolerant mid-seral species such as Ponderosa and sugar pine and oaks. Stands consisting of dense poles or of small diameter trees are more vulnerable to stand replacement wildfire. Past fire suppression has also permitted tanoak to become a much more significant stand component than in the reference condition in many areas of the watershed.

Species such as Ponderosa and sugar pine, California Black Oak and Pacific madrone have historically been important components of the forests. These are considered mid-seral species and to flourish they require the less dense, more open canopy conditions that existed in the forests of the watershed prior to fire suppression.

The amount of federal forest land in the watershed in the watershed that currently exist in a late-successional (mature/old-growth) forest condition is approximately 15,500 acres (Williams Watershed assessment). Approximately 1,700 acres of this is within the Scattered Apples project. A majority of mature forest condition in the watershed is in the Late-Successional Reserves and Riparian Reserves.

Port-Orford cedar is an important shade tolerant conifer species along many streams in northwestern California and southwestern Oregon. It can regenerate under its own canopy, providing stream shading and habitat for a number of wildlife species. Port-Orford cedar series appeared to have the highest species richness of the five primary vegetation series found in northwest California. In areas that have not been logged, stand age frequency shows a dominance by older stands.

Phytophthora lateralis, a pathogen which kills Port-Orford cedar, is currently found in the Scattered Apple project area. *Phytophthora* is an exotic species whose spores are carried by water and infested soil. It is transported by animals, vehicles, people and along streams and in ditch lines during wet weather. Although the pathogen is not threatening the viability of POC as a species, it has the potential to accelerate the death rate of POC. A goal for this watershed is to reduce the spread of the pathogen.

b. Effects of the Proposed Action

Tables 3-1 and 3-2 previously summarized the acreages of the different types of proposed vegetation treatments and also the acreges of different seral stages of vegetation involved.

1) Expected Outcomes for Commercial Thin / Group Selection and Density Management

Commercial Thin (CT) / Group Selection (GS) - Immediately following harvest, these stands will have density levels that are near the preferred carrying capacity of the site. Species composition is well represented with Douglas-fir, ponderosa pine, sugar pine, and incense cedar. Hardwood species occur as an occasional stand component either singly (California black oak, bigleaf maple) or in clumps (madrone, white oak). Tree sizes include seedlings, saplings, and small and large conifer trees. The residual merchantable trees (greater than 8" DBH) are characterized by co-dominant or dominant attributes, such as crown ratios greater than 35%, good growth rates and larger diameters. The mosaic of size classes provides the structural diversity not found in adjacent clearcuts, meadows and brushfields. The reduced crown closure within these stands will range within 25-70%. Basal area ranges from 40-180 ft^2 / acre. The higher crown closure and basal area would occur in areas that are buffered or reserved from harvest. Unentered patches of 0.1 to 3+ acres will be scattered in most of the units to maintain diversity and for wildlife habitat. The larger hardwoods will be reserved. Scattered large conifer trees will be reserved for the future large-stand growth component. Pine sites (areas where mature Ponderosa pine is a dominant overstory component) will be thinned to a relative density approaching 25%. On pine sites most, of the competing second growth component will be removed, creating site conditions suitable to produce and maintain large ponderosa pine. Stage 1 and 2 snags will remain for wildlife. Within the group selection areas this harvest should create openings large enough to promote and establish Douglas-fir or pine regeneration. Conditions should be created so that a distinct canopy layer of reproduction can be formed. A heavier thinning on the south side of the openings will encourage reproduction growth within the group opening.

Density Management - Within the project area, density management will reduce the number of future smaller (8-16" DBH) snags and coarse woody debris (CWD) formed in the short term. The density management treatment will remove suppressed, intermediate, and co-dominant trees. Snags and CWD would have resulted from the natural mortality of suppressed and intermediate trees. The negatives of reduced numbers of smaller snags should be offset over the long-term as larger trees develop quicker. There will be more opportunities for larger diameter snags and CWD in the future.

The proposed harvest and understory reduction treatments in the upland and riparian areas will cause the necessary disturbance to provide growing space for additional canopy layers to form. Crown ratios throughout the stand will be increased over time. Late seral tree species, old-growth Douglas-fir, pine and oak will be favored for retention. Selected hardwoods will be maintained in the stands. Density management, from greater than 0.6 relative density to less than 0.4 relative density, reduces competition between existing trees. As a result, growth rates which are currently slowing will increase. Tree vigor and resiliency to insect and disease attack is enhanced as competition is decreased. Dominant and co-dominant trees will not have to wait until the intermediate and suppressed trees die from competition for an increase in available nutrients, light and water. Larger

trees will develop more quickly. The proposed treatment will result in a variety of stand densities, ranging from free-to-grow conditions to conditions favorable for formation of snags and CWD formation. Existing stands in mature and mid seral stages will be modified by a reduction in canopy closure to slightly less than 40% in harvest areas, but will otherwise remain in the same seral stage classification and may reach the next successional stage quicker. Overall, canopy closures will return to their current levels of greater than 60% within fifteen to twenty years. There will be an increased productivity of these treated lands for future harvest in both the understory and overstory. The next harvest will likely be a commercial thin within the next thirty years.

Deferral Units in Alternatives V-2 and V-3 - Overall stand growth on selected deferral units will continue to slow at its current rate. Loss of pine species in all size classes and large conifers due to competition will continue, but not at the rate evidenced during extended drought periods. Not harvesting here will mean that another area will be harvested during the deferral period to fulfill annual harvest commitments. Deferred units would still be candidates for commercial thin. Deferral of units under Alternative V-2 and V-3 emphasizes a high value for habitat and retains future economic viability for harvesting in the project area. Deferral units could be reevaluated for harvest after more is learned from monitoring great grey owl habitat.

b) Expected Outcomes for Structural Retention Harvest Units

Following harvest entry these stands will maintain a high degree of their existing condition and species diversity. A minimum of 16 green trees per acre greater than 20" DBH will be left to satisfy SGFMA retention requirements. These trees will be arranged both as individuals and as clumps. They will represent all tree condition classes ranging from the largest and full crowned healthy trees to trees showing signs of decay. Species composition will be dominated by Douglas-fir with smaller components of sugar pine, incense cedar, and ponderosa pine. Pine and cedar will dominate near ridge lines, meadows and south or west aspects. Hardwood species will be left except where madrone is dominating the site. Large healthy sugar pine and ponderosa pine will be released to promote their longevity in the stands. Where clumps or pockets of mature sugar pine, Douglas-fir, and ponderosa pine exist, trees will be spaced out to reduce competition. Where possible, dense pockets of conifers 2-4 acres in size with a 70% crown closure will be left to promote big game thermal cover. Dwarf-mistletoe-infected trees will be removed, except if located near draw bottoms. The coarse woody debris goal is a minimum of 120 lineal feet per acre of decay class 1 or 2 coarse woody debris at least 16"x16' and well distributed through the stand. A minimum of 1-2 snags stage 1 or 2 greater than 20" DBH will be left per acre. Poor vigor trees will remain to ensure both required snags and coarse woody debris conditions have been met for the near term. In areas where overstory trees are widely spaced and natural regeneration is adequate, a minimum of 16-25 green trees greater than 20" DBH will be left to fulfill SFGMA green tree retention requirements.

3) Noxious Weeds

Scotch Broom: Under the proposed action, the occupancy of sites with scotch broom will be reduced at least for the short term. Although, mechanical, manual, and thermal (fire) treatments have had limited success in retarding the spread of this species, linking these treatments is expected to adversely affect the plant.

It is unlikely that all the Scotch Broom in section 23 will be removed as a result of the proposed treatment. The potential exists that the plant could persist over time in the absence of additional treatments.

4. Resource: Fire and Fuels

a. Affected Environment

Risk is the source of ignition, be it human or lightning. *Hazard* is defined as the existence of a fuel complex that constitutes a threat of wildfire ignition, unacceptable fire behavior and severity, or suppression difficulty.

A fuel hazard and wildfire occurrence risk rating analysis was completed for the Williams Watershed (1995) and the Murphy Watershed (1997), which included the lands in the Scattered Apples proposed project area. The data includes 6,046 acres of BLM administered lands, and 6,152 acres of private lands, for a total of 12,198 acres.

Wildfire occurrence ***risk*** for all lands in the project area is rated as high overall. Acreage ratings are shown in Table 3-6.

Table 3-6: Fire Occurrence Risk Rating by Acres and Percent for 12,198 Acres of Lands Within the Landscape of the Scattered Apples Project Area EA

CONDITION	HIGH RISK	MODERATE RISK	LOW RISK
ALL OWNERSHIP	72 % 8,766 acres	20 % 2,465 acres	8% 967 acres
BLM OWNERSHIP	47 % 2,820 acres	38% 2,299 acres	15 % 927 acres
PRIVATE OWNERSHIP	97 % 5,946 acres	3 % 166 acres	<1 % 40 acres

The fire risk rating assigned for watershed analysis was determined during field data collection in 1995 and 1997. The current high level of risk is primarily due to human use and historical lightning activity within the project area. Risk is difficult to change or influence through land management activity as it is a function of weather events (lightning) and human behavior. Reducing public access can reduce human-caused fire and affect risk, but reducing access for fire suppression forces can increase fire size and effects. Human use in the future would be expected to increase but the influence in terms of affecting risk is difficult to determine. Therefore, for the purpose of this analysis, risk is considered unchanged for the 20 year analysis period.

Fuel includes dead and down woody debris and live vegetation. The fuel ***hazard*** it creates is dynamic and changes over time and can be altered through land management activities. The natural process of wildfire occurrence prior to settlement in the 1800's prevented large scale fuels build-up. This fire regime was one of frequent, low-intensity surface fires which prevented excessive understory

vegetation development and the build-up of large amounts of dead and down woody debris. With human settlement and the suppression of wildfire, fuels have been allowed to accumulate and dense vegetation has grown unchecked. Fuel hazard will increase over time in the absence of disturbance or land management activities which remove or reduce fuels. Without disturbance, fuel hazard conditions become more uniform and continuous. This increases the potential for large, high severity fire occurrence. Dense, overstocked stands are a contributing factor to large stand replacement fire occurrence due to the closed canopy and ladder fuel presence.

Fire exclusion has decreased the acreage of meadow and oak woodland. These areas historically were fire dependent and maintained. Encroachment by conifers and shrub species have replaced and altered these habitat areas.

Table 3-9 lists the current fuel hazard ratings. These are based on the existing situation at the time of field data collection during the summer of 1995 and 1997.

Table 3-7: Hazard Rating by Acres and Percent for 12,198 Acres Of Lands Within the Landscape of the Scattered Apples Project Area EA Current Condition

	HIGH HAZARD	MODERATE HAZARD	LOW HAZARD
ALL OWNERSHIP	25 % 3,026 acres	30 % 3,652 acres	45 % 5,520 acres
BLM OWNERSHIP	37 % 2,254 acres	33% 2,007 acres	30 % 1,785 acres
PRIVATE OWNERSHIP	12 % 772 acres	27 % 1,645 acres	61 % 3,735 acres

b. Environmental Effects

Projections on future hazard are based on current vegetation conditions and known trends of vegetation development in the plant associations. The trend for the next 20 year period is for increasing vegetation density and/or increasing dead and down fuel accumulation. Management activities included in Alternatives V-1, V-2, V-3, and V-4 are analyzed along with the no action alternative. Future management activity beyond this assessment is unknown, but it would affect the hazard so this assessment assumes no future activity.

Table 3-8 shows the current fuel hazard condition rating by acres and percent for all acres of BLM land within assessment area. It projects the change in hazard over time, short term (5-10 years), and long term (10-20 years) for the No Action Alternative, and Alternatives V-1, V-2, V-3 and V-4.

Table 3-8: Hazard Rating by Acres and Percent for All Lands Comparison of Alternatives Effect on Hazard Rating on the 12,198 Acres Of Lands Within the Landscape of the Scattered Apples Project Area EA			
CONDITION	HIGH HAZARD	MODERATE HAZARD	LOW HAZARD
CURRENT CONDITION	25 % 3,026 acres	30 % 3,652 acres	45 % 5,520 acres
ALT 1: NO ACTION 5-10 YEARS	35 % 4,248 acres	28% 3,435 acres	37 % 4,515 acres
10-20 YEARS	55 % 6,675 acres	14 % 1,753 acres	31 % 3,770 acres
ALT. V-1 5-10 YEARS	25 % 3,108 acres	23 % 2,786 acres	52 % 6,304 acres
10-20 YEARS	37 % 4,474 acres	23 % 2,818 acres	40 % 4,906 acres
ALT. V-2 5-10 YEARS	26 % 3,168 acres	23 % 2,746 acres	51 % 6,284 acres
10-20 YEARS	38 % 4,590 acres	22 % 2,739 acres	40 % 4,869 acres
ALT. V-3 5-10 YEARS	26 % 3,149 acres	22 % 2,742 acres	52 % 6,307 acres
10-20 YEARS	38 % 4,636 acres	22 % 2,689 acres	40 % 4,873 acres
ALT. V-4 5-10 YEARS	25 % 2,995 acres	21 % 2,605 acres	54 % 6,548 acres
10-20 YEARS	36% 4,371 acres	23 % 2,761 acres	41 % 5,066 acres

The following assumptions where used in the assessment of effects of treatments on hazard: The time period maximum of 20 years is considered the longest time interval before further management activity would be prescribed. Treatments which harvest timber or cut vegetation without treating the slash increase the hazard rating to HIGH. Hand piling and burning reduced the hazard rating to LOW in the short term. Density reduction treatments in both the overstory and understory with underburning or hand piling and burning reduce the hazard rating to LOW. Broadcast burning and underburning reduce the hazard rating to a LOW category. Understory treatments in conjunction with prescribed burning are considered beneficial in both the short and long term as the effect of ladder fuel reduction and stocking reduction creates a fuel profile that is less susceptible to fire reaching the tree crowns.

Stands that are not or will not be at or near mature conditions within the 20 year time frame are still susceptible to stand replacement from wildfire events due to conditions such as thin bark, high crown ratios, presence or ability to reestablish ladder fuels, and continued stand mortality. The trend in

these stands is for treated and untreated areas to increase in hazard as vegetation in the understory increases, crown closure occurs, and dead and down fuels accumulate. For those stands that were underburned and are at or will reach mature conditions within the 20 year time frame, it was assumed that these stands would remain in the LOW hazard rating. Stands that are currently younger and in mid-seral stage conditions, and would not have as much down fuel removed (hand pile burn units) increase in hazard by the long term period and return to the HIGH and MODERATE rating categories.

1) No Action Alternative

The No Action Alternative would continue the current trend of increasing the fuel hazard over time. This alternative does nothing to reverse the trend of increasing fuel hazard. With the absence of natural, low-intensity, frequent fire occurrence, dead and down fuels and live fuels will increase over time. The fuels buildup creates conditions that lead to high-intensity, stand replacement fire. The project area as a whole would never be expected to have more than 50 to 60% of the area in a high hazard condition. This is due to the large portion of the project area located within the lower slope positions and valley bottoms. Much of these lands are private ownership, grasslands and cultivated. These would be expected to remain in a low hazard condition.

The current condition has 55% of the area in a moderate or high hazard condition. This increases to 63% within the short time period. Most of the high and moderate hazard lands are located on the middle to upper slope positions in the forested or shrubland areas. The shift to greater hazard condition is a result of the increasing dense stocking, multi-canopy nature of the much of the vegetation in the project area. The trend of increasing high hazard fuel conditions will continue if no hazard reduction treatment occur. High hazard reaches over 50% of the acreage in the 10 to 20 year long-term time frame.

2) Comparison of Alternative V-1, V-2, V-3, V-4

Alternatives V-1, V-2, V-3, V-4: Table 3-9 lists acres of hazard reduction treatment types, by alternative, for each current condition hazard rating.

Table 3-9: Fuel Treatments by Current Hazard Rating for each Action Alternative within the Landscape of the Scattered Apples Project Area EA

ALTERNATIVE	HIGH HAZARD (acres)	MODERATE HAZARD (acres)	LOW HAZARD (acres)	TOTAL (acres)
Common to All Alternatives - Hand Pile/burn	496	518	497	1,511
Common to All Alternatives - Underburn	0	87	144	231
Common to All Alternatives - Lop & Scatter	91	370	36	497
VEGETATION TREATMENT ALTERNATIVES (includes COMMON acres from above)				
Alternative V-1; Hand Pile/burn	496	543	517	1,556
Alternative V-1: Underburn	0	87	144	231
Alternative V-1: Lop & Scatter	448	680	231	1,359
Alternative V-1: Acreage Totals	**944**	**1,310**	**892**	**3,146**
Alternative V-2: Hand Pile/burn	496	543	517	1,556
Alternative V-2: Underburn	0	87	144	231
Alternative V-2: Lop & Scatter	328	620	246	1,194
Alternative V-2: Acreage Totals	**824**	**1,250**	**907**	**2,981**
Alternative V-3: Hand Pile/burn	536	543	497	1,576
Alternative V-3: Underburn	0	87	144	231
Alternative V-3: Lop & Scatter	288	555	211	1,054
Alternative V-3: Acreage Totals	**824**	**1,185**	**852**	**2,861**
Alternative V-4: Hand Pile/burn	496	543	497	1,536
Alternative V-4: Underburn	175	192	209	576
Alternative V-4: Lop & Scatter	288	575	251	1,114
Alternative V-4: Acreage Totals	**959**	**1,310**	**957**	**3,226**

Alternatives V-1, V-2, V-3 and V-4 all have beneficial effects on the fuel hazard condition. Fuel hazard is reduced in both the long and short term under each alternative compared to the No Action Alternative. At the landscape level, harvest and fuel treatment effects on hazard slow the trend of increasing hazard. Percentage of acres in HIGH hazard under the Action Alternatives remain near the current condition (25%) in the short term. The Action Alternatives keep the HIGH hazard at 36 to 38% in the 10 to 20 year long term. The No Action Alternative allows HIGH hazard to reach 35% in the 5 to 10 year short term and 55% in the long term.

There are some differences in the number of acres treated in each hazard condition and fuel treatment type between each alternative. The differences in total acres treated between the four Action

Alternatives vary from 120 to 365 acres. The variations in acres treated and harvest/treatment types creates small differences in the short and long term hazard reduction effect. These differences do not create significant disparities at the landscape level in the amount of hazard reduction. All four Action Alternatives produce nearly equal effect on hazard reduction at the landscape level.

The differences in the number of acres treated and fuel treatment type between each alternative create changes in the hazard condition at the site specific stand locations. The location of the treatments in the project area are significant. The lands within the project area are in the foreground viewshed of the Williams valley and portions of the project area border the LSR lands to the south and west. Project lands to the east are on the hillsides that separate the Williams valley from the Thompson Creek valley. The potential for both wildfire occurrence and stand replacement wildfire within these lands is high and increases over time without hazard reduction treatment. The proposed treatments in Alternatives V-1, V-2 and V-3 do not notably alter the viewshed appearance but they significantly change the fuel hazard condition and reduce the potential for large destructive wildfire within the specific locations. Alternative V-4 has a greater hazard reduction effect then the three other action alternatives. Table 3-10 shows the hazard ratings for BLM administered lands by alternative.

Table 3-10: Hazard Rating by Acres and Percent for BLM Lands 6,046 Acres Of Land Within the Landscape of the Scattered Apples Project Area EA

CONDITION	HIGH HAZARD	MODERATE HAZARD	LOW HAZARD
CURRENT CONDITION	37 % 2,254 acres	33 % 2,007 acres	30 % 1,785 acres
NO ACTION 5-10 YEARS	49 % 2,976 acres	31% 1,890 acres	20 % 1,180 acres
10-20 YEARS	75 % 4,553 acres	9 % 508 acres	16 % 985 acres
ALT. V-1: 5-10 YEARS	30 % 1,836 acres	21 % 1,241 acres	49 % 2,969 acres
10-20 YEARS	39 % 2,352 acres	26 % 1,573 acres	35 % 2,121 acres
ALT. V-2 5-10 YEARS	31 % 1,896 acres	20 % 2,746 acres	49 % 2,949 acres
10-20 YEARS	41 % 2,468 acres	25 % 1,494 acres	34 % 2,084 acres
ALT. V-3 5-10 YEARS	31 % 1,877 acres	20 % 1,197 acres	49 % 2,972 acres
10-20 YEARS	42% 2,514 acres	24 % 1,444 acres	34 % 2,088 acres

Table 3-10: Hazard Rating by Acres and Percent for BLM Lands 6,046 Acres Of Land Within the Landscape of the Scattered Apples Project Area EA			
CONDITION	HIGH HAZARD	MODERATE HAZARD	LOW HAZARD
ALT. V-4 5-10 YEARS	28 % 1,723 acres	18 % 1,060 acres	54 % 3,263 acres
10-20 YEARS	37% 2,249 acres	25 % 1,516 acres	38 % 2,281 acres

Approximately a third of the BLM lands are in a HIGH hazard condition in the short term as a result of the harvest and hazard reduction treatments in the Action Alternatives V-1, V-2, V-3 and V-4. The No Action creates a HIGH hazard on nearly one-half the lands in the same period. In the long term over a third higher acres are in a HIGH hazard condition with the No Action Alternative.

Alternative V-1 This alternative includes 3,146 acres, the second most total acres. It includes treatments on the second most acres of HIGH and MODERATE hazard lands, 2,254 acres. Fuel treatments include mainly hand piling and burning and lop & scattering. Underburning is limited to 231 acres.

Alternatives V-2 This alternative includes 2,981 acres, the third most total acres. It includes treatments on the third most acres of HIGH and MODERATE hazard lands, 2,074 acres. Fuel treatments are very similar to Alternative V-1, mainly hand piling and burning and lop & scattering. Underburning is limited to 231 acres.

Alternatives V-3 This alternative includes 2,861 acres, the lowest in total acres. It includes treatments on the lowest amount of acres of HIGH and MODERATE hazard lands, 2,009 acres. Fuel treatments are mainly hand piling and burning and lop & scattering. Underburning is limited to 231 acres.

Alternatives V-4 This alternative includes 3,226 acres, the highest in total acres. It includes treatments on the largest amount of acres of HIGH and MODERATE hazard lands, 2,269 acres. Fuel treatments include similar amount of hand piling and burning and lop & scattering as in the other alternatives 1,536 and lop & scattering. This alternative would have the highest amount of underburning occurring on 576 acres.

The effects of hazard reduction treatment in the Alternatives V-1, 2, 3, and 4 are beneficial in reducing hazard conditions in both the long and short term. A wildfire occurrence within the treated areas would result in less severe effects due to the reduction in fuel amounts. The removal of dead and down fuel and ladder fuel from the forest areas reduces the amount of fuel available to burn when wildfire occurs in those areas. Wildfire will burn with less intensity, duration, and flame length. The proposed treatments would create areas of lower intensity burning which enable suppression forces opportunities to contain the fire spread. They also provide less fuel to "feed" a large fire and add to its energy. This increases the ability of fire suppression forces to protect forest resources, homes and structures and to limit the size of wildfire. Reducing the size and amount of high intensity burn area

from a wildfire would have a short term beneficial effect in maintaining the forest and visual resources within the watershed, as well as reducing effects on stream and water quality.

3. Road Decommissioning

Road decommissioning reduces access for management projects and wildfire suppression. The ability to conduct future management projects such as hazard reduction, wildlife habitat enhancement, understory density management and others are significantly impaired with the loss of access. Project costs increase, as does the risk of conducting prescribed burning. The effect of the road decommissioning will be to dramatically increase the expense of projects in Sections 14 and 23, T.39S., R. 5 W, or preclude them all together.

Wildfire suppression efficiency is decreased with the loss of access. Initial attack ground forces do not have access to the areas as previously. They can not respond as rapidly or at all to portions of Sections 14 and 23, T.39S., R. 5 W. One effect of road decommissioning will be a increase in the size of future wildfire burned area. The reduction in access will have the effect of decreasing human-caused wildfire risk.

c. Cumulative Effects

1) Alternative 1

The no action alternative allows the continuation of hazardous fuels to build up and increases the potential for large scale, catastrophic fire occurrence. This has the potential to impact both the project area and the adjacent drainage. Large scale catastrophic fire events are natural but have been a rare event within the project area since the turn of the century. The impacts of such an event on visual, wildlife, and forest conditions would be extreme. The percentage of acres that burn in high intensity could range from 30 to 60%, with 20% or less burned with low intensity.

2) Alternatives V-1, V-2, V-3 and V-4

The proposed harvest and non harvest stocking density reduction and fuel hazard reduction treatments in these alternatives would substantially reduce the fuel hazard within the project area. This project complements other hazard reduction work accomplished in the adjacent drainage to the east. Together these can have the effect of significantly reducing the potential for adverse wildfire effects on the larger watershed basis.

When wildfire occurs the potential effects would include a mosaic of fire intensities. A wildfire of 100 acres or larger would exhibit areas of high intensity burning producing total stand replacement, areas of low intensity underburn with little overstory mortality, and areas with a mixture of both extremes side by side. Location of the extreme fire effect areas would be a function of the presence of steep slopes, hot aspects, amount of fuel present, fuel continuity, presence of ladder fuels, and weather conditions at the time of fire occurrence. Vegetation density reduction and fuel reduction treatments will reduce the proportion of burned area in the higher intensity burn conditions. A

wildfire occurrence following these treatments could have less than 20% of the area in high intensity and 50% or more experiencing low intensity burning.

Hazard reduction treatments require future maintenance treatments to retain desired fuel hazard conditions. These future treatments are not included within this assessment. It is anticipated that conditions created under Alternatives V-1, 2, and 3 would require similar future treatments for maintenance. Alternative V-4 would need both hazard reduction maintenance and young stand establishment treatments.

5. Resource: Port-Orford cedar

a. Affected Environment

Fire exclusion and past logging in the project area has resulted in a decline of fire intolerant hardwood species such as madrone, fire intolerant conifers such as pine species and to a lesser extent Douglas-fir. This has been accompanied by a corresponding increase in fire intolerant, shade tolerant species such as tanoak and white fir. This coupled with the loss of large POC due to the introduction of *Phytophthora lateralis* has caused changes in the plant species composition within the Williams watershed. While the discussion here is about tree species, a similar change in species composition of both the shrub and herbaceous layer is also occurring.

Riparian Reserve Vegetation: Large (greater than 21" DBH) POC is a valuable component of riparian systems. The riparian reserves in this project are dominated by hardwoods, small diameter conifers and hardwoods, or POC at risk of infection with *Phytophthora lateralis* or POC that is currently infected with *Phytophthora lateralis*.

Roadside Vegetation: The area adjacent to roads is densely stocked with primarily small (less than 12" diameter) conifers and hardwoods.

Port-Orford Cedar - Incense Cedar - White Alder Association: At the confluence of Glade Fork and the East Fork of Williams Creek (where road #39-5-23.5 crosses East Fork), there an approximately 5-10 acre inclusion of a POC plant community that has elements of the Port-Orford Cedar - Incense Cedar - White Alder association (without white alder, but with red alder and many of the middle canopy and understory species typifying this community). Heretofore, this plant community has only been identified on the Ukonom Ranger District (Klamath National Forest) in California.

All roads that remain open are considered to be at high risk for *Phytophthora lateralis* introduction. Gating roads will not eliminate the risk of new *Phytophthora lateralis* infestations. However, gating roads will reduce the amount of vehicle traffic and by doing so reduce the risk of new *Phytophthora lateralis* infestations. Risk is associated with traffic levels. Reduction of the amount of vehicle use of the road reduces risk. It should be noted that all-terrain vehicles, mountain bikes, motorcycles, horses, and even foot travel can move the pathogen from site to site so while there is less potential for spread of the pathogen, some potential still remains.

b. Environmental Effects

1) No Action Alternative

A continuing decline of POC populations in the watershed would be expected. Stands that are currently infected with *Phytophthora lateralis* will have the infection continue to spread down stream and possibly up hill through root grafting. These stands will continue to provide a source of spores that could be spread to other uninfested stands. Large, live POC could become a increasingly rare part of the forest in the Williams watershed. Upper canopy shading by POC would be removed from various plant communities throughout the watershed. Habitat quality and diversity will continue to be degraded as the infestations continue. The quality, if not presence, of the POC-Incense Cedar-White Alder association in section 23 would be likely diminished.

Currently little is known about species interactions between wildlife and Port-Orford cedar, especially invertebrate species. This will have subsequent effects on the quality of both terrestrial and aquatic habitats with the impact being directly proportional to the percentage of Port-Orford cedar in the area. The more Port-Orford cedar, the greater the effect.

2) Vegetation Treatment Alternatives (all)

a) Short Term

Riparian reserve vegetation: The effects of all treatment alternatives would include an accelerated development of mature/late- successional forest where it does not currently exist. This would be primarily in precommercial thinning areas. Precommercial thinning, brushing, and hand piling would accelerate the development of a closed canopy, conifer dominated stand with an open understory. Multiple effects of precommercial thinning can be expected: the development of mature/late-successional conditions will be accelerated (primary objective for thinning); the wider spacing of Port-Orford cedar after thinning will achieve a secondary objective of creating barriers to the future spread of *Phytophthora lateralis*; and more heterogeneous stand conditions will be created. Uninfested areas would retain pockets of POC that would be physically separated from *Phytophthora lateralis* areas. Discontinuous POC populations have a lower likelihood of becoming infected by root grafting.

The POC component of infested sites would be killed. *Phytophthora lateralis* regeneration would be adversely impacted as the pathogen cannot reproduce in the absence of the host species. Those areas that receive burning treatments have additional potential for pathogen reduction. Research indicates that under laboratory conditions *Phytophthora lateralis* can be negatively affected by increasing temperatures.

POC exclusion along infested riparian reserves will physically separate healthy POC from the pathogen. While this treatment will exclude POC from along infested streams, up slope POC will remain and contribute to the aquatic ecosystem (*e.g.*, litter fall, CWD, shading).

Roadside Vegetation: Roadside treatments will reduce the potential for pathogen spread by eliminating the host and diminishing the potential for increase in *Phytophthora lateralis* populations. POC exclusion along roads reduces the potential for illegal activity such as theft which can spread the pathogen in infested areas.

Road Decommissioning / Blocking: Decommissioning and blocking roads protects existing uninfected POC, primarily large (>21" DBH) POC. Blocking roads reduces vehicle traffic and lessens the potential to export *Phytophthora lateralis* to uninfected sites.

b) Long Term

The effects over the long term include retention of large POC as a functioning part of both terrestrial and riparian ecosystems. This would enhance habitat for both the northern spotted owl and coho salmon, both federally listed species. Thinning treatments would accelerate the development of mature/late-successional habitat where it is currently lacking. The reduction of *Phytophthora lateralis* throughout the project area would lessen the danger to POC not only in this watershed but also in the adjacent Deer Creek watershed. The changes in plant species composition resulting from the proposed action would result in a different stand trajectory, towards a forest that more closely resembles the pre-logging, pre-fire exclusion forest of the past.

(3) Effects of Alternative POC-1 (harvest of POC boughs) *vs.* Alternative POC-2 (no harvest of boughs)

[1] Short term Effects

The risk of transporting Port-Orford cedar root disease increases as the amount of traffic (*e.g.*, foot) in infested areas rises. Harvesting of boughs would result in higher levels of traffic in the infested areas of Section 23. The potential for spread is consequently higher than if harvesting is precluded.

[2] Long Term Effects

The long term effects would depend on whether or not Port-Orford cedar root disease is moved from infested to uninfested areas. If disease is not transferred, there is no effect. If disease is transferred, effects can be extensive. There would, in effect, be an acceleration of the spread and consequent mortality. The effects of this are discussed above under the no action alternative.

6. Resource: Wildlife

a. Affected Environment

The Williams Watershed has a high degree of diversity in wildlife habitat and species. This diversity is due to: (1) the variation of vegetation types which naturally occurs within the watershed, based on aspect, slope, elevation and fire history, and (2) the geographical location of Williams watershed in the highly diverse Siskiyou Mountains. Within the watershed, there are over 50 special status species potentially present (Williams Watershed Analysis). The majority of these species require late-

successional forest habitat. The rarity of these species is partially a result of a decline in this habitat type in the watershed since prior to European settlement of the valley. Movement of species within the watershed and into the watershed is limited by fragmentation and loss or degradation of habitat, particularly in the lower elevations, where human activity has greatly altered the ecosystems. Special status species that are associated with late-successional forest conditions include: northern spotted owls*, great gray owls*, goshawks*, bald eagles, marbled murrelets, red tree voles*, Del Norte salamanders*, martins, fishers* and wolverines. (Those marked with asterisks are known to occur in the valley, and the others have potential to occur.) As a part of this project, surveys were conducted in planned sale units for great gray owls, Del Norte salamanders, red tree voles, mollusks and goshawks. Surveys for northern spotted owls will be conducted in the year of harvest activity.

Within the Scattered Apples project, some areas are noteworthy for their unique biological value to the watershed. Section 38-5-24 (001) is an unentered old-growth patch at relatively low elevation (portions are less than 2000'), 38-5-33 (001) is a large patch of mature trees, also at low elevation (mostly less than 2000'), and 39-5-14 (008) has an isolated patch of old-growth. Due to its location, unit 008 might act as an important stepping stone for a number of late-successional forest associates (*e.g.*, spotted owls, RTVs, neotropical songbirds).

The current vegetation condition in 39-5-25 serves as a dispersal corridor between Thompson Creek and Williams Creek drainages. This corridor may be used for the seasonal migrations and immigration of larger species such as deer, elk, bear, martin, fisher, and wolverine.

b. Effects of Actions Common to All Vegetation Treatment Alternatives

1) Timber Harvest

All action alternatives contain commercial harvest and pre-commercial thinning. All prescriptions include Project Design Features designed to minimize the impacts on wildlife. Commercial harvest will nonetheless have a negative impact on those wildlife species associated with high canopy closure, snags, and downed logs. Species associated with low canopy closure will benefit from these treatments. Impacts may result on three time scales, immediate (during operations), short-term (less than 20 years), and long-term (greater than 20 years).

a) Immediate Effects

There will be an immediate negative impact due to human presence and noise during logging operations, particularly during helicopter operations. Disturbance-sensitive species may be forced to flee units being logged and adjacent units. Nests, dens, and burrows would be destroyed in most commercial harvest units. Individuals would be killed, particularly those of low mobility such as small mammals, reptiles, amphibians, and invertebrates.

b) Short-Term Effects

In the short-term, reduced canopy cover will change micro-habitat conditions in these units, making them hotter and drier. While other species may be able to use these habitats, climatic changes will

cause some residents to move or die. Even higher-mobility species that can escape an area where vegetation treatment activities have changed the habitat are increasingly subject to exposure and predation as they travel through unknown and inhospitable areas, and may be unable to locate a new patch of suitable habitat. During the short-term, species composition and abundance may change quickly to favor species that tolerate or prefer disturbance, then gradually change back to those species that tolerate or prefer higher canopy cover, greater stand complexity, and presence of snags and downed logs.

c) Long-Term Effects

In the long-term, canopy cover may recover and mature conditions may develop. In some cases, timber harvest encourages the development of threatened habitat types (such as oak woodlands and pine-dominated stands) within the watershed, and will act to increase habitat diversity. In some cases, the development of uneven, multiple canopy layer conditions associated with mature stands from currently even-aged stands may occur more quickly as a result of the harvest prescriptions. In these instances, the long-term effects on late-successional forest associated wildlife may be positive. However, these effects will be gradual, and will not occur for at least 20 years in most cases, and some of these species could be extirpated from the project area before habitat conditions improve for them.

Precommercial thinning may accelerate the development of late-successional forest conditions in the long term by reducing competition for the trees that are retained. This could result in a greater amount of late-successional stands sooner. Canopy cover acts to conceal animals and also retains moisture in the ground. The short-term reduction in canopy cover will last for 20 years, at most.

The reduction of habitat for late-successional forest associates may reduce the abundance of these species in the Williams watershed. In addition to eliminating some high-quality habitat for these species, these treatments might negatively impact connectivity through the valley. These limitations in movement could lead to inbreeding depression as individuals are no longer able to disperse adequately. Low populations and a lack of patches to act as stepping stones and refugia could combine with a climatological stress (such as a drought or a severe winter) to cause local extinction of late-successional associates. Particularly at risk are low-mobility species (Wilcove, *et al.*, 1986).

Of particular concern is the harvest scheduled for mature stands. This habitat is in decline within the watershed, as are many of the species associated with it (see above). Large amounts of late-successional forests remain within the watershed, but these stands mostly occur on the west side, and are not well-distributed throughout the valley (See Table 3-1). Some of the proposed harvest will take place in essentially unmanaged stands.

2) Fire

All vegetation treatment alternatives contain treatments designed to reduce fire hazard within the watershed. These treatments are intended to (1) reduce fuel loads and therefore reduce the chance of hotter, catastrophic fire in the future; (2) return stands to a more natural composition, encouraging pine and oak woodland habitats which are in decline in the watershed; (3) enhance meadow and oak

savannah habitats for great gray owl foraging opportunities and for other species associated with this habitat.

Currently, 51% of BLM acres in the watershed are characterized as high wildfire hazard (Williams Watershed Analysis). Generally, these are areas which were more open in the past and which have been encroached upon by Douglas-fir due to past wildfire suppression. In natural conditions, wildfires would have occurred more frequently in the watershed, but would have had little impact on wildlife populations because they would have been low-intensity leaving numerous refugia areas available for displaced species. Under current conditions, wildfires pose a greater threat to wildlife because they have the potential to be hot, stand-replacement events. With a lack of refugia, wildfires could lead to population declines or localized extirpations. Reduction of this risk has a positive impact on wildlife.

All alternatives contain a wildlife prescribed burn project, involving an area that had been oak woodland, but is being encroached upon by Douglas-fir in the absence of fire. The wildlife burn would remove the conifer component from this area. There would be a short-term (less than two years) reduction in diversity and invertebrate populations within the area, but within one or two years the area will be of greater value than before the burn for great gray owl foraging, game foraging, and general diversity of wildlife and habitats. Following the short-term decline, populations of meadow and oak savannah species will likely recover to levels greater than current. Meadow and oak savannah habitats, which are uncommon in the federal land in the watershed, will likely have increased acreage and higher quality habitat. Great gray owls, acorn woodpeckers, Lewis' woodpeckers, flammulated owls, western bluebirds, grasshopper sparrows, big game animals, and reptiles may have higher quality habitats in the eastern portion of the watershed, and many of their populations should increase.

The ODFW reports reductions in deer populations in higher elevations in the Williams Watershed due to habitat loss. Prescribed burns would contribute to a rebound of these populations. (John Thiebes, personal communication).

3) Road work

Scattered Apples will reduce the overall road density within the watershed, by decommissioning 8.73 miles of inventoried BLM roads, plus an unknown amount of operator spurs in 39-5-15, while creating 0.1 miles of new road in 38-5-10. Gates would be placed on two roads, eliminating motorized access. (See Table 2-1.)

Road work will create an immediate disturbance by virtue of noise and human presence. Where new road is being created, wildlife habitat will be decreased in the road prism and a potential barrier to the movement of some species (particularly small species such as mollusks and salamanders) will be created. Because the new construction is only 0.1 miles, the barrier will not be great. Decommissioning of roads will encourage their re-vegetation. Decommissioned roads will likely be utilized to a greater extent by wildlife as travel corridors and will be easier for smaller organisms to cross once revegetated. Probably of greater importance, human presence and particularly motorized presence, will be reduced. Species that retreat from such a presence will have greater ranges for

movement and occupation. Decommissioning and gating should begin to show improvements in wildlife habitat as soon as road work ends. This would continue in the short and long terms.

4) Port-Orford Cedar / PL treatments

The Port-Orford cedar (POC) in 39-5-23 is infected with *Phytophthora lateralis*, an infection which is moving quickly through the area creating 100% mortality of this species. This would take place in the proposed 42 acres of PL treatment would reduce the mature stand characteristics by removing some mature trees and decreasing canopy cover. Most of this activity would occur in the Riparian Reserve.

In the short term the proposed PL treatments would reduce the habitat for late-successional forest species. A similar reduction would result under the no action alternative. If no action is taken, the pathogen will continue to kill large POC and their ecological functioning within the watershed would be lost. The proposed action should result in retaining a greater diversity in the long term by maintaining Port-Orford cedar in the watershed.

5) Trails

Three non-motorized use trails totaling approximately 20.5 miles are proposed. Recreational use of these trails will probably increase human presence in these areas, an increase expected to have a negligible effect on wildlife. The construction of the trail will have an immeasurable, but small immediate negative impact on wildlife as some species flee the human presence and noise. To a lesser extent, usage of the trail may cause some species to leave the vicinity in the short term and long term.

c. Effects on Individual Species Evaluated by Vegetative Treatment

1) *Northern Spotted Owls (and other Late-Successional Forest Associates)*

The Northern spotted owl is a listed threatened species which has relatively stringent habitat requirements. Their habitat is generally late-successional which is often described by the McKelvey rating system. In this system, Class 1 is habitat suitable for nesting, foraging, roosting, and dispersal of northern spotted owls, with canopy cover greater than 60%, a diverse and multi-layered canopy, with snags, large “wolf trees,” and a mixture of species. Class 2 is foraging, dispersal, and roosting habitat for northern spotted owls, with canopy cover greater than 60% and an understory open enough to permit flight. Northern spotted owls require McKelvey Class 1 conditions for nesting, and McKelvey Class 1 or 2 for foraging, roosting, and dispersal. As of 1996, there were 3,918 acres of McKelvey Class 1 forests on BLM land in the watershed, and 6,920 acres of McKelvey Class 2 (Williams Watershed Analysis).

Most of the BLM land with late-successional forest characteristics is found in the Late-Successional Reserves, but not all of it. Important patches of these forest types are found in the matrix lands throughout the valley. According to the Williams Watershed Analysis, nesting, roosting, and foraging habitat for northern spotted owls is heavily fragmented in the watershed, with little occurring

outside the LSR. "Patches of suitable roosting habitat on the eastern half of the watershed are naturally limited, . . . [and] should be maintained in their present conditions for dispersal into the Thompson Creek drainage" (WWA, p. 41).

Forest conditions suitable for northern spotted owls are also utilized by other late-successional associates. These sites have two additional functions. First, they serve as connecting blocks or stepping stones that a species may use to move through the valley. This function may be filled either on a short time-table, such as a stop for hours or days during the dispersal of young birds, or on a long time-table, such as the migration of red tree voles from one part of the valley to another, which could take decades. Second, because the Late-Successional Reserves are generally higher elevation than the patches of late-successional habitat existing in Adaptive Management Area or Riparian Reserve designations, these patches have somewhat different habitat characteristics than the late-successional uplands. These patches will tend to be more moist, temperate and productive than higher elevations. Those distinctions may provide micro-habitat characteristics to support species (such as songbirds, mollusks, and amphibians) that the uplands do not. Low-elevation late-successional forests are quite rare because these lands are more easily accessible and convertible to human uses. Any consequences for northern spotted owls from land management activities may be similar to the consequences for other species associated with late successional habitat, such as Del Norte salamanders, goshawks, marbled murrelets, bald eagles, martins, fishers, and wolverines.

The USFWS tracks northern spotted owl populations at a regional level. Consultation is required with this agency to ensure that local projects do not jeopardize the survival of the species. The USFWS considers any action that reduces or further reduces suitable owl habitat (McKelvey Class 1 or 2) below 40% of the area within a 1.3 mile radius (1,340 acres) of spotted owl nest sites to be causing "harm" to those owls. In those situations, the USFWS declares the project to be "taking" the owls in question, and must decide whether to authorize such a take. Under federal law and agency policy, takes of northern spotted owls do not invalidate a forest health project, as long as the long-term survival of the species in the region is not threatened.

There are nine known northern spotted owl sites that may be impacted by the Scattered Apples project. Of these sites, eight are currently below the 40% suitable habitat threshold. Any further reduction in their habitat would result in a take. Table 3-11 shows these nine sites and the impacts on northern spotted owl habitat under each alternative. In bold are conditions which will result in a take.

Table 3-11: Northern spotted owl sites in the vicinity of the Scattered Apples project

Owl Site	Suitable w/in 1.3 mi (acres)	Suitable habitat retained under each alternative (in acres)			
		Alt. V-1	Alt. V- 2	Alt. V- 3	Alt. V- 4
Bamboo Gulch	468 (14%)	**349** (10%)	**367** (11%)	**367** (11%)	**319** (10%)
China Basin	1,424 (43%)	1,409 (42%)	1,409 (42%)	1,409 (42%)	1,409 (42%)
China Creek	976 (29%)	**972** (29%)	**972** (29%)	**972** (29%)	**972** (29%)
Dale's Bluff	752 (22%)	549 (16%)	730 (22%)	730 (22%)	549 (16%)

Table 3-11: Northern spotted owl sites in the vicinity of the Scattered Apples project					
Owl Site	Suitable w/in 1.3 mi (acres)	Suitable habitat retained under each alternative (in acres)			
		Alt. V-1	Alt. V- 2	Alt. V- 3	Alt. V- 4
JoJack (Ashland)	251 (7%)	**152** (5%)	**170** (5%)	**170** (5%)	**122** (4%)
Moosejaw	1,807 (54%)	1,793 (54%)	1,793 (54%)	1,793 (54%)	1,793 (54%)
Panther Gulch	817 (24%)	**689** (21%)	**727** (22%)	817 (24%)	**689** (21%)
Pennington Ridge	1,307 (39%)	**1,056** (32%)	**1,246** (37%)	**1,246** (37%)	**1,056** (32%)
Rock Creek	893 (27%)	893 (27%)	893 (27%)	893 (27%)	893 (27%)

a. No Action Alternative

With no action, stands would continue to develop late-successional forest conditions. Northern spotted owls and other late-successional forest associates could increase in number. Patches of fragmented late-successional habitat could retain their functioning as habitat and as stepping stones for movement. Ranges of late-successional associates could increase and isolated populations might reconnect with larger populations, decreasing the risk of inbreeding depression (a reduction in genetic fitness caused by small breeding populations). The probability of stand-replacing fire would both continue to be high and continue to increase, putting at risk those species requiring these habitats.

b. Alternative V-1

This alternative reduces northern spotted owl habitat on 1,017 acres. These stands have some capability of supporting late-successional species at the present, and that capability will be reduced in the short term by harvest techniques. Alternative 1 includes 205 acres of harvest in mature or old growth stands in the east side of the Williams watershed (see Table 3-12). The Williams Watershed Analysis recommends that spotted owl habitat in the eastern part of the watershed should maintained in their present condition due to the rarity of this habitat type in the area. The loss of this habitat may prevent successful reproduction by the one pair of spotted owls known to nest in the east side of the watershed, or may lead to their demise. This alternative will involve five northern spotted owl takes.

Proposed Mitigation Measure #3: In the northwest corner of T38S-R5W Sec. 33, 17 acres exist within the ranges of two pairs of northern spotted owls. Retention of 60% canopy cover in this area will preclude the need for one take.

This alternative also involves precommercial and commercial harvest in Riparian Reserves. This activity will reduce canopy cover, increasing sight distance, increasing temperatures and decreasing moisture during the short-term. This will lower the effectiveness of these areas as corridors for the movement of wildlife such as invertebrates, amphibians, songbirds, red tree voles, goshawks, northern spotted owls and other species associated with high canopy cover. If Riparian Reserve stands have lesser quantities of snags and downed wood than comparable unentered stands, trees will be girdled and left standing or felled and left on site. In the long-term, this will accelerate the

development of these features that may be lacking throughout the watershed, and thus should provide greater habitat, prey base, and nesting opportunities for the species mentioned above. These features could begin to develop within five years.

c. Alternative V-2

This alternative reduces northern spotted owl habitat in 887 acres. The effects will be the same as for Alternative V-1 above, but will take place in fewer stands. In the east side of the watershed, there will be 145 acres of mature stands impacted (see Table 3-12). Thus, the impact on this habitat type will be less than that of Alternative 1. This alternative will cause five takes of northern spotted owls.

Proposed mitigation measure 3, above, could preclude one of the spotted owl takes.

There will be no commercial harvest in the Riparian Reserves, but there will be precommercial thinning. The objective of this thinning is to accelerate the development of late-successional forest conditions. Short-term effects such as increased sight distance, increased temperature, and decreased moisture in the Riparian Reserves will be less than Alternative 1. The long-term effects of accelerating development of late-successional conditions will remain. This may increase the populations and/or ranges of late-successional associates in the watershed as late-successional conditions develop in the long term.

d. Alternative V-3

This alternative reduces northern spotted owl habitat in 800 acres. Alternative 3 emphasizes maintaining current mature seral stage habitat. Commercial thinning will take place in fewer acres than in either Alternative 1 or 2. The areas deferred in this alternative are either contiguous with Late-Successional Reserves or contain patches of habitat that may be used by late-successional associates (see above). Patches contiguous with LSR land will effectively expand the undisturbed area available for wildlife habitat, as well as retaining connectivity between LSRs and between high-elevation LSR land and lower elevation valley floor lands. By retaining a greater amount of undisturbed mature seral stage habitat, this alternative may lead to greater numbers of late-successional associates and may avoid the extirpation of these species from the watershed. There will be 60 acres of mature stands on the east side of the valley impacted. (See Table 3-12) There will be four northern spotted owls takes.

Proposed mitigating measure #3, above, would preclude one of the takes of this alternative.

Alternative 3 will have a similar effect on Riparian Reserves as Alternative 2. This alternative appears to be the best for protection of northern spotted owls.

e. Alternative V-4

Alternative V-4 reduces northern spotted owl habitat in 1,017 acres. This alternative is likely to have the greatest detrimental impact on northern spotted owls because it alters the greatest amount of suitable owl habitat. In the east side of the watershed, 220 acres of mature stands will be reduced

through structural retention, and would not recover mature forest wildlife values for 80 years or more (See Table 3-12).

Alternative V-4 will have a similar impact on Riparian Reserves as Alternative V-1.

Table 3-12: Treatments proposed in mature stands in the eastern portion of Williams Watershed

East side mature stands	Number of acres and proposed treatment			
	Alt. V-1	Alter V-2	Alter V-3	Alter V-4
38-5-24 (001)	10, crown thin	0	0	10, structural retention
38-5-25 (001)	60, crown thin & group select	60, crown thin & group select	60, crown thin & group select	75, structural retention
38-5-35 (005)	40, crown thin & group select	40, crown thin & group select	0	40, structural retention
39-5-1 (007)	75, crown thin & group select	25, group select	0	75, structural retention
39-5-14 (008)	20, crown thin	20, crown thin	0	20, structural retention
TOTAL ACRES	205	145	60	220

2. *Red Tree Voles*

Red tree voles (RTV's), a Category 2 S&M species with mandatory survey and protection requirements (Instruction Memo #OR-97-009 and 98-105), are arboreal rodents that feed almost exclusively on the needles of Douglas-fir trees. They require mature forests with greater than 60% canopy cover and do not tolerate disturbance well. RTV's are poor dispersers. They are uncommon in the surveyed area, despite the presence of habitat that would support them. Protocol surveys located RTV's only at one location in the northwestern portion of the watershed (Pennington Mountain). (Note that no surveys were done in the Williams Late-Successional Reserve, or other suitable habitat in the valley, and they may well exist in these areas.) It is possible that these animals were once present in greater numbers, and were locally eradicated by past human activity in the watershed. If so, their poor dispersal abilities and the fragmentation of suitable habitat may explain their continued absence.

The responses of RTV's to this project will be similar to that of other late-successional species with two exceptions. First, RTV's are less capable of dispersing than many other late-successional associates. Therefore, patches which are greater than 1,000 feet from an existing population may be of limited use as a stepping stone. Second, RTV's are only known from one location within the watershed, despite the presence of suitable habitat throughout the watershed. Actions occurring around this area may slow any potential immigration of RTV's into the valley. However, as no RTV's apparently exist in most of the land covered under this project, impacts to actual populations are limited to one site in 38-5-3 and any individuals that might have avoided detection.

Two RTV nests were located, but these nests do not meet the applicable definition of a “population”. A population is defined as two or more active nests no more than 330' apart (Instructional Memo #OR-97-009 and 98-105). The two nests are further apart than 330'. Thus no protection is required.

a. No Action Alternative

With no action, stands would continue to develop late-successional forest conditions. Any extant red tree vole populations should increase, and immigration of red tree voles would become possible as late-successional stands linked together. The risk of inbreeding depression would gradually decrease as populations connected.

b. Alternative V-1

This alternative will alter mature stands within the valley as described above. Potential habitat around Pennington Mountain is of particular interest, as that is the only location where RTV’s are known to exist in the watershed. Under Alternative 1, 190 acres of 38-5-3 would be commercially thinned, including the two stands in which red tree vole nests were located. This activity would put those populations at increased risk of predation due to reductions in canopy cover. Individuals would expend more calories and spend more time exposed while traveling to food and water sources. Nests would dry out and become hotter due to increased sunlight. Research suggests that these nests would probably become unoccupied, either due to predation, senescence, or nest abandonment. Moisture levels within the canopy are probably a critical component of red tree vole habitat (Huff, *et al.*, 1992). If this is a remnant population of RTV’s that once inhabited more of the valley, or if this is an immigrating group following a local extirpation, the loss of these individuals would delay the recolonization of Williams watershed for an unknown time. As RTV’s are an important food source for great gray owls and spotted owls, population trends of these birds might positively correlate with RTV population trends.

c. Alternative V-2 and V-3

This alternative will commercially thin 100 acres in 38-5-3 and group selection cut 30 acres. Group selection is designed to mimic light gaps within mature forests that occur when a large tree falls. The timber extraction process associated with group selection may cause RTV’s to flee their nest areas due to noise and activity, and the areas harvested will become unsuitable RTV habitat due to the lack of canopy cover and food sources. However, the impacts will be less than the impacts of commercial thinning, because there will be continuous canopy cover greater than 60% in portions of the area.

As this alternative contains less activity in mature stands than does Alternative 1, the impact on maintenance and development of potential RTV habitat will be less. No commercial harvest in Riparian Reserves, as compared to Alternative V-1 and V-4) may result in greater suitability of these areas for RTV migration.

d. Alternative V-4

Under this alternative, units in 38-5-3 will be harvested with a structural retention prescription. This will result in habitat that is unsuitable for red tree voles, either as nesting and foraging habitat or a travel route between suitable habitats, for at least 40 years. All RTV's present would emigrate or die, and any migration of red tree voles will probably be impossible in structural retention units.

Proposed Mitigation Measure #4: The two currently known RTV nests in the area of this project could be protected by implementing a group selection harvest system in all action alternatives for ten acres surrounding each nest.

3. *Great Gray Owls*

Great Gray Owls are large birds that require open conditions (meadows, open forest stands, agricultural lands and recent clearcuts) to forage and nearby mature stands with greater than 60% canopy cover for nesting. The naturally varying vegetative conditions of the Williams watershed make it a good location for great gray owls (GGO's). The observations of great gray owls in the Williams watershed are the only confirmed ones in the Grants Pass Resource Area, indicating that this may be the western edge of the birds' range in southwestern Oregon. Recent research indicates that great gray owls may form loose colonial associations with one another (Duncan, 1997). Frequency of observations and locations of suspected and known nests suggest that such a colony may exist on the eastern portion of the Williams valley. (See pg.23)

a. No Action Alternative

With no action, stands will continue to develop late-successional characteristics. This will improve the quality and availability of nesting locations for great gray owls. Their populations may increase. However, as old clearcuts regenerate and as conifers invade meadows due to fire suppression, GGO foraging habitat will decline. As meadow habitat changes to forest, great gray owl populations may decline. With one parameter encouraging growth of the population and another encouraging its decline, it is difficult to predict the actual outcome for the owl population.

b. Alternative V-1

This alternative will involve some commercial thinning in stands near a potential GGO colony. Areas which are thinned will not be viable nesting locations for many years following harvest. These areas may become adequate foraging area following harvest until regrowth makes it difficult for the birds to fly to the ground.

All action alternatives also include a wildlife burn which will remove the conifer component from an oak woodland and meadow area that is a probable great gray owl foraging area. There will be a short-term (one year) reduction in prey base for the owls, but a rapid increase in prey abundance and quality of hunting area in subsequent years (Bendell, 1974). As above, it is difficult to predict the outcome for the owl population.

c. Alternative V-2

This alternative contains 120 fewer acres of commercial thinning than Alternative V-1, and 55 more acres of group selection in place of the commercial thinning. This will cause less disruption to the potential colony. Otherwise, the alternatives are similar. The owl population is more likely to increase than in Alternative V-1.

d. Alternative V-3

This alternative contains 390 fewer acres of commercial thinning than Alternative 1, and 30 acres more of group selection. It causes the least disruption of GGO nesting habitat of all action alternatives. The wildlife burn planned and the thinning that will occur in the area will increase foraging habitat. Pre-commercial thinning will accelerate the development of late-successional conditions that GGO's require for nesting.

e. Alternative V-4

In Alternative V-4 structural retention will be conducted in some areas and commercial thinning in others. The structural retention prescriptions in this alternative may provide a short-term increase in suitable foraging habitat for great gray owls. GGOs are known to forage in areas that have been clear-cut and might be able to forage in structural retention units as well (reference). The great gray owls in the east side of the valley could forage in 310 acres that would be cut with a structural retention prescription. The foraging opportunity would last for an estimated seven years and would not be available after regrowth obstructs access to the ground. Structural retention units would be inadequate for nesting habitat for at least 80 years. This alternative would probably result in a long-term decrease in great gray owl populations, because the increase in foraging habitat suitability would be transient and the decrease in nesting habitat suitability would be long-term.

4. *Song Birds*

There are 43 known or suspected neotropical bird species in the Williams watershed. Of those, 14 species are known to be in decline, 25 have insufficient data, while only four are stable or increasing (WWA, p. 18). A study was conducted in the Williams watershed on the effects of a previous timber sale on song bird populations (Janes, 1997). That study found that winter bird abundance declined by nearly 50% following commercial thinning operations. Eleven species that prefer forest interior conditions showed significant population declines, while six species that prefer or tolerate disturbance showed significant increases. The study hypothesized that declines were due to a decrease in foliage and bark foraging area and in cavities available for nesting. There was a modest increase in terrestrial insectivores, perhaps due to an increase in down wood which supports an insect prey base. Similar effects can be expected in the Scattered Apples project.

a. No Action Alternative

With no action, stands would continue to develop late-successional forest conditions, which would improve habitat for some songbirds. Those birds requiring mature, undisturbed forest conditions

would find their habitat gradually increasing. Fire danger would remain high. The high mobility of birds would mean that fire would be less of a threat to them than to other species, as they could avoid the fire and have a greater chance of finding alternate habitat. (However, that mobility could mean that a high percentage of available habitat is already occupied.) Overall, populations of songbirds requiring mature forest conditions would tend to increase throughout the watershed.

b. Alternative V-1

Alternative V-1 will involve the largest amount of commercial thinning and precommercial thinning. This will present the greatest reduction of all alternatives in the habitat of birds requiring undisturbed mature forest conditions. Increases in woody material on the ground, even if only transient slash and debris, will increase foraging opportunities for terrestrial foragers and woodpeckers, such as winter wrens and hairy woodpeckers, and their populations may increase. Other species may decline in range and abundance, with the largest declines expected in bark gleaners and foliage gleaners, such as chestnut-backed chickadees and red-breasted nuthatches (Janes, 1998). Overall, there would be a decline in the numbers of individuals and the number and range of species, particularly those requiring mature forest conditions.

c. Alternative V-2

This alternative contains a group selection prescription, which will create small openings in mature stands. Songbirds may be able to exploit the small canopy openings created by this alternative. Their mobility should enable them to forage in the openings, then retreat to higher cover areas for protection and nesting. This alternative should see increases in abundance and diversity, with minimal declines in those species that prefer disturbance.

d. Alternative V-3

This alternative contains the same group selection prescriptions as Alternative 2, and also defers treatment in some mature stands. By providing the refugia of mature stands and the foraging opportunities of group selection areas, this alternative will have the most beneficial impact on songbirds.

e. Alternative V-4

Alternative V-4 involves the greatest habitat change to the largest amount of land. The structural retention would create new habitat for some species, while reducing habitat availability for other species. Generally, however, those songbird species which favor recent disturbance have stable or increasing populations in this region, while those species which favor mature or forest interior conditions are more likely to be rare or in decline. Species population changes would be similar to that in Alternative V-1, with possibly greater increases in terrestrial foragers and greater decreases in foliage gleaners (Janes, 1998).

5. *Mollusks*

As of 1998, the BLM has begun surveys for S&M species of terrestrial mollusk species (snails and slugs). Different species have different habitat requirements. Within the Williams watershed, *Megomphix hemphilli* habitat includes large bigleaf maple trees near large logs, *Helminthoglypta hertleini* habitat includes talus, rocky areas, and large woody debris, even in drier sites, and *Prophysaon* species habitat includes conifer and hardwood logs. *Monadenia churchi* habitat includes woody debris, rock outcrops, and caves. Brushing and pre-commercial thinning will take place on around 1800 acres in each action alternative, and will have equivalent negative impacts on mollusks in each action alternative by decreasing surface moisture and increasing surface temperature. Commercial harvests will also have negative impacts on mollusk populations, differing among action alternatives.

a. No Action Alternative

With no action, stands would continue to develop late-successional forest conditions which benefit all species except *Helminthoglypta hertleini*. No action would take place to disturb talus or rocky areas, big-leaf maples, or downed logs. Habitat would gradually improve for all species. Fire hazard would remain high, and mollusks would be highly negatively impacted by high-temperature fires. Populations of all species would increase, unless a large-area fire occurred within the watershed, in which case populations could be locally extirpated.

b. Alternative V-1

Alternative V-1 contains commercial harvest in 907 acres. All special status mollusks except *Helminthoglypta hertleini* would experience a reduction in habitat quality. Commercial harvest will occur in Riparian Reserves, and will be particularly detrimental to mollusks. This alternative will require some trees in riparian zones to be felled and left on-site to increase the downed wood component. This action would increase the habitat potential for all special status mollusks and their populations may increase in these sites. Overall, populations would be likely to decline because the additions of beneficial microsites will be outweighed by the decreases in moisture and habitat complexity in the acres of commercial thinning.

c. Alternative V-2

Alternative 2 will involve commercial harvest of 742 acres. In those areas, habitat of all special status mollusks except *Helminthoglypta hertleini* will be greatly reduced. Riparian Reserves, where moisture-loving mollusks are more common, would not be commercially entered in this alternative, but the same trees would be felled in the riparian areas. Populations may increase in Riparian Reserves, and are likely to decrease in the acres commercially harvested. Overall, populations should decrease, but the decrease should be less than under Alternatives 1 and 4.

d. Alternative V-3

Alternative 3 will involve commercial harvest of 547 acres. In those areas, habitat of all special status mollusks except *Helminthoglypta hertleini* will be greatly reduced. Moist riparian reserves, where mollusks are more common, would not be commercially entered in this alternative. Populations might increase, as in Alternative V-2, in Riparian Reserves. Decreases should occur in the areas commercially harvested, but this alternative contains the smallest acreage of commercial harvest.

e. Alternative V-4

Alternative 4 involves commercial harvest of 909 acres, with 262 treated by structural retention. Structural retention would cause a greater reduction in the availability of moisture within affected units, and this would probably lead to the greatest reduction in mollusk presence. Habitat would also be reduced in Riparian Reserves. A greater acreage will be burned than in other alternatives, causing short-term reductions in mollusk populations. This alternative would probably cause the greatest reduction in habitat for all special status mollusks except *Helminthoglypta hertleini*. The reductions would also last longer than in other prescriptions. Thus, it is likely that Alternative 4 would have the greatest adverse impact on the S&M mollusk species.

6. *Bats*

Eleven species of bats are known to occur in the Williams watershed. Some species roost in snags or cavities. Others roost in caves or mines. Three species are known to select mature trees as roosts.

There are three known roost sites within the Scattered Apples area: two mines and one roost tree. These will receive a 250' buffer. However, it is difficult to locate roost trees and it is highly likely that treatment activities would inadvertently remove roost trees.

a. No Action Alternative

This alternative involves no disturbance at known or unknown bat roosts. Prey populations will not be altered. This alternative will have no known effect on bat populations.

b. Alternatives V-1, V-2 and V-3

All known bat roost sites will receive 250' buffers. It is likely that there are other bat roosts which are unknown, and they might receive no protection. The wildlife burn planned for all alternatives would increase insect prey base. Creation of snags in riparian areas through girdling will increase potential roost sites, and populations would likely increase.

c. Alternative V-4

Alternative 4 will probably result in the greatest decrease in currently unknown bat roost trees, but may also result in a greater short-term increase in insect prey base. Since some bats in this area seem

to prefer open areas for foraging, the reduction in canopy cover caused by structural retention probably will not prevent bat foraging. It is unknown how bat populations might respond under this alternative in the long-term.

7. Del Norte Salamanders

Habitat for these species is talus fields: rock areas with subsurface air pockets. Talus is not common in the project area. No salamanders have yet been located in the proposed treatment areas. Talus in 38-5-10 and 38-5-11 was surveyed to protocol for salamanders and none were found. Talus in 39-5-12 has not been surveyed. It will be surveyed prior to the sale, and buffered if Del Nortes are located. If no salamanders are found, then no alternative will have an effect on this species.

d. Cumulative Effects

This project could have effects when considered in conjunction with other activities in the vicinity. Scattered Apples is not the only timber harvest in the Williams area. Seven projects involving commercial timber extraction on government-administered land have been proposed or sold either in the Williams Watershed or within one mile of units of Scattered Apples within the past three years. These projects are summarized in Table 3-13. They total of 5,784 acres treated, commercially and non-commercially. In addition, private timber companies have ongoing harvesting activities in the area. Cumulative effects could include loss of habitat, temporary refugia, and habitat connectivity. Wildlife might be able to survive the habitat loss associated with timber sales by retreating for a short time to nearby refugia, or by increasing foraging pressure on remaining nearby habitat. Decrease in the availability of such habitat in proximity to the original habitat can increase negative impacts of this project. Removal of habitat on a landscape scale may preclude migration or movement through the entire watershed by some species, an impact that might not occur solely due to this project.

Table 3-13: Recent forest management activities in or near the Williams Watershed

Ferris Sleagle	192 acres	1702 MBF	BLM, Ashland	2000
Lower Thompson	1,464 acres	5858 MBF	BLM, Ashland	1997
Middle Thompson	2,675 acres	9958 MBF	BLM, Ashland	1997
North Murphy	779 acres	3344 MBF	BLM, Grants Pass	1997
Panther Gap	337 acres	1421 MBF	BLM, Grants Pass	1995
POC	308 acres	229 MBF	BLM, Grants Pass	pending
Sugar Bear	202 acres	1000 MBF	Josephine County	1999

Three of these sales, POC, Panther Gap, and Ferris Sleagle, have units that are adjacent to units of Scattered Apples. Recent harvest treatments in adjacent units have reduced the refugia available for species to retreat from this treatment. Effects described above frequently suggest a short-term decrease in diversity or population numbers followed by long-term increases, but that assumes some individuals remaining to recolonize disturbed areas. Area-wide extirpation of a species could occur, and available habitat would not result in occupation by that species for many years. The cumulative

effect of these adjoining sales is to reduce the refugia along the boundaries of the sales. Those boundaries are often ridges, and movement over ridges is naturally difficult due to required elevation gains, exposure to predation, and dry conditions. Where timber sale units exist on both sides of a ridge, potential movement may be greatly reduced. This is the case in sections 38-4-19, 38-5-25, and 39-5-1. Activities in these areas would possibly reduce or extirpate populations of late-successional associates and lower colonization potential.

Lack of mobility for species can result in genetic problems for a sub-population. Small populations that do not benefit from the import of genetic material via individuals that move into the area may experience inbreeding depression, which can result in extirpation of the population, or a reduction in genetic fitness that can last for hundreds of years. As connectivity is naturally limited within the Williams watershed, and further limited by human activity, genetic isolation of small populations is a possibility. Corridors of suitable habitat, especially connecting to other watersheds, allow gene flow. Retaining these corridors will help maintain populations of late-successional associates. A recent synthesis of corridor research indicates that corridors are indeed used by animals, and are a valuable conservation tool (Beier and Noss 1998).

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7. Resource: Botany

a. Affected Environment

(1) Survey and Manage (S&M) Vascular Species

Dry Douglas-fir plant communities predominate in the Scattered Apples project area. Moister communities, where the potential for S&M species is highest, are confined to northerly aspects and drainages.

Seven populations of *Cypripedium fasciculatum* are located within the project area in the following units: T37S-R5W-33 (001), T39S-R5W-1 (007), T39S-R5W-12 (002), T39S-R5W-12 (013) (3 populations), T39S-R5W-14 (007).

One population of *Cypripedium montanum* is located in T39S-R5W-12 in the vicinity of the Chinaman's Ditch. Another potential population is located in T38S-R5W-3, Unit 002. The population was heavily grazed making positive identification impossible. A site visit will take place during the flowering season to confirm its identification.

Cypripedium fasciculatum (CYFA) and *C. montanum* (CYMO) habitat occurs primarily on moist northerly aspects (anywhere from west to north to east slopes) in older forests with greater than 60% canopy closure. These orchid species are very long-lived, can take up to 15 years to emerge above ground and require specific mycorrhiza for germination and establishment. *C. fasciculatum* occupies a range from central Washington to northern California with some scattered populations in the Rocky Mountains. The species sparsely covers this range and is currently considered threatened or sensitive in most states. It is a Bureau Sensitive species under BLM policy and a Species of Concern under the Federal Endangered Species Act, besides being a S&M (Strategy 1 and 2) species. *C. montanum* can be found in this same range and also extends into Alaska. It is rare in southwestern Oregon, with fewer known populations than *C. fasciculatum.* It is also a S&M (Strategy 1 and 2) species. These species have been found growing together in the same location.

Two populations of *Allotropa virgata* occur in T39S-R5W-25 adjacent to the Chinaman's Ditch trail. *Allotropa virgata* occurs in upland closed canopy pole, mature and old growth seral stages in various plant series. The largest populations occur in old growth and most are highly isolated from each other. The species ranges from British Columbia to California. The species requires coarse woody debris and it may not emerge above ground every year. Appendix J-2 recommends that due to the species small, ephemeral seeds and its associated mycorrhizal relationships, large and relatively unfragmented habitat areas may be important to maintain viability and promote gene exchange. This species is a S&M (Strategy 1 and 2) species.

The dry, predominately Douglas-fir forest within this sale has potential habitat for *Allotropa virgata* throughout. Habitat for the *Cypripedium* species is more focused around northerly moist micro-habitats, especially in draws and drainages.

(2) Survey and Manage Non-vascular Plants

Fungi surveys completed to date have found that the highest diversity of species in the oldest, most intact stands. Examples of units with high diversity of fungi species include T38S- R5W-3, Units 002 and 005 and T39S-R5W-1, Unit 007.

One Protection Buffer species (as designated in the Northwest Forest Plan) was located in the T39S-R5W-1, Unit 007 close to the Chinaman's Ditch trail. No specific ecological information known about *Aleuria (Sowerbyella) rhenana*. It is a cup fungus known from only 10 sites in the region as of the publication of the Northwest Forest Plan (Castellano & O'Dell 1997). It occurs on accumulated duff and humus in low- to mid-elevation, older aged mixed conifer or conifer-hardwood forests. Management within habitat for this species could include maintaining dominance of specific overstory tree associates, minimizing loss and disruption of substrate from management or recreational activities and managing tree diseases (Castellano & O'Dell 1997).

(3) Special Status Plants

Two populations of *Camassonia graciliflora*, a Bureau Assessment species, were found in T38S-R5W-25, Unit 002. The species occurs rarely in open or shrubby slopes, grasslands and oak woodlands. It is on the Oregon Natural Heritage Programs List 2. List 2 contains taxa that are threatened with extirpation or presumed to be extirpated from the state of Oregon. The populations found were one of few for the state of Oregon. The species occurs more frequently in California, therefore Oregon is on the edge its range. These are the only populations of the species known in the Grants Pass Resource Area. Only two other populations have been found on the District in Jackson county.

Five large (over 1,000 plants) populations of *Clarkia heterandra*, a Bureau Assessment species, were found in T38S-R5W-35, Unit 002 in the vicinity of the Chinaman's Ditch trail. The species is found in shaded woodlands and is found more commonly to the south in California. It is also on the Oregon Natural Heritage Program List 2. These are also the only populations in the Resource Area. They are the only populations that have been found in Josephine County, although numerous populations have been found in Jackson county.

b. Environmental Effects

1) No Action Alternative

The effects of the No Action Alternative on special status species would be both positive and negative. Canopy closures and the limited moist microsites would be maintained as well as mycorrhizal connections. This would allow for the continued ecosystem structure and function and higher quality habitat required for the survival of these S&M plant species.

The No Action Alternative will result in a continuing increase of wildfire risk. This increases the risk of high intensity fire increases and the potential threat to *Cypripedium* populations, which do not to survive such fires (Appendix J-2).

2) Effects Common to All Action Alternatives

a) Recreation

Though no special status or S&M plants were found along the Scattered Apples Interpretive trail, it will pass through good potential *Cypripedium* habitat on northern and eastern slopes. Effects from the trail work or drainage work, plus subsequent recreational use could be the possible disruption of a population that may have been dormant during the original survey. Trail work or drainage work could remove a population. Trampling from hikers could compact soils or injure plants leading to reduced vigor or removal of a population.

Four S&M populations were found along or adjacent to the Chinaman's Ditch trail. The effects are the same as those mentioned above. All sites may require a trail re-route to avoid populations.

b) Riparian Treatments -

Most *Cypripedium* populations are associated with draws and streams due to their moist microsite habitat requirements. Although no populations were found adjacent to Class 4 or 5 streams, these streams do provide the best potential habitat in the project area. Establishing 25' buffers along Class 5 streams will be beneficial for any dormant plants immediately adjacent to the stream bed, but any commercial thinning outside these buffers may reduce any benefits gained by disrupting any adjacent habitat available to these species. Although canopy cover will be retained at 60% for these adjacent areas and in Class 4 riparian reserves, it is the ground disturbance that is the biggest issue. Short term effects would include disruption or extirpation of dormant populations and their associated mycorrhiza. Disruption in mycorrhizal connections could be detrimental over the long term to the productivity of such populations and could limit the ability for species to become established. Disruption of mycorrhizal fungi is detrimental to all plants associated with it, not just rare ones. Mycorrhizal fungi are a symbiotes of major importance to most higher plants acting to increase nutrient uptake efficiencies and productivity of forests (Harris 1984).

Class 4 and Class 5 streams are also primary habitat for S&M non-vascular species. As with the vascular S&M species, these species require moister microsites. The substrate for lichens and bryophytes can be the trees (especially hardwoods) and shrubs within riparian areas. At this time, effects on specific populations cannot be determined since surveys are not complete. It can be postulated, though, that habitat could be affected in the form of reduction of substrate for existing populations and for the establishment of new populations. Connectivity of habitat is very important for such species. Retaining standing trees and shrubs within these reserves could maintain suitable microclimate for S&M species. These trees and shrubs will also act as refugia and will provide the complex canopy structure required to protect species diversity and to act as dispersal centers for riparian-dependent species. Retaining standing trees will also maintain the special habitats associated with riparian areas such as seeps, wet areas and rocky outcrops where unique species could be located (NWFP ROD 1994). Therefore, the effect of removal of commercial sized trees and pre-commercial sized trees and shrubs in these riparian areas could reduce the ecological function of these reserves in relation to species diversity, species dispersal and mycorrhizal interactions.

c) Habitat Restoration/Enhancement and Fire/Fuel Treatments -

Enhancement of pine sites, oak woodlands and meadows will contribute to increased biodiversity for plant species in areas where tree encroachment or build up of thatch from grasses has occurred. Such projects reduce competition and encourage less common species to thrive. Fire and fuel treatments reduce hazardous fuels levels which could otherwise lead to catastrophic fire and destruction of plant populations and their habitats. This would be especially devastating for those areas with late-successional habitat.

Although fire can be beneficial for some plants and their habitats, care must be taken with such projects since S&M non-vascular species could be found on tree boles or shrubs, such as oaks. S&M lichens have been found in similar project areas leading to this possibility. Prescribed burning could kill such species growing on boles of trees. Mechanical thinning could also remove species and reduce substrate for dispersal of such species.

Proposed Mitigating Measure #5: Ensure that prescriptions provide for low flame lengths in areas with S&M non-vascular species on tree boles and areas adjacent to late successional habitat. Establish protection buffers around populations at risk from fire projects. Establish a monitoring program to track effects of fire on such species.

d) Alternative Forest Products -

Alternative Forest Product projects provide a practical means of eliminating hazard fuel build up in high density stands. This could be beneficial for plant habitat by reducing the threat of catastrophic fire. The effects would be the same as mentioned for fire and fuel projects or habitat enhancement projects. Therefore, mitigation in the form of protection buffers would be required to protect population centers and dispersal options.

e) Silvicultural Treatment Alternatives -

For all action alternatives, while short term, direct effects may be mitigated by the procedures outlined in the PDFs, long term, indirect effects could include a reduction in population size and productivity of individual *Cypripedium fasciculatum*, *C. montanum* and *Allotropa virgata* populations within protection buffers. There is no definitive information available on whether 100' radius buffers will protect these species populations in the long run. Disruption in mychorrhizal connections could be detrimental over an extended period of time to the productivity of the population.

Indirect effects will occur from harvesting in potential habitat. These effects are compounded because of the fragmented, sparse nature of potential habitat in the project area. Whether the silvicultural treatment is commercial thinning, group selection, structural retention or density management, the ground disturbance from such activities could be detrimental to any S&M populations that may be dormant presently or to any establishment of new populations from intact habitat. This is because the treatments could disrupt the mychorrhizal connections necessary for survival of these species. They could also disrupt potential dispersal corridors for vascular or non-vascular plants. Appendix J-2 discusses the importance of maintaining ecosystem structure and function for these species, besides maintaining immediate canopy closure. Depending on the treatments, the canopy will also be opened to varying points that could alter microsite from one of moisture and shade to more open, dry conditions. Appendix J-2 states that canopy closure should be maintained at greater than 60% for protection of microsite for the vascular S&M species.

The differences in level of effect on botanical resources is in direct proportion to the amount of habitat affected by silvicultural treatment. It is not just a result of the number of acres treated but also the size of intact habitat treated. Appendix J-2 states that size and quality of habitat are important factors for the survival of *Cypripedium* species. Therefore, when assessing treatment alternatives for effects on botanical resources, the most important aspects to review are the number of acres within the oldest stands that will have ground disturbance taking place and the type of disturbance (*i.e.,* dispersed treatments versus concentrated treatments). The variable of importance for the Scattered Apples project is the type of disturbance taking place for each alternative, because group selection and structural retention will reduce canopy closure over a larger area than commercial thinning.

Alternative V-1 treats the greatest amount of acreage with commercial thinning causing the most ground disturbance to remaining habitat for S&M plant species. This means a greater disruption of mychorrhizal connections which could affect long term productivity not only of S&M species, but all forest species. Opening of the canopy will not be as extreme in this alternative as V-2 or V-4, though. Combined with riparian treatments, this alternative is less beneficial than Alternative V-2 or V-3, but not as detrimental as Alternative V-4.

Although Alternative V-2 focuses more on maintaining late-successional habitat, the group selection it emphasizes will reduce canopy closure in a way that will fragment habitat more, eliminating moist microsites over a larger area and reducing connectivity of habitat. Therefore, Alternative V-2 is less beneficial for botanical resources than Alternative V-3.

Alternative V-3 requires fewer acres of commercial thinning and group selection than Alternative V-2 and allows for deferral of late-successional acres for the greatest retention of potential habitat. Habitat will be less fragmented, allowing for the greatest potential for dispersal of S&M species. The combination of treatment and deferral provides a balance in the amount of habitat disturbed versus the amount left intact.

Alternative V-4 would have the greatest negative effect on potential habitat due to the structural retention treatment occurring. The amount of canopy cover reduction would eliminate moist microsites on a larger scale, disturb mychorrhizal connections at the greatest level and would require a longer period of time for any late-successional habitat to be restored. Also, most units proposed for this treatment have high fungal diversity including T39S-R5W-1, Unit 007 where a Protection Buffer species has been located. This could lead to a higher risk that this species and other S&M species may not be able to maintain their viability in the vicinity of the project area. Combined with riparian treatments, this alternative is the worst case scenario for botanical resources within the project area.

3) Cumulative Effects

Most of the non-reserved BLM land with merchantable timber in the Williams Watershed is or will be included in landscape projects with timber activities. This can also be said for BLM land in the adjacent watershed to the east (Thompson Creek). In southwestern Oregon, no official habitat assessment has been done, but of the known *Cypripedium* population sites on BLM land, the majority are being affected by timber projects through canopy thinning, ground disturbance and habitat fragmentation. Of the known populations, the majority are being protected through buffers that have not been proven to ensure viability for a specific population. The LSRs may not be providing mitigation for these species, since the majority of populations and potential habitat exists in the lower elevation, mixed evergreen vegetation of the Matrix land allocation.

The reasonable foreseeable future actions that will take place in the Matrix and on county and private land will include continued timber harvest, understory treatments and clearing of forest land for development. More populations will continue to need buffering as more actions are planned on federal lands. Also, any populations on non-federal lands will most likely remain unprotected. The long term effect is a decrease in the ability of populations to maintain or to expand from these small

islands of undisturbed ground into surrounding altered habitat and a decrease in the chances for persistence of the species in southwestern Oregon.

Management recommendation sources and references cited:

Management recommendations have been based on Appendix J-2, Northwest Forest Plan, the Record of Decision (ROD) Northwest Forest Plan, the Medford District Resource Management Plan, the BLM Manual 6840, Medford District botanist advisement and professional knowledge.

Castellano, Michael A. and Thomas O'Dell. Management Recommendations for Survey and Manage Fungi. Government Publication. 1997.

Harris, Larry D. The Fragmented Forest, Island Biogeography Theory and the Preservation of Biotic Diversity. The University of Chicago Press, 1984,

Luoma, Daniel L., Joyce L. Eberhart, Michael P. Amaranthus. Biodiversity of Ectomycorrhizal Types from Southwest Oregon. Conservation and Management of Native Plants and Fungi. Native Plant Society of Oregon, Corvallis, Oregon. 1997.

Wells, T.C.E. The Biological Aspects of Rare Plant Conservation - Population Ecology of Terrestrial Orchids. Wiley and Sons Ltd. 1981.

8. Resource: Special Forest Products

a. Affected Environment

Historically and currently, there is a high demand for fuelwood and small timber sales in the project area due to the close proximity of Williams, Murphy, and Grants Pass. Port-Orford Cedar boughs are also in high demand. In the last five years there has also been an increase in the demand for poles and manzanita. Other Special Forest Products, such as burls, mushrooms, and medicinal plants are harvested in small quantities.

In the last five years, quantities of fuelwood available to the public from BLM lands have decreased dramatically. Fuelwood opportunities are traditionally connected to timber sales and are limited to slash left over from logging activities. With the decrease in the number of timber sales and the change from clearcutting to commercial thinning, very little slash from timber sales becomes available for public fuelwood areas. It has been about two years since fuelwood was available in the watershed from the Panther Gap Timber Sale. There are no areas currently available for fuelwood or pole cutting. Small amounts of timber have been sold from hazard trees and blow down. Fuelwood theft is fairly common.

b. Environmental Consequences

1. No Action Alternative

Opportunities for fuelwood, poles, and small timber sales in the project area would continue to be extremely limited or non-existent. Demand for products would continue to greatly exceed supply. Theft of special forest products (fuelwood, POC boughs, etc.) would continue to be a common occurrence.

2. Vegetation Treatment Alternatives V-1 through V-4

Units with the greatest potential for viable special forest product harvesting due to their accessibility, economic viability and high product quality are: 38-5-3-001 and part of units 003,004,006; 38-5-10-001; 38-5-11-002; 38-5-13-002; 38-5-24-part of units 006,007,008,009; and 39-5-15-001,005, and part of 002. The affects of harvesting in these units are the same for Alternatives V-1 through V-4.

Based on the assumption that treatments in these units will be accomplished through the Special Forest Products Program, approximately 180 acres would be available for small timber sales geared toward independent, local loggers and small milling operations. About 274 mbf would result from the thinnings. A variety of small sales would occur over a 6-10 year period.

Approximately 150 acres would be available for public and commercial fuelwood and pole sales over a ten-year period. The sales would be standing trees, thinned according to silvicultural prescriptions. Approximately 30 acres of manzanita would be available for commercial sales.

There would be a beneficial effect to the local public by creating opportunities for fuelwood and pole harvest. Individuals and community groups would benefit from having a supply of products available for utilization opportunities.

In addition, slash from the timber harvest proposals in alternatives V-1 through V-4 would be available for fuelwood.

3. Port-Orford Cedar Treatments / Exclusion treatments

Eradication of healthy Port-Orford Cedar decreases the amount of sustainable bough production in the treated areas.

Effects of Alternative POC-1: For one season, POC bough collection would occur on the approximately 60 acres of proposed POC treatment. This would yield several tons of products for harvesters.

Effects of Alternative POC-2: Several tons of products that have value as floral boughs would be slashed and burned and lost for their commodity value.

Proposed Mitigation Measure #6 : Schedule treatment activities such that bough harvest will occur prior to the commercial and pre-commercial thinning and girdling of green trees in section 23 and such that bough harvest occurs during dry periods in August through September 30. Flag around PL-infested areas so that those areas can be harvested last in order to reduce any possibilities of introducing PL to non-infested areas.

9. Resource: Recreation/Cultural

a. Affected Environment

Recreational use of the area is dispersed and includes: equestrian use, hunting, driving for pleasure, hiking and bicycling. Recreational use of the area largely follows existing roads, non-maintained trails and the mining ditches in the area. There is a lack of low elevation, easily accessible recreation opportunities for the local population or visitors to the area.

Cultural sites in the project area center around mining, which began when gold was discovered in 1858 in the foothills on the east side of Williams Creek. The Layton Ditch travels through the project area and dates to the 1860s and 1870s (Shampine, 1978).

b. Environmental consequences

1) No Action Alternative

There would be no change in the recreation opportunities in the project area. Current trends of dispersed recreation on public as well as private lands would continue. The cultural important ditches would eventually become overgrown and disappear from the landscape.

2) Recreation Proposed Action

Approximately 13 miles of recreational hiking trail would be created and one mile of interpretive trail. The value of the Layton Ditch would be maintained and highlighted as a recreational and historical feature.

Reference cited:

Shampine, Irene L. 1978. Williams Memories. Manuscript on file Josephine County Library, Grants Pass, Oregon.

Chapter 4
Agencies and Persons Consulted

A. Public Involvement

All public input was considered by the planning and ID teams in developing the timber sale proposal and in preparing this EA. Changes in the preliminary plan, as well as the proposed project design features, may be based, in part, on information received from the public. Agencies and persons consulted and public presentations regarding this project proposal include:

1) Mr. Charles A. Fustish, Fisheries Biologist, Oregon Department of Fish and Wildlife, Central Point, Oregon.
2) Dr. Donald Goheen; Southwest Oregon Forest Insect and Disease Technical Center, Central Point, Oregon
3) Dr. Everett Hansen; Department of Botany and Plant Pathology, Oregon State University, Corvallis, Oregon
4) Dr. Thomas M. Jimerson, Forest Ecologist, United States Forest Service, Eureka, California
5) Mr. Michael G. McWilliams, Forest Health Monitoring Specialist, Oregon Department of Forestry, Salem, Oregon
6) Mr. John Thiebes, Wildlife Biologist, Oregon Department of Fish and Wildlife, Central Point, Oregon

B. Summary of Public Comments / Involvement to Date

The Scattered Apples project is within the Applegate AMA. Reflecting this, the development of the Scattered Apples Forest Management Project involved a very extensive level of public involvement. Normal project scoping was complemented by a contracted (Social Ecology Associates) survey of the local residents to identify issues pertinent to the Scattered Apples Forest Management Project. Two public meetings at the Williams Community Grange Hall were held, six public field tours, and several meetings and field tours with representatives of the Williams Creek Watershed Council Working Group. As dialogue continued and developed between some representatives of the community and the BLM, a common understanding of certain terms, such as “restoration”, “commercial” harvest, “thinning” and “fuels hazard reduction” was achieved. This provided insight about how the BLM develops the best forest management treatments possible within the parameters of the Northwest Forest Plan, the Medford District Resource Management Plan and the knowledge and desires of the local community.

Throughout all discussions with the public, various common themes were expressed. Thinning stands of commercial and less than commercial size conifers was recognized as an opportunity to promote both a healthier forest and local economy while making forest products and contract opportunities available within the local community. High risk conditions of catastrophic wildfire were recognized throughout much of the forest, especially in low elevation and rural interface areas of the watershed. Some fuels management treatments were also seen as additional opportunities for providing useful forest products. Opportunities for “restoration” type treatments (understood as actions which improve conditions resulting from previous activities) within the project area were

identified: road improvement and road density reduction, erosive riparian area conditions, and areas of past commercial harvest where reforestation had been difficult.

Community efforts to work with the BLM in the development of this project resulted in a primarily conceptually framed alternative: the “Scattered Apples Restoration Alternative” (“SARA”). This addressed eight key issues and was intended to be used as a framework for the BLM to use in developing a more detailed Alternative. The concepts in the SARA were considered to the fullest extent possible in the development of the project design features. There is much commonality between these concepts and those that underlie the BLM’s mandates and existing plans.

The proposed actions in the Scattered Apples project proposal which speak to the eight key issues outlined in the SARA include the following:

1. Reduce road density to 1.5 miles per section.
   A. The Scattered Apples project proposes to decommission or close approximately 8.7 miles of road.
   B. Maintenance: Approximately 24 miles of roads are included for maintenance.

2. Reintroduce fire as a component of the forest ecosystem.
   A. Approximately 1,700 ac. underburns and wildlife burns are proposed.
   B. Approximately 13 miles of the “Chinaman’s Ditch” would be treated initially as a fuels break and would later be developed into a recreational trail.

3. Thin pole thickets only in already entered forest stands.
   A. Approximately 1,200 acres pre-commercial thinning (trees 4"-8" DBH) is proposed.
   B. Thinning (conifers - commercial and noncommercial) is a part of fuels treatment on “Chinaman’s Ditch” project.

4. Defer the watershed from any management activities which would potentially degrade water quality.
   A. No treatments are proposed along in class 1, 2, 3 streams except those directed at preventing the spread of PL.
   B. All actions within class 4 and 5 streams have special treatment buffers, no treatment buffers and deferrals.

5. Protect and restore wetlands.
   A. Wetlands of all four types listed in S.A.R.A., (wet meadow-marsh, fringing, seeps and springs, and forested) will be identified and buffered as a normal part of delineating riparian reserves.
   B. The removal of encroaching trees and shrubs is proposed to protect and restore meadows.

6. Preserve and enhance the renowned botanical diversity of the Klamath Siskiyou bioregion within the Williams watershed.

A. Botany surveys for threatened and endangered plants and nonvascular plants are conducted on each treatment area and appropriate buffer zones established.
B. Areas historically dominated by pine and oak plant series would be treated to promote regeneration by those species and retention of these vegetation types.
C. Stands of Port Orford Cedar infected with *Phytophthora lateralis* would be treated to mitigate spread. Uninfected stands would be protected.

7. Employ strategies to increase viability of wildlife in the watershed.
   A. Wildlife surveys for species such as bald eagles, northern spotted owls, great grey owls, goshawks, red tree voles, Del Norte and Siskiyou salamanders and mollusks are a normal part of project planning. Treatments are governed by the results of these surveys.
   B. Connectivity for species such as great grey owls is addressed for treatments in riparian areas of class 5 streams by increasing the buffered areas. Prescriptions for harvest in areas of great grey owl sightings has been adjusted to allow for retention of trees leaning at a 20% angle or greater, to facilitate juvenile survival.
   C. Core areas for nest sights of species such as northern spotted owl, bald eagle, great grey owl and goshawk are protected as provided for in the RMP-ROD.

8. Emphasize local stewardship to provide local benefit.
   A. The Scattered Apples project proposes to develop three recreational trail systems. Development would be contingent on community participation.
   B. It includes small sales and Special Forest Products sales opportunities to provide economic opportunities for local residents.
   C. Development of smaller scale service contracts with longer contract time frames to attract a wider range of potential contractors.

Opportunities to continue to improve communications between BLM and local residents were addressed in the closing statements of the SARA. Efforts toward the five areas listed are as follows:

1. Devote sufficient staff time to develop trust and collaboration with the Williams community.

As stated above, the efforts by BLM to involve local residents in the development of the Scattered Apples Forest Management Project are extensive, and are an example of how BLM sees its role in both land management and service as a public agency.

2. Extend collaborative efforts with the Williams Creek Watershed Council and the Williams Town Council.

Several meetings held with a representative of the Williams Creek Watershed Council Working Group have provided further understanding of the concerns of local residents, the Williams Creek Watershed Council and the mandates and constraints of the BLM as a land management agency governed by the Northwest Forest Plan.

3. Publish regular announcements and updates of BLM activities in the Williams Creek Watershed in the Williams News and the Grants Pass Daily Courier.

Although "regular" announcements and updates have not been published in the Williams News or the Grants Pass Daily Courier, various types of information in various formats have been provided: ad hoc information announcements have been provided to both medias, project scoping and EA comment periods were announced, the project status has been published quarterly in the *Medford Messenger*. Throughout the development of the Scattered Apples Project and other recent projects in the Williams watershed, the Watershed Council has provided an excellent vehicle for communication with the local community.

4. Participate in public meetings, hikes, etc. to facilitate better communication between the community and BLM.

In addition to the six public field tours mentioned, a workday on the Grayback Trail was held with the BLM and community members. The Scattered Apples project includes two other cooperative trail projects. Field tours were also held with the Williams Creek Watershed Council Working Group and local residents have offered comparative examples of reforestation stand maintenance treatments and species specific relative density commercial harvest and opportunities to discuss the various management activities of the BLM in the watershed.

5. Invite concerned members of the Williams community to attend Project Planning Team meetings and participate in further development of the Scattered Apples Restoration Alternative.

There was participation by a representative of the Williams Creek Watershed Council Working Group at several Project Planning Team meetings. They requested site specific information within areas of the project on maps and on field tours. A schedule of public field tours was made weekly by the Scattered Apples Project Planning Team in an effort to involve the public in further development of the project.

C. Availability of Document and Comment Procedures

A formal 30 day public review and comment period will be held. Copies of the EA document will be distributed to parties that have previously requested to receive one, will be placed in the Josephine county library (Grants Pass and Williams) and will be available to others upon request.

Written comments concerning the EA will be accepted for 30 calendar days after the announcement of the EA availability appears in the Grants Pass *Daily Courier* newspaper. Written comments should be sent to Bob Korfhage, Area Manager, Grants Pass Resource Area, BLM, 3040 Biddle Road, Medford, OR 97504.

Appendix A
Scattered Apples Forest Management Project Maps

Map 2: Roads and Trails

Map 3: Streams

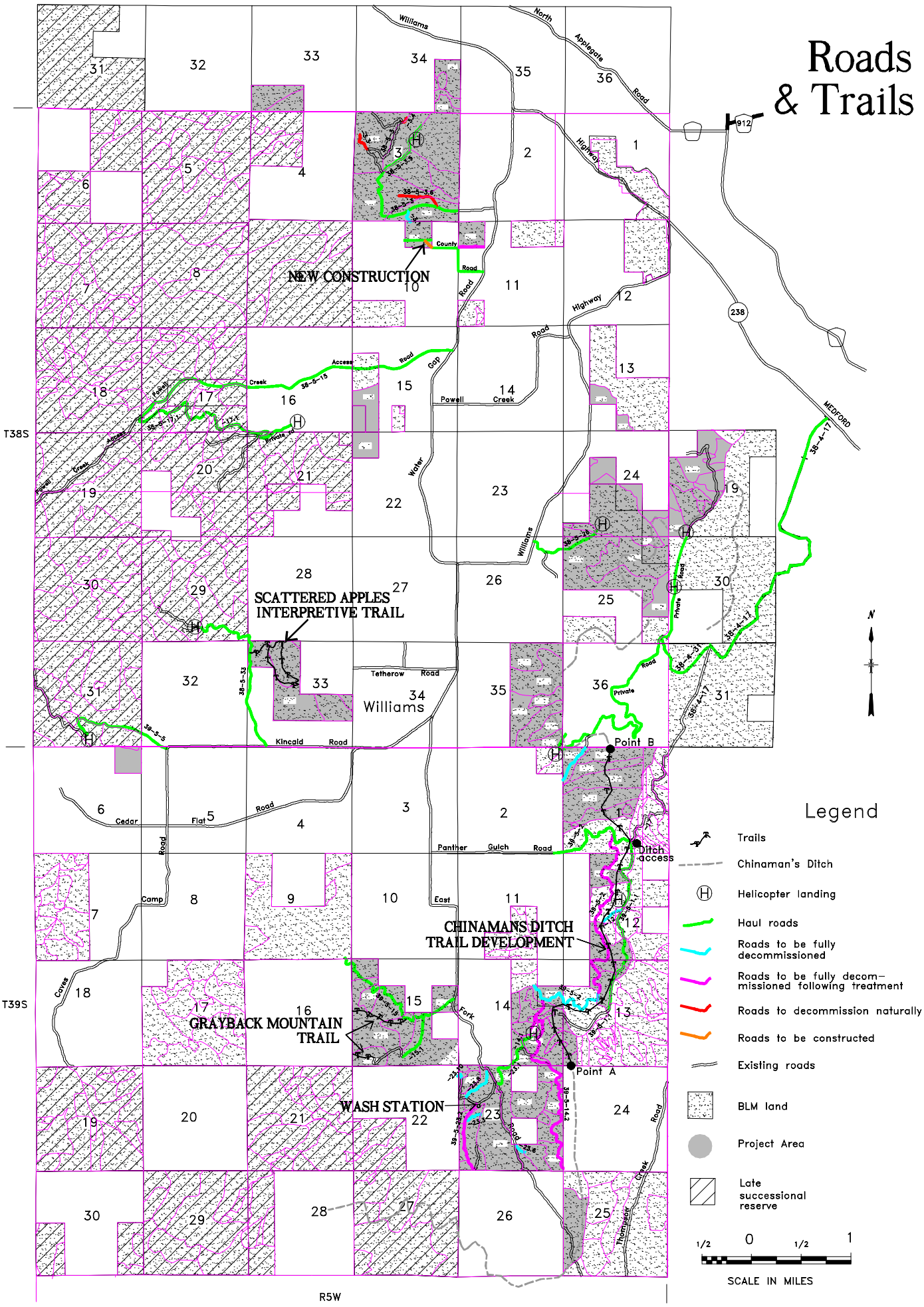
Map 4: Treatments Common to all Action Alternatives

Map 5: Vegetation Treatment Alternatives V-1 and V-4

Map 6: Vegetation Treatment Alternatives V-2 and V-3

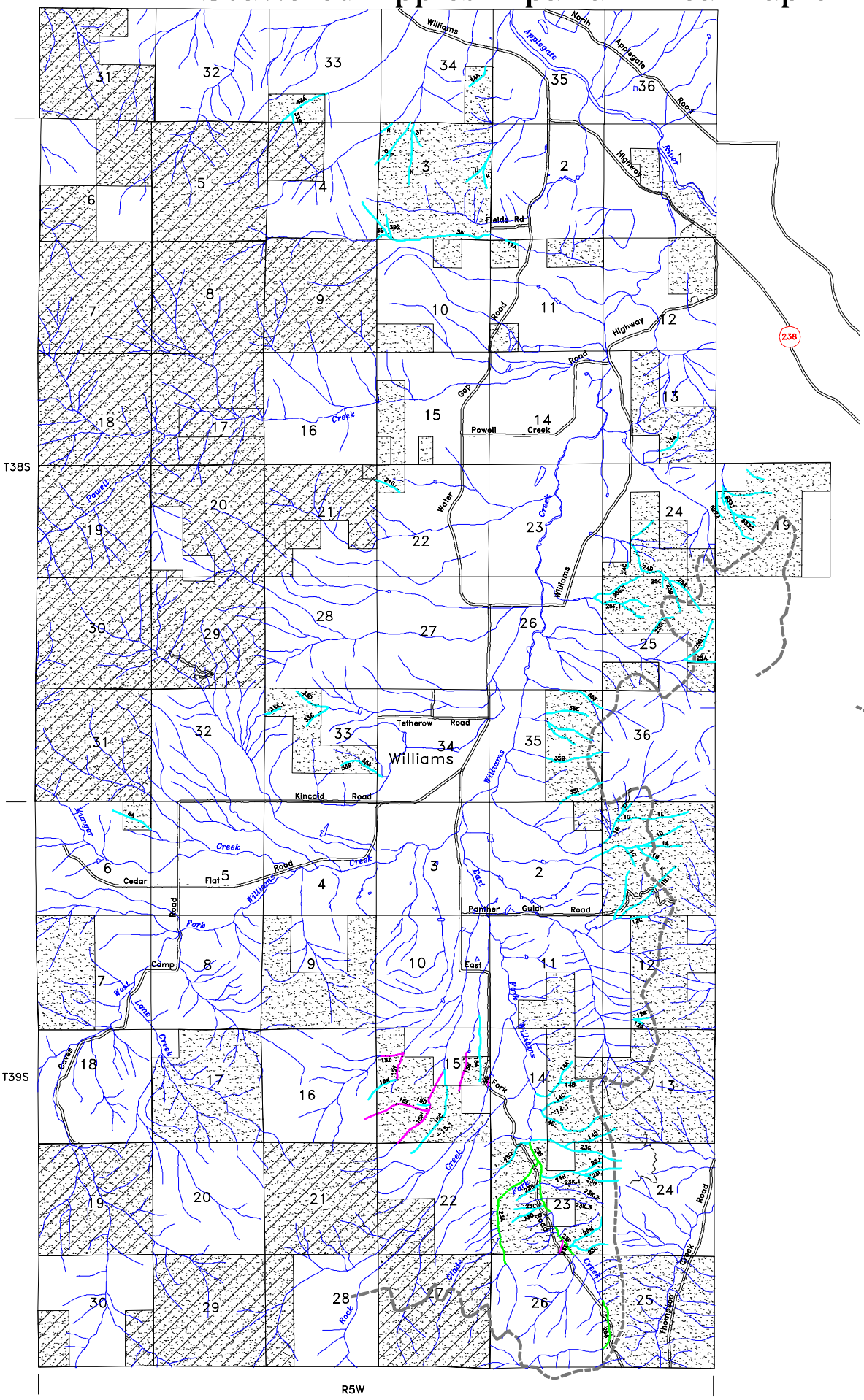
Map 7: Port-Orford Cedar Treatment (T39-R5-Sec23)

Scattered Apples Proposed Action Map 2



Scattered Apples Riparian Area Map 3

Streams



Legend

Reference w/Table E-1 Riparian Area Management

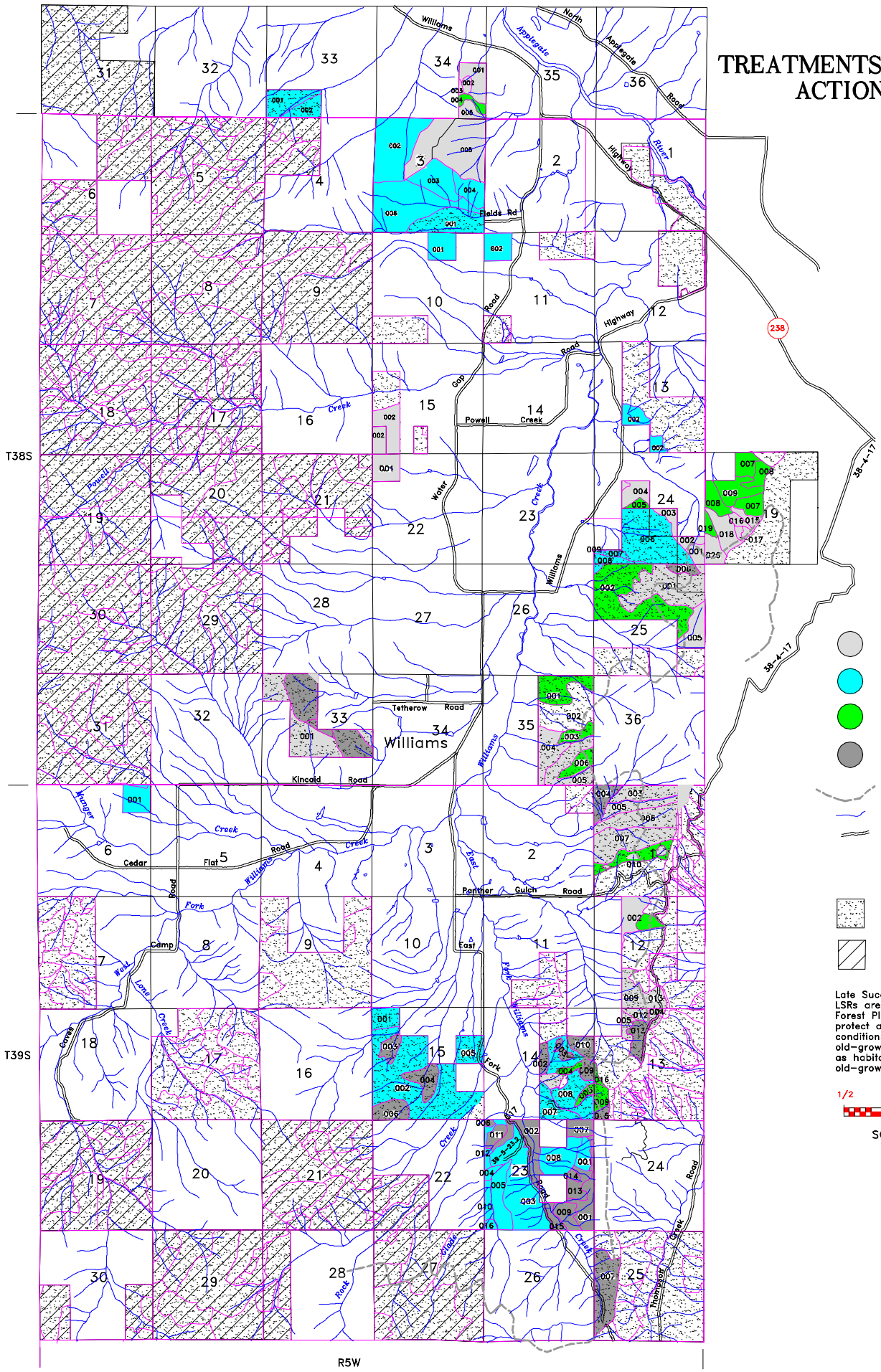
- Class 1 & 2 streams T39-5-23, 25 only
- Class 3 streams T39-5-15,23 ONLY
- Class 4 streams in all project areas except T38-5-10 & 15
- Chinaman's Ditch
- Streams out of project area
- Existing roads
- BLM land
- Late successional reserve

Late Successional Reserve (LSR) – LSRs are identified in the Northwest Forest Plan with an objective to protect and enhance conditions of late-successional and old-growth ecosystems, which serve as habitat for late-successional and old-growth forest related species.

1/2 0 1/2 1

SCALE IN MILES

Scattered Apples Proposed Action Map 4



TREATMENTS COMMON TO ALL ACTION ALTERNATIVES

Legend

- Commercial harvest
- Density management and Special Forest Products
- Fuels reduction or habitat enhancement
- No treatment
- Chinaman's Ditch
- Streams
- Existing roads
- BLM land
- Late successional reserve

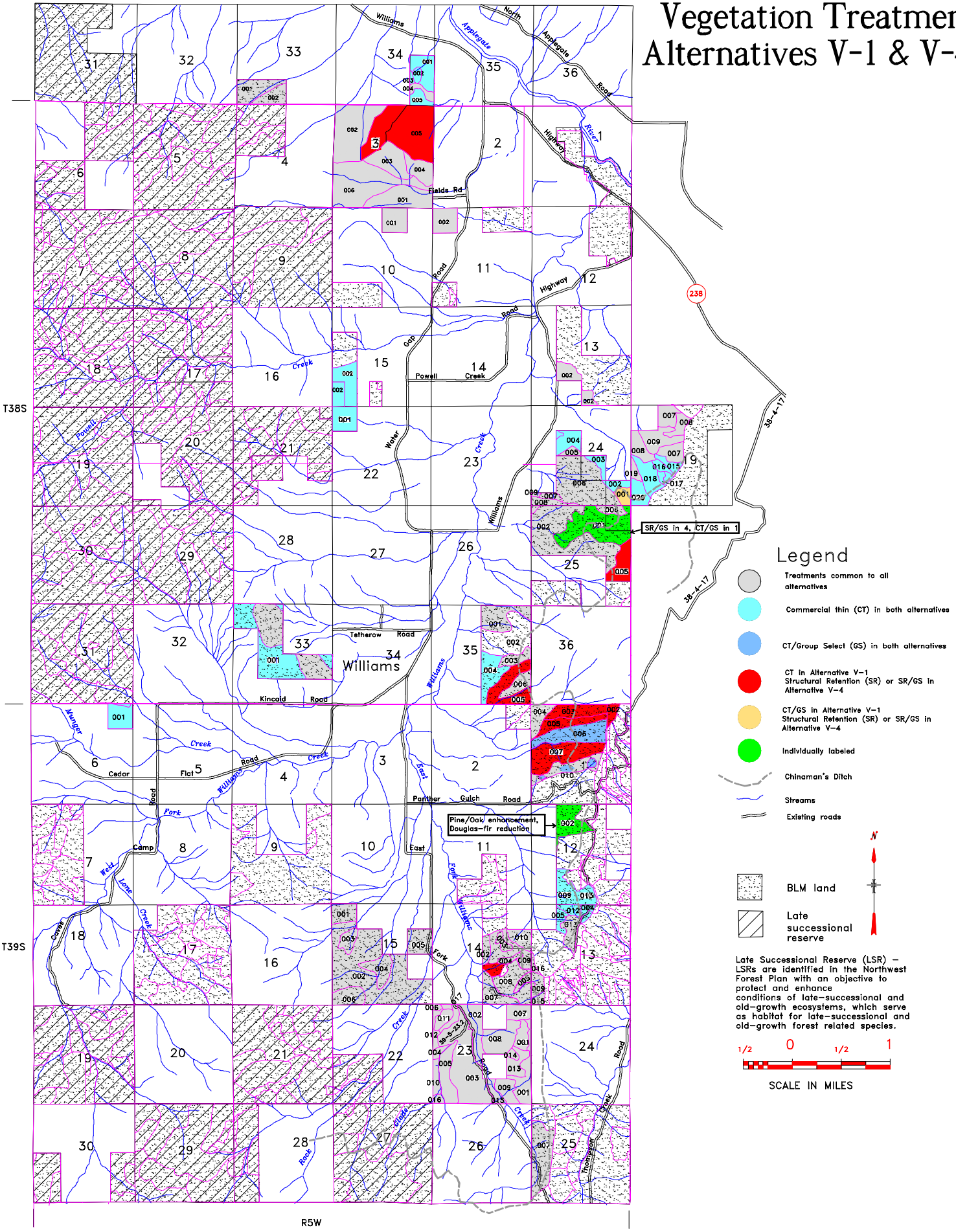
Late Successional Reserve (LSR) – LSRs are identified in the Northwest Forest Plan with an objective to protect and enhance conditions of late-successional and old-growth ecosystems, which serve as habitat for late-successional and old-growth forest related species.

1/2 0 1/2 1

SCALE IN MILES

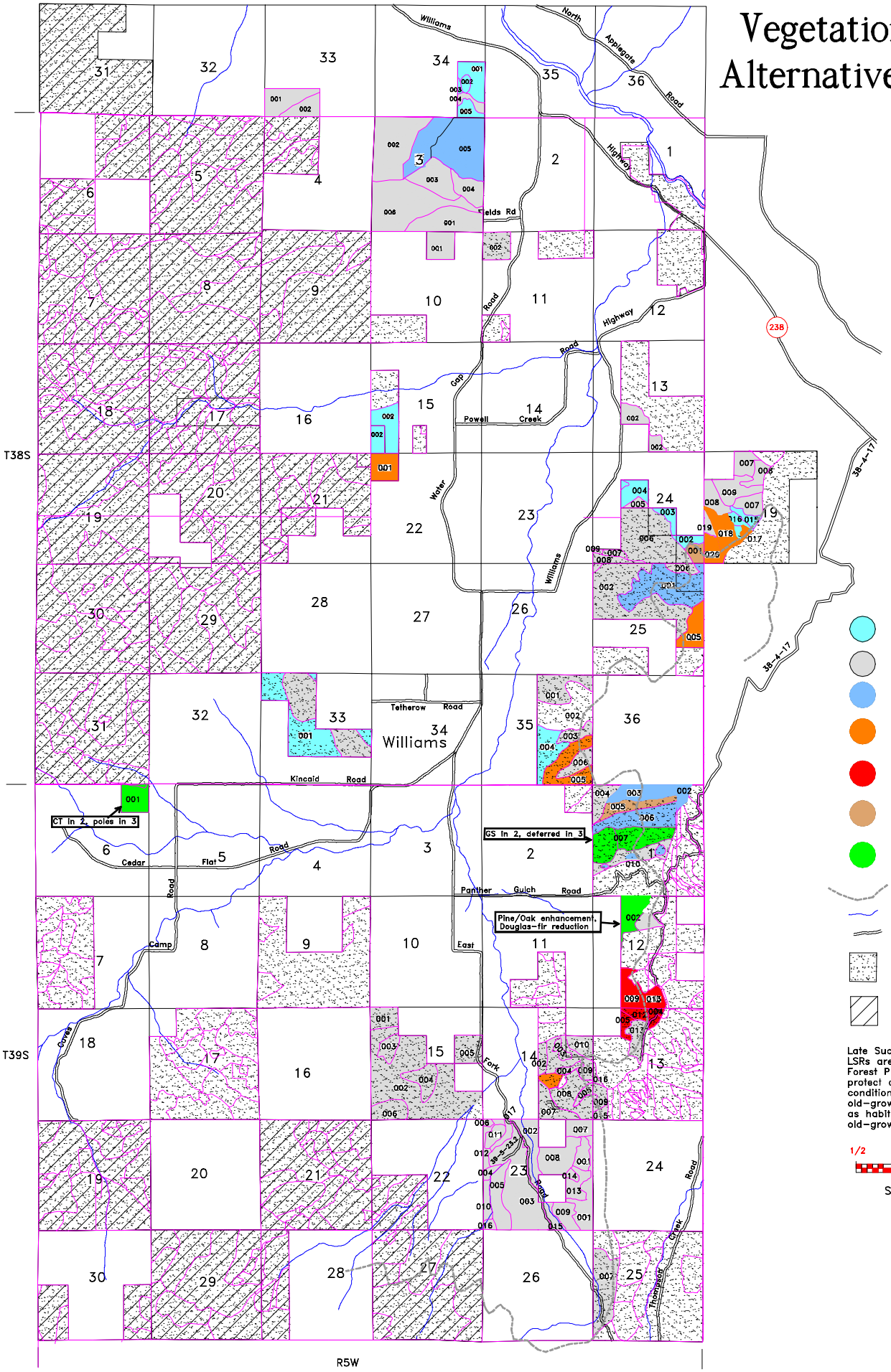
Scattered Apples Proposed Action Map 5

Vegetation Treatment Alternatives V-1 & V-4



Scattered Apples Proposed Action Map 6

Vegetation Treatment Alternatives V-2 & V-3



Legend

- Commercial Thin (CT) in both alternatives
- Treatments common to all alternatives
- CT/Group Select (GS) in both alternatives
- CT in Alternative V-2, deferred in Alternative V-3
- Crown thin in Alternative V-2, CT in Alternative V-3
- Deferred in Alternatives V-2 and V-3
- Individually labeled
- Chinaman's Ditch
- Streams
- Existing roads
- BLM land
- Late successional reserve

Late Successional Reserve (LSR) – LSRs are identified in the Northwest Forest Plan with an objective to protect and enhance conditions of late-successional and old-growth ecosystems, which serve as habitat for late-successional and old-growth forest related species.

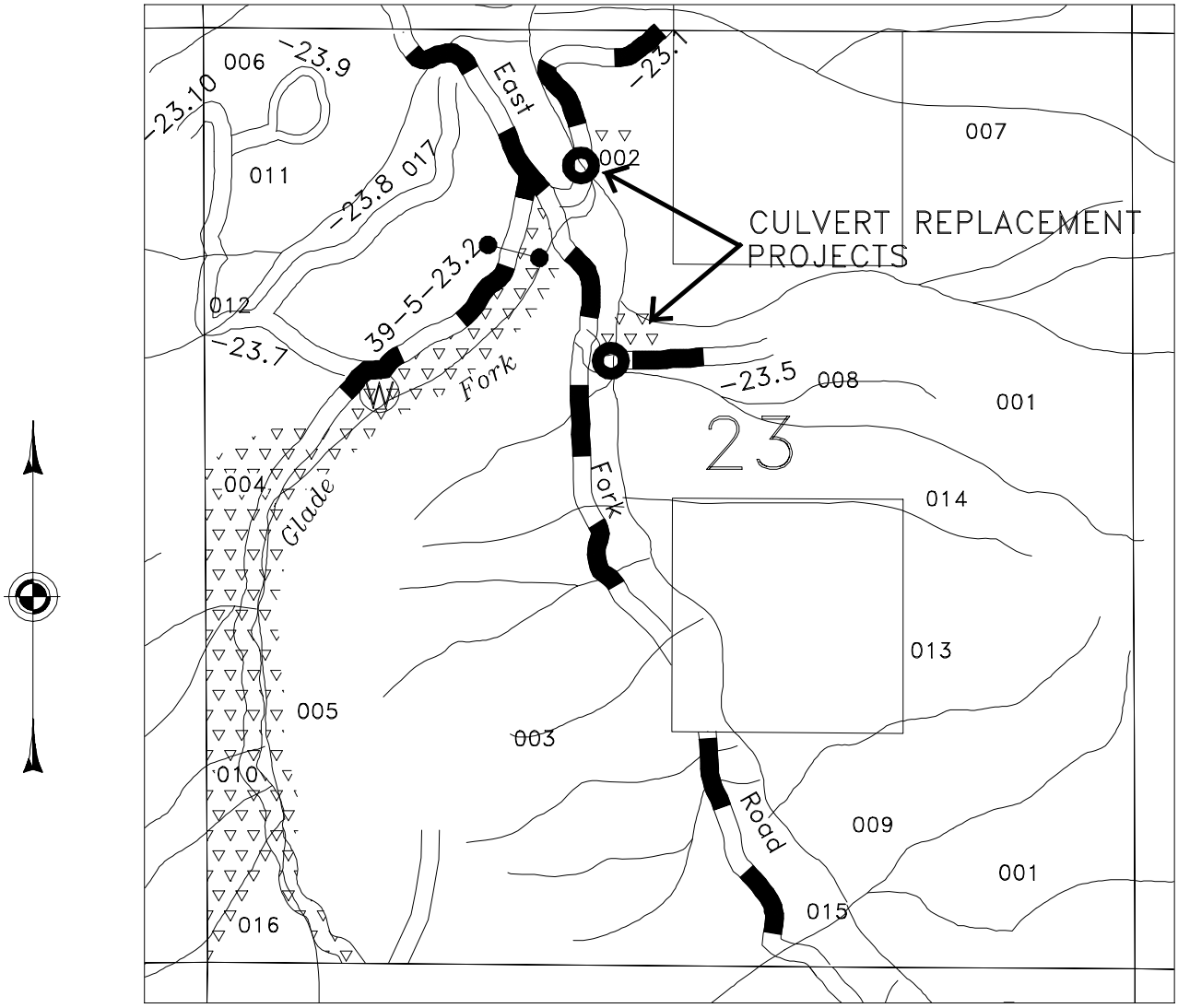
1/2 0 1/2 1

SCALE IN MILES

Map 7

Scattered Apples POC Treatments

T39S R5W Section 23



Legend

POC roadside treatment

Port-Orford Cedar exclusion

Gate

Washing station

Scale: 1" = 1000'

Appendix B
Scattered Apples Forest Management Project Proposed Monitoring

The following potential monitoring projects have been identified that could complement the Scattered Apples Forest Management Project.

A. Wildlife

1. Great Grey Owl Population Monitoring

a. Background

Great grey owls have been located in T38S-R4W-Sec 19, T38S-R5W-Sec 25 and T39S-R5W-Sec 1. This species is known to be loosely colonial (Duncan 1997). The exact population of the colony level is unknown but trends in population change might be captured by monitoring. Management around this colony will include several specifications to protect and enhance owl habitat. These actions include no treatment within units known to be nesting areas, wildlife burns that enhance foraging habitat, preservation of leaning trees that poorly flying juveniles use to escape predation, and irregular borders of treated areas to maximize foraging potential. Some of these protective measures are experimental, and much mystery remains about great grey owl behavior and habitat requirements. Surveys of the Great grey owl colony area should be conducted with the hypothesis that treatments within the area will improve habitat, and that populations should remain constant or increase post-treatment.

b. Monitoring Objectives

Determine baseline information on great grey owls.

- Does a great grey owl colony exist in the project area?
- What is the estimated current population?

Assess how effective silvicultural treatments are in maintaining and improving great grey owl habitat characteristics within areas known to be utilized by great grey owls.

- Assess the number of leaning trees pre-treatment vs. post treatment.
- Assess the number of perch trees adjacent to open meadow (horizontal branches 10'-15' high within 20' of open meadows)

c. Proposed monitoring plan

Monitor population trends: Is there a trend in numbers of owl sightings? Is there a change in numbers of nests or active nests in the colony area?

Protocol surveys already completed would act as baseline data.

Survey stands selected for treatment in T38S-R4W-Sec 19, T38S-R5W-Sec 24, 25, 35, and T39S-R5W-Sec 1, 12, 13 to evaluate great grey owl habitat. Surveys would be conducted pre-treatment and

post-treatment (two years after treatment, and would measure number of perch trees per acre in foraging areas, number of leaning trees per acre, canopy cover and vegetation in meadows.

Survey for great grey owls at 1 year, 5 years and ten years after treatments in colony area. Conduct surveys according to protocol both above and below 3,000 ft. elevation.

2. Songbird Monitoring

a. Background

"Changes in Winter Bird Populations on the Panther Gap Timber Sale: First Winter following Timber Harvest", Stewart Janes 1997, is an ongoing study of winter bird populations within the Williams Watershed. The study began in winter of 1994-95 and compared pre-treatment and post-treatment bird populations in the Panther Gap Timber Sale. Dr. Janes, an ornithologist at Southern Oregon University, has also collected pre-treatment data for the Scattered Apples project and hopes to collect post-treatment data from the same sites.

b. Objectives

Continue the flow of information to Dr. Stewart Janes in support of the study

c Description of proposed monitoring

Dr. Stewart Janes' study would be used for baseline data. The BLM would provide information on the predictability in the treatment plans.

3. Red Tree Vole Monitoring

a. Background

Despite some habitat which appears to be of high quality for red tree voles (RTV), they seem to be uncommon within the Williams watershed. Within the Scattered Apples project area, RTVs were located in T38S-R5W-Sec 3, on Pennington Mountain. Scientific curiosity and wildlife management concerns encourage an attempt to learn more about RTVs within the watershed. One hypothesis is that the RTV may have been locally extirpated, and the nests at Pennington represent either a remnant population or a recolonization from the Murphy Creek area. The Deer Creek watershed, located west of the Williams watershed, is known to have RTVs. This species seems to be a slow migrator and would likely be very slow recolonizer in the fragmented landscape of the Williams watershed. Monitoring of population trends and locations within the watershed would provide data on the needs of the species and its population trends. Monitoring could answer questions about whether RTVs are moving into the Williams watershed, and what level of habitat fragmentation constitutes a barrier to their migration.

b. Monitoring Objectives

*Determine the habitat needs and population trends of RTVs
*How effective are silvicultural treatments in maintaining and improving RTV habitat characteristics?

c. Description of proposed monitoring

*Within the Scattered Apples project area, monitoring would include surveys with the use of pole-mounted video cameras of the Pennington Mountain RTV nests for 4 years.
*Create detailed habitat descriptions for the RTV nests in the Scattered Apples project area. If these nests remain populated, these descriptions can be considered as acceptable habitat areas for RTVs within the watershed.
*Conduct surveys in the highest quality habitat, mature/late-successional, sites in the LSR on the west side of the Williams, and the eastern portions of Murphy Creek and Deer Creek watersheds.
*Monitor all nests found in the areas listed above for 4 years with pole-mounted video cameras.

A prioritization of the above potential wildlife monitoring would be a follows (high to low):

* Songbirds
* Survey stands selected for treatment to evaluate great grey owl habitat. Surveys would be conducted pre-treatment and post-treatment (two years after treatment, and would measure number of perch trees per acre in foraging areas, number of leaning trees per acre, canopy cover and vegetation in meadows.
* Survey for great grey owls at 1 year, 5 years and ten years after treatments in colony area. Conduct surveys according to protocol both above and below 3000 ft. elevation.
* Survey with the use of pole-mounted video cameras of the Pennington Mountain RTV nests for 4 years.
* Create detailed habitat descriptions for the RTV nests in the Scattered Apples project area.
* Conduct surveys for RTVs in the highest quality habitat, mature/late-successional, sites in the LSR on the west side of the Williams watershed, and the eastern portions of Murphy Creek and Deer Creek watersheds.
* Monitor all RTV nests found in the western portion of the Williams watershed for 4 years with pole-mounted video cameras.

B. Silviculture Treatment Effectiveness

1. The Effectiveness of Thinning Based on Crown Health

a. Background

Frequently used silvicultural thinning prescriptions focus on leaving stands of evenly spaced trees. In stands that have grown past the window for optimal growth response to thinning, this traditional

approach results in a stand of trees with small crown ratios (the percentage of the tree with live crown). Trees with small crown ratios will not respond (increase radial and height growth) to density management treatments as well as trees with larger crown ratios. A prescription based on thinning trees according to their live crown attributes (specific to tree species) was developed for testing with the Scattered Apples Forest Management project.

b. Monitoring Objectives

The objective of this monitoring is to measure how effective this prescription will be for maximizing the growth and yield potential for the stands treated. Data collected on tree growth will be compared to data on similar stand types where traditional silvicultural thinning treatments were recently implemented (Panther Gap Timber Sale).

c. Monitoring Plan

Growth plots would be established and measured prior to thinning harvest and at 5 year intervals after harvest. Control areas would be selected from unharvested areas within the unit. If the GGO monitoring is undertaken vegetation attributes pertinent to both would be collected on these plots.

C. Accomplishing Vegetation treatments with local workforce

Measurement of successfully addressing the local communities' desire to benefit in the treatments prescribed in the Scattered Apples project will be the number of acres treated each year by local residents. "Local Residents" will be defined as those living within the boundaries of the AMA.

D. Riparian Research Opportunity

A long-term riparian area research proposal is currently being developed by the Cooperative Forest Ecosystem Research (CFER) Program (Oregon State Office of the Bureau of Land Management, Oregon State University, US Geological Survey's Biological Resources Division, and Forest and Rangeland Ecosystem Science Center) in coordination with Medford District. Site selection criteria are being developed. There is a potential that Riparian Reserves proposed for treatment with this project may meet the site selection criteria. This opportunity is also being considered for other commercial thinning projects elsewhere within the Applegate AMA. Therefore, even if research sites are not selected specific to this project, this research will answer questions that can be applied across the AMA to future projects.

The preliminary objectives identified for this research project are to determine the effects of vegetative manipulation within intermittent Riparian Reserves on the following:

a) Reptiles, amphibians, invertebrates, soil arthropods, vegetation response (including non-vascular-bryophytes and lichens-and *Cypripedium fasciculatum*), insects, birds, small mammals, and mollusks.
b) Coarse woody debris (CWD) habitat for CWD-dependent organisms, and CWD recruitment in streams and riparian areas.

c) Soil Productivity (compaction, mycorrhiza, duff cover).
d) Micro-climate condtions.

Appendix C
Issues Considered but Eliminated From Detailed Analysis

The following issues arose during scoping and various public discussions but were judged to be outside the scope of the Scattered Apples project planning effort and were, therefore, not developed in the project:

1. Regional targets and local industry desires call for annual timber volumes per acre higher than have been achieved by recent sales under the guidelines of the Northwest Forest Plan.

This is a PSQ, RMP level issue and outside the scope of the Scattered Apples project.

2. Public individuals harvest mushrooms from BLM lands in the Williams watershed. Some individuals return to the same harvest areas annually and have requested that these favored sites be set aside from any entry that might disrupt their future harvests.

Despite repeated annual use of certain areas, individuals do not have claims which restrict BLM activity. These mushrooms grow widely across the region, and individuals may locate other patches. Some mushroom species populations may be decreased in areas of repeated harvest, and some species may rely upon fire disturbance. It is possible that proposed treatments will improve the mushroom abundance in the long-term by encouraging individuals to “fallow” some patches and by reintroducing fire in the form of slash-burning or wildlife burns. Additionally, some individuals have shown reluctance to divulge the exact locations of their harvest sites, making it impossible for the BLM to develop an inventory of these sites.

3. In T39S-R5W-Sec 35 and T39S-R5W-Sec 36, the East Fork of Williams Creek is degraded by previous road-building and a mine ditch. The stream has washed out down to bedrock, creating a channel six feet deeper than the floodplain. This area should be restored.

Originally, the restoration of this section of stream was advocated as a part of the Scattered Apples Forest Management Project because it was thought that the affected area was on BLM land. Surveys revealed that the impacted section of the creek is on private land, and is thus out of BLM jurisdiction. This project is referred to the Williams Watershed Council.

Appendix D
Harvest units considered but eliminated for structural retention treatment in Vegetation Treatment Alternative V-4

Several stands were initially considered for a structural retention harvest but were eliminated from this alternative because they did not meet the 120 -150 year stand age requirements, are not low vigor stands, or were currently below SGFMA target tree retention levels.

Table D-1: Stands / Units considered for inclusion in Upland Vegetation Treatment Alternative V-4 but deferred or not included.

Unit	Acres	Seral Stage / Veg Type	Reason eliminated from regeneration harvest method	Harvest Acres
T37-R5 Sec 33 - 001, 002	78	Mid DF	Less than 16-25 TPA of trees > 20" DBH	20
Sec 34 - 001, 002, 003, 005	71	Mat/Mid DF	Less than 120 years old Not Deteriorating	60
T38-R4 Sec 19 - 015, 016, 017, 018, 020	93	Mid DF	Less than 16-25 TPA of trees > 20" DBH	80
T38-R5 Sec 15 - 002	66	Mat DF/Pine	Less than 16-25 TPA of trees > 20" DBH	50
Sec 22 - 001	40	Mat DF/Pine	Less than 16-25 TPA of trees > 20" DBH	30
Sec 24 - 002, 003, 004	61	Mid DF	Less than 16-25 TPA of trees > 20" DBH	40
Sec 33 - 001	238	Mat/Old Growth DF	Pine Series Less than 16-25 TPA of trees > 20" DBH	60
Sec 35 - 004	54	Mid DF/Pine	Less than 16-25 TPA of trees > 20" DBH	40
T39-R5 Sec 1 - 006, 010	239	Mid/Mat DF/Pine/Oak	Less than 16-25 TPA of trees > 20" DBH	100
Sec 6 - 001	40	Mid/Mat DF	Less than 120 years old	40
Sec 12 - 002	40	Mid DF/Pine	Less than 120 years old Pine Series	25
Sec. 12 - 009, 013	49	Mid DF	Less than 120 years old Less than 16-25 TPA of trees > 20" DBH	15
Sec 13 - 004, 005, 012	39	Mid DF	Less than 120 years old Less than 16-25 TPA of trees > 20" DBH Pine Series	15

Appendix E
Silvicultural / Vegetation Treatment Tables

Included in this appendix are two tables that state the proposed silvicultural / vegetation treatments.
Table E-1: Proposed Riparian Reserve Treatments

2. Table E-2: Proposed Vegetation Treatments Common and Vegetation Treatment Alternatives V-1, V-2, V-3, V-4

1. Table E-1: Proposed Riparian Reserve Treatments

Table E-1 is a summary of existing conditions of class 1, 2, 3, and 4 streams in the project area as well as actions recommended by an interdisciplinary team of resource specialist. Specialists representing hydrology, engineering, fisheries, forestry, fuels, and wildlife disciplines were included in these recommendations.

Treatment recommendations are based on issues and recommendations found in the Williams Watershed analysis and the results of an intensive survey of the streams in the Scattered Apples project area. The Aquatic Conservation Strategy (ACS) was used as a guide for determining each riparian reserve treatment. The recommended actions are site specific for each stream reach of each stream. A majority of the recommendations (including no treatment) focus on stream bank stability, long term recruitment of cwd/snags, and connectivity function of the riparian reserves.

Identified Riparian Needs (c): Identified riparian needs were obtained from different disciplines, such as wildlife or fire management, and often focused exclusively on single resources.

Recommended Riparian Actions (d): The Scattered Apples project planning team analysis recommended riparian actions based on a synthesis of various resource needs. The recommended riparian actions are based on a larger picture. For example, hydrologists recommended thinning in some streams where wildlife biologists and botanists recommended retention of canopy cover. In these situations of competing recommendations, the planning team based the recommendations on the integration of all of the recommendations and the site specific conditions. These recommendations are the basis for the riparian reserve treatments in Scattered Apples project's proposed action and alternatives.

Table E-1: Proposed Riparian Reserve Treatments
(See Map 3)

Stream Reach (a)	Current Phys-Bio Functioning Condition (b)	**Identified Riparian Needs ©**						**Recommended Riparian Actions** (d)										
		Habitat Enhancement	Reduce Stem Density	CWD	POC	Restore Hydro Function	Erosion & Sed Control	No Treatment	Brush	PCT	CH	Recruit CWD	POC Treat.	Decomm Road	Improve Road	Wildlife Burn	Fuels Reduct. Burn	Plant Trees
T37-R5-Sec33																		
33A	PFC		X						X	X								
33B	PFC		X						X	X								
T37-R5-Sec34																		
34A	FARN		X	X					X	X	X	X						
T38-R4-Sec19																		
6272	FARD	X														X		
6331	FARN	X														X		
6332	PFC		X						X	X	X							
T38-R5-Sec3																		
3A	FARN		X	X					X	X	X							
3B2	PFC		X					X										
3N	FARN		X				X								X			
3O	FARU		X				X							X				
3P	FARD		X				X							X				
3R	FARN		X	X				X										
3S	FARN		X				X							X				
3T	FARN		X					X										
3U	FARN		X					X										
3V	FARN		X					X										

Table E-1: Proposed Riparian Reserve Treatments
(See Map 3)

Stream Reach (a)	Current Phys-Bio Functioning Condition (b)	**Identified Riparian Needs** ©						**Recommended Riparian Actions** (d)										
		Habitat Enhancement	Reduce Stem Density	CWD	POC	Restore Hydro Function	Erosion & Sed Control	No Treatment	Brush	PCT	CH	Recruit CWD	POC Treat.	Decomm Road	Improve Road	Wildlife Burn	Fuels Reduct. Burn	Plant Trees
T38-R5-Sec11																		
11A	FARD		X					X										
T38-R5-Sec 13																		
13A	PFC		X					X										
T38-R5-Sec22																		
21G	PFC		X	X				X										
T38-R5-Sec24																		
24C	FARN		X	X				X										
24D	FARU			X		X									X			
T38-R5-Sec25																		
25A	FARN		X	X				X							X**		X**	
25B	FARU		X					X							X**		X**	
25C	FARN	X	X	X		X												X
25A.1	NF		X					X										
25B.1	FARN		X			X		X										
25E.1	FARN	X					X											X
25F.1	PFC	X	X	X			X	X										
25G.1	PFC	X	X					X							X**		X**	
T38-R5-Sec33																		
33A	FARU	X		X			X	X										
33A.1	U		X						X	X	X						X	

Table E-1: Proposed Riparian Reserve Treatments
(See Map 3)

Stream Reach (a)	Current Phys-Bio Functioning Condition (b)	**Identified Riparian Needs** ©						**Recommended Riparian Actions** (d)										
		Habitat Enhancement	Reduce Stem Density	CWD	POC	Restore Hydro Function	Erosion & Sed Control	No Treatment	Brush	PCT	CH	Recruit CWD	POC Treat.	Decomm Road	Improve Road	Wildlife Burn	Fuels Reduct. Burn	Plant Trees
33B	PFC							X										
33D	PFC							X										
33E	PFC							X										
T38-R5-Sec35																		
35B	FARN	X	X					X							X**		X**	
35E	FARU	X	X					X										
35F	PFC	X						X										
35I	FARN	X	X			X		X							X**		X**	
T39-R5-Sec1																		
1A	PFC	X	X						X	X	X				X **		X**	
1B	PFC	X	X						X	X	X				X **		X**	
1C	PFC	X	X						X	X	X							
1D	PFC	X	X			X			X	X	X				X **		X**	
1E	PFC	X	X			X			X	X	X				X **		X**	
1F	FARN		X			X	X							X				
1G	PFC		X					X										
1H	PFC	X	X											X				
1B.1	FARD	X	X	X				X										
T39S-R5W-Sec 6																		
6A	FARN		X				X											X
T39-R5-Sec 12																		

Table E-1: Proposed Riparian Reserve Treatments
(See Map 3)

Stream Reach (a)	Current Phys-Bio Functioning Condition (b)	**Identified Riparian Needs** ©						**Recommended Riparian Actions** (d)										
		Habitat Enhancement	Reduce Stem Density	CWD	POC	Restore Hydro Function	Erosion & Sed Control	No Treatment	Brush	PCT	CH	Recruit CWD	POC Treat.	Decomm Road	Improve Road	Wildlife Burn	Fuels Reduct. Burn	Plant Trees
12A	FARU							X										
12B	FARN							X										
12C	FARN	X	X					X										
T39-R5-Sec14																		
14A	FARN		X						X	X								
14B	PFC		X													X		
14C	PFC		X					X										
14D	FARD		X	X														
14E	FARN	X	X	X				X										
T39-R5-Sec15																		
15A	PFC		X					X										
15B	PFC		X					X										
15C	PFC		X					X										
15D	PFC		X					X										
15E[3]	PFC		X					X										
15F[3]	PFC		X					X										
15G	PFC							X										
15X	FARN							X										
15Y[3]	FARU							X										
15Z[2]	PFC		X					X										
T39-R5-Sec23																		

Table E-1: Proposed Riparian Reserve Treatments
(See Map 3)

Stream Reach (a)	Current Phys-Bio Functioning Condition (b)	**Identified Riparian Needs** ©						**Recommended Riparian Actions** (d)										
		Habitat Enhancement	Reduce Stem Density	CWD	POC	Restore Hydro Function	Erosion & Sed Control	No Treatment	Brush	PCT	CH	Recruit CWD	POC Treat.	Decomm Road	Improve Road	Wildlife Burn	Fuels Reduct. Burn	Plant Trees
23A[1]	PFC		X	X	X								X	X				
23B	FARD		X					X										
23C	FARD		X					X										
23D	FARU		X					X										
23E[3]	FARN		X					X										
23F[1]	PFC			X	X								X	X				
23G	FARU							X										
23H	FARN		X	X				X										
23I	FARN		X	X					X	X								
23L	FARN	X	X	X				X										
23M	PFC							X										
23P[3]	PFC		X										X					
23Q	PFC							X										
23J	FARN		X						X	X								
23K1[1]	U		X					X										
23K2[1]	U							X										
23K3[1]	U							X										
T39-R5-Sec25																		
25A[1]	PFC							X										

Table E-1: Proposed Riparian Reserve Treatments
(See Map 3)

Stream Reach (a)	Current Phys-Bio Functioning Condition (b)	**Identified Riparian Needs ©**						**Recommended Riparian Actions** (d)										
		Habitat Enhancement	Reduce Stem Density	CWD	POC	Restore Hydro Function	Erosion & Sed Control	No Treatment	Brush	PCT	CH	Recruit CWD	POC Treat.	Decomm Road	Improve Road	Wildlife Burn	Fuels Reduct. Burn	Plant Trees

FOOTNOTES:
a) Stream Reach - #[1] - Class 1 and 2 streams; #[3] - Class 3 streams; # - Class 4

b) Current Functioning Condition - *FARU* - Functioning at Risk Upward, *FARD* -Functioning at Risk Downward, *FARN* - Functioning at Risk Not Apparent , *NF* - Non-Functional, *PFC* - Proper Functioning, *U* - Unknown
c) Identified Riparian Needs - *Habitat Enhancement* - improve foraging , improve or retain connectivity, add shade; *CWD* - Recruitment of Coarse Woody Debris into the streams, *POC* - Port Orford Cedar present, prevent the spread of PL; *Restore Hydrological Function* - Return flow to streambed and reduce flow velocity; *Erosion and Sediment Control* - reduce erosion and sediment flowing into the streams
d) Recommended Riparian Actions - *Brush* - Remove brush; *PCT* - Precommercial Thin; *CH* - Commercial Harvest; *POC Treatment* - Refer to pg. 19; *Decomm Road* - Refer to Table 1A
Improve Road - Refer to Table 1B; *Wildlife Burn* - improve foraging habitat and mobility for wildlife; ** - Improvements and fuels reduction on the Chinaman's Ditch Trail
Fuels Reduction - See Fire and Fuels Treatments pg. 9

2. Table E-2: Description of proposed Unit treatments - treatments common to all vegetation alternatives and treatments distinctive to Vegetation Treatment Alternatives V-1, V-2, V-3 and V-4

This table describes the proposed silvicultural / vegetation treatments within the Scattered Apples Forest Management Project. The first portion of the table describes proposed actions by Operational Inventory (OI) units that are included in all the action alternatives. The remainder of the table describes proposed vegetation treatment alternatives V-1, V-2, V-3 and V-4 by OI units.

Table E-2: Description of proposed Unit treatments - in all vegetation treatment alternatives and Vegetation Treatment Alternatives V-1, V-2, V-3, V-4

Vegetation Treatment Action Alternative	T-R-Sec	OI#	Land Alloc.	TPCC	Unit Acres	Seral Stage / Vegetation Series		Prescription	DBH Range		Logging Systems	Slash Treatment -- Understory Treatment	Unit Timber vol. (MBF / ac) **(Est)**	Treat ac. (Est)	Timber harvest			Reforestation Needed	Comments (see footnotes)
						Current	Post Harvest		Stand (in)	Harvest (in)					Harv ac. (Est)	Vol ac. (Est)	Vol Total MBF **(Est)**		
UNITS THAT ARE INCLUDED IN **ALL** VEGETATION TREATMENT ACTION ALTERNATIVES																			
ALL	37 5 33	001, 002	AMA	RMR RTR	78	Mid DF	Mid					PCT / L & S	10	20				Natural	DM / SFP

Table E-2: Description of proposed Unit treatments - in all vegetation treatment alternatives and Vegetation Treatment Alternatives V-1, V-2, V-3, V-4

Vegetation Treatment Action Alternative	T-R-Sec	OI#	Land Alloc.	TPCC	Unit Acres	Seral Stage / Vegetation Series		Prescription	DBH Range		Logging Systems	Slash Treatment -- Understory Treatment	Unit Timber vol. (MBF / ac) **(Est)**	Treat ac. (Est)	Timber harvest			Reforestation Needed	Comments (see footnotes)
						Current	Post Harvest		Stand (in)	Harvest (in)					Harv ac. (Est)	Vol ac. (Est)	Vol Total MBF (**Est**)		
ALL	37 5 34	004	AMA	RTR	9	Mid Pine		Hazard Reduction				SLB / HP		5					FR / HE
ALL	38 4 19	007, 008 009, 019	AMA	LSW RTR	152	Oak Woodland		Wildlife Burn				SLB / HP		152					FR / HE
ALL	38 4 19	007, 015 016, 017 018, 020	AMA					Hazard Reduction/ Hiking Trail				PCT / HP							Chinaman's Ditch
ALL	38 5 3	001	AMA	RTR	56	Mid DF/Pine	Mid	CT / Poles	2-12	4-12	GB	Understory Treatment and Harvest / L & S	2.5	50	20	0.2	4	Natural	DM / SFP
			Riparian Reserve			Mid DF/Pine	Mid	Poles	2-12	4-12	GB	Understory Treatment and Harvest / L & S	1	6	2	0.2	0.4	Natural	
ALL	38 5 3	002	AMA	RMR	185	Mid DF/Pine	Mid	CT	2-12	4-12	GB/C	Understory Treatment and Harvest/ L & S	8	80		0.5	40	Natural	DM / SFP Stewardship
ALL	38 5 3	003, 004 006	AMA	RTW	256	Mid DF/Pine	Mid	Poles	2-28	4-12	GB	PCT / L & S	10	246	20	0.2	4	Natural	DM / SFP
ALL	38 5 10	001	AMA	RTR	40	Mid DF/Pine	Mid	CT	4-32	4-20	GB	SLD / HP	5	40	10	2	40	Natural	DM / SFP Small Sale
ALL	38 5 11	002	AMA	RMR	40	Mid DF	Mid	CT	4-32	4-18	GB	PCT / SLD / SLB / HP	5	40	20	2	40	Natural	DM / SFP Small Sale
ALL	38 5 13	002	AMA	RTR	30	Mid DF/Pine	Mid	CT ITM	4-32	4-20	GB	Hardwoods 25x25 Conifers 14x14 Favor the Pines L & S	17	30	25	2	50	Natural	DM / SFP Small Sale Danger trees near residents

Table E-2: Description of proposed Unit treatments - in all vegetation treatment alternatives and Vegetation Treatment Alternatives V-1, V-2, V-3, V-4

Vegetation Treatment Action Alternative	T-R-Sec	OI#	Land Alloc.	TPCC	Unit Acres	Seral Stage / Vegetation Series		Prescription	DBH Range		Logging Systems	Slash Treatment -- Understory Treatment	Unit Timber vol. (MBF / ac) **(Est)**	Treat ac. (Est)	Timber harvest			Reforestation Needed	Comments (see footnotes)
						Current	Post Harvest		Stand (in)	Harvest (in)					Harv ac. (Est)	Vol ac. (Est)	Vol Total MBF (**Est**)		
ALL	38 5 24	001, 002	AMA					Hazard Reduction/ Hiking Trail				PCT / HP							Chinaman's Ditch
ALL	38 5 24	005	AMA	RTR	10	Mid Pine		Hazard Reduction				HP and Understory Treatment		10					FR / HE
ALL	38 5 24	006, 007 008, 009	AMA	RMR RTR RTW	172	Mid Pine	Mid	Oak Thinning Firewood / Poles	4-24	4-16	GB / C	PCT / SLB / HP		172	20	0.2	10	Riparian Plant-Maples Dogwoods Oregon Ash	DM / SFP Harvestable Manzanita. Noxious Weeds
ALL	38 5 25	001, 002 005, 006	AMA					Hazard Reduction/ Hiking Trail				PCT / HP							Chinaman's Ditch
ALL	38 5 25	002	AMA	RTW	152	Oak Woodland		Firewood / Poles	6-20	6-12	GB			8		0.2	4	Natural	DM / SFP in NW corner above road
						Oak Woodland		Wildlife Burn						144					FR / HE
ALL	38 5 25	006	AMA	RTR	14	Oak Woodland		Deferred											Mine Tailings
ALL	38 5 33	001	AMA	RMR	238	Mid/Mat DF/Pine	Mid/Mat	Firewood / Poles	4-24	4-16	GB	SLB / HP	15	25		1	25	Natural	DM / SFP - NW corner, no access
ALL	38 5 35	001, 003 006	AMA	RMR LSW	111	DF/Pine Oak Woodland		Enhance Pine / Oak / Meadow Habitat				L & S		57					FR / HE GGO foraging habitat enhancement
ALL	38 5 35	003, 004 005, 006	AMA					Hazard Reduction/ Hiking Trail				PCT / HP							Chinaman's Ditch

Table E-2: Description of proposed Unit treatments - in all vegetation treatment alternatives and Vegetation Treatment Alternatives V-1, V-2, V-3, V-4

Vegetation Treatment Action Alternative	T-R-Sec	OI#	Land Alloc.	TPCC	Unit Acres	Seral Stage / Vegetation Series		Prescription	DBH Range		Logging Systems	Slash Treatment -- Understory Treatment	Unit Timber vol. (MBF / ac) **(Est)**	Treat ac. (Est)	Timber harvest			Reforestation Needed	Comments (see footnotes)
						Current	Post Harvest		Stand (in)	Harvest (in)					Harv ac. (Est)	Vol ac. (Est)	Vol Total MBF (**Est**)		
ALL	39 5 1	003, 004 005, 006 007, 010	AMA					Hazard Reduction/ Hiking Trail				PCT / HP							Chinaman's Ditch
ALL	39 5 1	004	AMA	RTR	35	Mid Pine/Oak		No Treatment											
ALL	39 5 1	010	AMA	RTR	172	Oak Woodland		Hazard Reduction				SLB / HP		60					FR / HE
ALL	39 5 12	001, 002	AMA					Hazard Reduction/ Hiking Trail				PCT / HP							Chinaman's Ditch
ALL	39 5 12	002	AMA	RTR	40	Mid Pine/Oak	Mid	Wildlife Burn DF Removal				UB / HP		15					FR / HE
ALL	39 5 12	009, 013	AMA					Hazard Reduction/ Hiking Trail				PCT / HP							Chinaman's Ditch
ALL	39 5 13	013	AMA	RTR	21	Mid DF		No Treatment				PCT / HP							Unit in Panther Gap Timber Sale
ALL	39 5 13	004, 009 012, 013 015, 018	AMA					Hazard Reduction/ Hiking Trail				PCT / HP							Chinaman's Ditch
ALL	39 5 13	009, 016 018	AMA	RTW RTR	28	Mid DF/Pine Oak		Pine/Oak-Meadow Habitat Enhancement				HP		28					FR / HE
ALL	39 5 14	003, 010	AMA	RTW RMR	28	Meadow		No Treatment											003 - Meadow 010 - GGO
ALL	39 5 14	004, 005	AMA	RTW	19	Oak Woodland		Enhance Pine/Oak Meadow Habitat				HP		19					FR / HE

Table E-2: Description of proposed Unit treatments - in all vegetation treatment alternatives and Vegetation Treatment Alternatives V-1, V-2, V-3, V-4

Vegetation Treatment Action Alternative	T-R-Sec	OI#	Land Alloc.	TPCC	Unit Acres	Seral Stage / Vegetation Series		Prescription	DBH Range		Logging Systems	Slash Treatment -- Understory Treatment	Unit Timber vol. (MBF / ac) **(Est)**	Treat ac. (Est)	Timber harvest			Reforestation Needed	Comments (see footnotes)
						Current	Post Harvest		Stand (in)	Harvest (in)					Harv ac. (Est)	Vol ac. (Est)	Vol Total MBF (**Est**)		
ALL	39 5 14	007, 008	AMA	RTR RMR	163	Mid/Mat DF	Mid/Mat	Firewood / Poles	4-48	4-16	GB / C	SLB / HP	1-15	143	50	0.5	25	Natural	DM / SFP
ALL	39 5 14	005, 008 009, 010	AMA					Hazard Reduction/ Hiking Trail				PCT / HP							Chinaman's Ditch
ALL	39 5 14	009	AMA	RTR	9	Mid DF		No Treatment											
ALL	39 5 15	001, 002 005	AMA	RMR RTR	339	Mid/Mat DF/ Tanoak	Mid/Mat	Firewood / Poles	4-60	4-24	GB / C	SLB / HP / PCT	5-20	338	70	2	140	Natural	DM / SFP 001-NE corner 002-North of the road & ridges.South of road.
ALL	39 5 15	003, 004	AMA	RMR	54	Mid/Mat DF/ Tanoak		No Treatment											Reforestation Units
ALL	39 5 15	006	AMA	RMR	32	Mid/Mat DF/ Tanoak		No Treatment											
ALL	39 5 23	001	AMA	RMR	66	Mid DF		No Treatment											46 acres no treatment
						Mid DF	Mid	Poles			GB / C	PCT / SLB / HP			20	0.2	10	Natural	DM / SFP
ALL	39 5 23	002	Riparian Reserve	RMR	37	Mat POC	Mat POC	POC Exclusion RST	1-76	7-48	GB	SLB / SLD / UB / HP	18		6	2	12	No	Along county road
ALL	39 5 23	003	Riparian Reserve	FMR RTR	167	Mid POC	Mid POC	POC Exclusion				PCT / Snag Creation/ Retention / L & S		26					Reforestation Units

Table E-2: Description of proposed Unit treatments - in all vegetation treatment alternatives and Vegetation Treatment Alternatives V-1, V-2, V-3, V-4

Vegetation Treatment Action Alternative	T-R-Sec	OI#	Land Alloc.	TPCC	Unit Acres	Seral Stage / Vegetation Series		Prescription	DBH Range		Logging Systems	Slash Treatment -- Understory Treatment	Unit Timber vol. (MBF / ac) **(Est)**	Treat ac. (Est)	Timber harvest			Reforestation Needed	Comments (see footnotes)
						Current	Post Harvest		Stand (in)	Harvest (in)					Harv ac. (Est)	Vol ac. (Est)	Vol Total MBF (**Est**)		
						Mid/Mat POC	Mid/Mat POC	POC Exclusion RST	1-76	7-48	GB	SLB / SLD / UB / HP/ PCT	3		2	1	2	No	Along county road
ALL	39 5 23	004	Riparian Reserve	FMR RTR	8	Mid/DF Mat/POC	Mid/DF Mat/POC	POC Exclusion	1-76	7-48	GB	SLB / SLD PCT / UB / HP	15		2	1	2	No	PCT DF CYSC present
ALL	39 5 23	005	Riparian Reserve	FMR RTR	39	Mat POC	Mid POC	POC Exclusion PCT	1-76	7-48	GB	SLB / SLD / UB / HP / PCT	39		9	5	45	No	POC areas have higher volume/acre than unit as a whole CYSC present
						Mid DF		RST				Snag Creation/ Retention / L & S		1					
ALL	39 5 23	006, 011	AMA	RMR RTR	20	Mid DF		No Treatment											Reforestation Units
ALL	39 5 23	007	AMA	RTR	17	Early DF		No Treatment											
ALL	39 5 23	008	AMA	RTR	47	Mid DF	Mid	Poles				PCT / SLB / HP	5	47	10	0.2	5	Natural	DM / SFP
ALL	39 5 23	009, 013	AMA	RTR RMR	44	Early DF		No Treatment											Reforestation Units
ALL	39 5 23	010	Riparian Reserve	FMR RTR	21	Mid/DF Mat/POC	Mid/DF Mat/POC	POC Exclusion	1-76	7-48	GB	SLB / SLD / UB / HP / PCT	2		3	3	9	No	CYSC present
ALL	39 5 23	014	AMA	RMR	7	Mid DF		No Treatment											Water source
ALL	39 5 23	015	Riparian Reserve	FMR RTR	21	Mat POC	Mat POC	RST	1-76	7-48	GB	SLB / SLD / UB	15		2	2	4	No	Along county road

Table E-2: Description of proposed Unit treatments - in all vegetation treatment alternatives and Vegetation Treatment Alternatives V-1, V-2, V-3, V-4

Vegetation Treatment Action Alternative	T-R-Sec	OI#	Land Alloc.	TPCC	Unit Acres	Seral Stage / Vegetation Series		Prescription	DBH Range		Logging Systems	Slash Treatment -- Understory Treatment	Unit Timber vol. (MBF / ac) **(Est)**	Treat ac. (Est)	Timber harvest			Reforestation Needed	Comments (see footnotes)
						Current	Post Harvest		Stand (in)	Harvest (in)					Harv ac. (Est)	Vol ac. (Est)	Vol Total MBF **(Est)**		
ALL	39 5 23	016	Riparian Reserve	FMR RTR	10	Mid/DF Mat/POC	Mid/DF Mat/POC	POC Exclusion	1-76	7-48	GB	SLB / SLD / UB / HP / PCT	15		10	4	40	No	CYSC present
ALL	39 5 25	007	AMA	RTR	94			Hazard Reduction/ Hiking Trail				PCT / HP							Chinaman's Ditch
						Mid/Mat DF		No Treatment											
Totals for units common to all action alternatives.					**3081**									**1771**	301		511.4		
VEGETATION TREATMENT ALTERNATIVE V-1 THE FOLLOWING UNITS THAT ARE UNIQUE TO IT - ALSO INCLUDES UNITS COMMON TO ALL ACTION ALTERNATIVES																			
1	37 5 34	001, 002 003, 005	AMA	RMR RTR	71	Mat/Mid DF	Mat/Mid	CT	6-32	8-28	He	SLD / L & S	15		60	2	120	Natural	CH
1	38 4 19	015, 016 017	AMA	RTR	26	Mid DF	Mid	CT	8-48	8-28	GB / C He	SLD / L & S	10		60	3	180	Natural	CH
1	38 4 19	018, 020	AMA	RTR	67	Mid DF	Mid	CT	8-48	8-28	GB / C He	SLD / L & S	10		60	3	180	Natural	CH
1	38 5 3	002, 005	AMA	RMR	313	Mid DF	Mid	CT	8-32	8-24	GB / C He	SLD, L & S	18		90	5	450	Natural	CH
1	38 5 15	002	AMA	RMR	66	Mat DF/Pine	Mat	CT DF Patch Thinning Thin around Oak and Pine	4-60	8-28	He	SLD, L & S	10		50	3	150	Natural	CH Mines-Old roads
1	38 5 22	001	AMA	RTR	40	Mat DF/Pine	Mat	CT DF Patch Thinning Thin around Oak and Pine	4-60	8-28	He	SLD, L & S	10		30	3	90	Natural	CH

Table E-2: Description of proposed Unit treatments - in all vegetation treatment alternatives and Vegetation Treatment Alternatives V-1, V-2, V-3, V-4

Vegetation Treatment Action Alternative	T-R-Sec	OI#	Land Alloc.	TPCC	Unit Acres	Seral Stage / Vegetation Series		Prescription	DBH Range		Logging Systems	Slash Treatment -- Understory Treatment	Unit Timber vol. (MBF / ac) **(Est)**	Treat ac. (Est)	Timber harvest			Reforestation Needed	Comments (see footnotes)
						Current	Post Harvest		Stand (in)	Harvest (in)					Harv ac. (Est)	Vol ac. (Est)	Vol Total MBF (**Est**)		
1	38 5 24	001	AMA	RMR	17	Mat/OG DF	Mat/OG	GS	6-48	8-24	He	SLD, L & S	35		10	6	60	Natural	CH
1	38 5 24	002, 003 004	AMA	RMR	61	Mid DF	Mid	CT	6-24	8-20	He	SLD, L & S	12		40	2	80	Natural	CH - Harvest occasional 24"
1	38 5 25	001	AMA	RMR	140	Mat DF	Mat	CT/GS and GS	8-42	8-24	T,C,He	SLD, L & S	28		60	8	480	Natural	CH
1	38 5 25	005	AMA	RTR	50	Mat DF	Mat	CT	8-28	8-24	GB / C He	SLD, L & S	20		20	6	120	Natural	CH
1	38 5 33	001	Riparian Reserve	RMR	238	Mat DF/Pine	Mat	CT	8-32	12-24	GB / He	SLD, L & S	15		4	3	12	Natural	CH
			AMA			Mat/OG DF	Mat/OG DF	No Treatment											120 acres - change TPCC to 'W'
						Mat DF/Pine	Mat	CT	8-60	8-24	GB / He	SLD, L & S	15		56	3	168	Natural	CH - Enhance Pine sites
1	38 5 35	004	AMA	RTR	54	Mid DF/Pine	Mid	CT	8-56	8-36	GB / He	SLD, L & S	12		40	3	120	Natural	CH - Crown Thinning
1	38 5 35	005	AMA	RTR	66	Mat DF/Pine	Mat	CT	8-36	8-32	He	SLD, L & S	15		40	3	120	Natural	CH - Crown Thinning
1	39 5 1	002, 003	AMA	RTR	53	Mid/Mat DF/Pine/ Oak	Mid/Mat	CT/GS	8-40	8-32	He	SLD, L & S	20		45	5	225	Natural	CH
1	39 5 1	005	AMA	RMR	53	Mid DF/Pine	Mid	CT/GS	8-40	8-28	He	SLD, L & S	18		45	5	225	Natural	CH
1	39 5 1	006	AMA	RTR	67	Mid/Mat DF/Pine/ Oak	Mid/Mat	CT/GS	8-44	8-32	He	SLD, L & S	15		40	3	120	Natural	CH
1	39 5 1	007	AMA	RMR	97	Mat DF/Pine	Mat	CT/GS	8-52	8-32	He	SLD, L & S	20		75	5	375	Natural	CH

Table E-2: Description of proposed Unit treatments - in all vegetation treatment alternatives and Vegetation Treatment Alternatives V-1, V-2, V-3, V-4

Vegetation Treatment Action Alternative	T-R-Sec	OI#	Land Alloc.	TPCC	Unit Acres	Seral Stage / Vegetation Series		Prescription	DBH Range		Logging Systems	Slash Treatment -- Understory Treatment	Unit Timber vol. (MBF / ac) **(Est)**	Treat ac. (Est)	Timber harvest			Reforestation Needed	Comments (see footnotes)
						Current	Post Harvest		Stand (in)	Harvest (in)					Harv ac. (Est)	Vol ac. (Est)	Vol Total MBF (**Est**)		
1	39 5 1	010	AMA	RTR	172	Mid Pine/Oak	Mid	CT/GS	8-32	8-24	He	SLD, L & S	5		20	2	40	Natural	CH
1	39 5 6	001	AMA	RTR	40	Mid/Mat DF	Mid/Mat	CT	4-32	4-24	T / He	SLD, L & S	15		15	2	30	Natural	CH
1	39 5 12	002	AMA	RTR	40	Mid DF/Pine	Mid	Enhance Pine/Oak Remove DF	8-36	8-24	T / C	PCT / SLD / HP	15		25	4	100	Natural	CH - Below rd. and 5 ac. SE corner of unit
1	39 5 12	009, 013	AMA	RTR RMR	49	Mid DF	Mid	CT	4-52	8-32	T / C	SLD / L & S	15		15	4	60	Natural	CH - Crown Thinning Pine below road
1	39 5 13	004, 012	AMA	RTR RMR	18	Mid DF	Mid	CT	4-52	8-32	T / C	004- SLD / L & S 012- No understory treatment	15		15	4	60	Natural	CH- Crown Thinning. Pine below road
1	39 5 13	005	AMA	RTR	21	Mid DF	Mid	CT	4-52	8-32	C	SLD / L & S	12		12	4	48	Natural	CH Crown Thinning
1	39 5 14	008	AMA	RTR	123	Mid/Mat DF	Mid/Mat	CT	4-60	12-28	C,He	SLD / HP	25		20	8	160	Natural	CH
TOTAL FOR UNITS IN ALTERNATIVE V-1					1942									0	947		3773		
TOTAL OF UNITS COMMON TO ALL ACTION ALTERNATIVES					3081									1771	301		511.4		
GRAND TOTAL FOR ALTERNATIVE V-1					5023									1771	1248		4284		
VEGETATION TREATMENT ALTERNATIVE #V-2 THE FOLLOWING UNITS THAT ARE UNIQUE TO IT - ALSO INCLUDES UNITS COMMON TO ALL ACTION ALTERNATIVES																			
2	37 5 34	001, 002 003, 005	AMA	RMR RTR	71	Mat/Mid DF	Mat/Mid	CT	6-32	8-28	He	SLD / L & S	15		60	2	120	Natural	CH
2	38 4 19	015, 016 017	AMA	RTR	26	Mid DF	Mid	CT	8-48	8-28	T / C He	SLD / L & S	10		20	3	60	Natural	CH

Table E-2: Description of proposed Unit treatments - in all vegetation treatment alternatives and Vegetation Treatment Alternatives V-1, V-2, V-3, V-4

Vegetation Treatment Action Alternative	T-R-Sec	OI#	Land Alloc.	TPCC	Unit Acres	Seral Stage / Vegetation Series		Prescription	DBH Range		Logging Systems	Slash Treatment -- Understory Treatment	Unit Timber vol. (MBF / ac) **(Est)**	Treat ac. (Est)	Timber harvest			Reforestation Needed	Comments (see footnotes)
						Current	Post Harvest		Stand (in)	Harvest (in)					Harv ac. (Est)	Vol ac. (Est)	Vol Total MBF (**Est**)		
2	38 4 19	018, 020	AMA	RTR	67	Mid DF	Mid	CT	8-48	8-28	T / C He	SLD / L & S	10		60	3	180	Natural	CH
2	38 5 3	002, 005	AMA	RMR	313	Mid DF	Mid	GS	8-32	8-24	T / C He	SLD / L & S	18		30	15	450	Natural	CH
2	38 5 15	002	AMA	RMR	66	Mat DF/Pine	Mat	CT - DF patch thinning. Thin around Oak & Pine	4-60	8-28	He	SLD / L & S	10		50	3	150	Natural	CH Mines-Old roads
2	38 5 22	001	AMA	RTR	40	Mat DF/Pine	Mat	CT DF patch thinning Thin around Oak and Pine	4-60	8-28	He	SLD / L & S	10		30	3	90	Natural	CH
2	38 5 24	001	AMA	RMR	17	Mat/OG DF		Deferred											CH
2	38 5 24	002, 003 004	AMA	RMR	61	Mid DF	Mid	CT	6-24	8-20	He	SLD / L & S	12		40	2	80	Natural	CH - Harvest occasional 24"
2	38 5 25	001	AMA	RMR	140	Mat DF	Mat	CT/GS and GS	8-42	8-24	T / C He	SLD / L & S	28		60	8	480	Natural	CH
2	38 5 25	005	AMA	RTR	50	Mat DF	Mat	CT	8-28	8-24	T / C He	SLD / L & S	20		20	6	120	Natural	CH
2	38 5 33	001	AMA	RMR	238	Mat DF/Pine	Mat	CT	8-60	8-24	T / He	SLD / L & S	15		56	3	168	Natural	CH Enhance pine sites
			Riparian Reserve			Mat DF/Pine	Mat	CT	8-32	12-24	T / He	SLD / L & S	15		4	3	12	Natural	CH
2	38 5 35	004	AMA	RTR	54	Mid DF/Pine	Mid	CT	8-56	8-36	T / He	SLD / L & S	12		40	3	120	Natural	CH Crown thinning
2	38 5 35	005	AMA	RTR	66	Mat DF/Pine	Mat	CT	8-36	8-32	C / T He	SLD / L & S	15		40	3	120	Natural	CH Crown thinning

Table E-2: Description of proposed Unit treatments - in all vegetation treatment alternatives and Vegetation Treatment Alternatives V-1, V-2, V-3, V-4

Vegetation Treatment Action Alternative	T-R-Sec	OI#	Land Alloc.	TPCC	Unit Acres	Seral Stage / Vegetation Series		Prescription	DBH Range		Logging Systems	Slash Treatment -- Understory Treatment	Unit Timber vol. (MBF / ac) **(Est)**	Treat ac. (Est)	Timber harvest			Reforestation Needed	Comments (see footnotes)
						Current	Post Harvest		Stand (in)	Harvest (in)					Harv ac. (Est)	Vol ac. (Est)	Vol Total MBF (**Est**)		
2	39 5 1	002, 003	AMA	RTR	53	Mid/Mat DF/Pine/ Oak	Mid/Mat	CT/GS	8-40	8-32	He	SLD / L & S	20		45	5	225	Natural	CH
2	39 5 1	005	AMA	RMR	53	Mid DF/Pine		Deferred											
2	39 5 1	006	AMA	RTR	67	Mid/Mat DF/Pine/ Oak	Mid/Mat	CT/GS	8-44	8-32	T / He	SLD / L & S	15		40	3	120	Natural	CH
2	39 5 1	007	AMA	RMR	97	Mat DF/Pine	Mat	GS	8-52	8-32	He	SLD / L & S	20		25	12	300	Natural	CH
2	39 5 1	010	AMA	RTR	172	Mid Pine/Oak	Mid	CT/GS	8-32	8-24	T / He	SLD / L & S	5		20	2	40	Natural	CH
2	39 5 6	001	AMA	RTR	40	Mid/Mat DF	Mid/Mat	CT	4-32	4-24	T / He	SLD / L & S	15	40	15	2	30	Natural	CH
2	39 5 12	002	AMA	RTR	40	Mid DF/Pine	Mid	Enhance Pine/Oak Remove DF	8-36	8-24	T / C	PCT / SLD HP	15		25	4	100	Natural	CH Below road. 5 ac. SE corner
2	39 5 12	009, 013	AMA	RTR RMR	49	Mid DF	Mid	Crown Thinning Pine below road	4-52	8-32	C	SLD / L & S	15		15	4	60	Natural	CH
2	39 5 13	004, 012	AMA	RTR RMR	18	Mid DF	Mid	Crown Thinning Pine below road	4-52	8-32	C	SLD / L & S 004-thin understory 012-no thin understory	15		15	4	60	Natural	CH
2	39 5 13	005	AMA	RTR	21	Mid DF	Mid	Crown Thinning	4-52	8-32	C	SLD / L & S	12		12	4	48	Natural	CH
2	39 5 14	008	AMA	RTR	123	Mid/Mat DF	Mid/Mat	CT	4-60	12-28	C,He	SLD / HP	25		20	8	160	Natural	CH

Table E-2: Description of proposed Unit treatments - in all vegetation treatment alternatives and Vegetation Treatment Alternatives V-1, V-2, V-3, V-4

Vegetation Treatment Action Alternative	T-R-Sec	OI#	Land Alloc.	TPCC	Unit Acres	Seral Stage / Vegetation Series		Prescription	DBH Range		Logging Systems	Slash Treatment -- Understory Treatment	Unit Timber vol. (MBF / ac) **(Est)**	Treat ac. (Est)	Timber harvest			Reforestation Needed	Comments (see footnotes)
						Current	Post Harvest		Stand (in)	Harvest (in)					Harv ac. (Est)	Vol ac. (Est)	Vol Total MBF **(Est)**		
TOTAL FOR UNITS IN ALTERNATIVE V-2					1942									40	742		3293		
TOTAL OF UNITS COMMON TO ALL ACTION ALTERNATIVES					3081									1771	301		511.4		
GRAND TOTAL FOR ALTERNATIVE V-2					5023									1811	1043		3804		
VEGETATION TREATMENT ALTERNATIVE V-3 THE FOLLOWING UNITS THAT ARE UNIQUE TO IT - ALSO INCLUDES UNITS COMMON TO ALL ACTION ALTERNATIVES																			
3	37 5 34	001, 002 003, 005	AMA	RMR RTR	71	Mat/Mid DF	Mat/Mid	CT	6-32	8-28	He	SLD / L & S	15		60	2	120	Natural	CH
3	38 4 19	015, 016 017	AMA	RTR	26	Mid DF	Mid	CT	4-48	8-28	GB / C He	SLD / L & S	10		20	3	60	Natural	CH
3	38 4 19	018, 020	AMA	RTR	67	Mid DF		Deferred				PCT / L & S		50					Only CH Deferred
3	38 5 3	002, 005	AMA	RMR	313	Mid DF	Mid	GS	8-32	8-24	T / C He	SLD / L & S	18		30	15	450	Natural	CH
3	38 5 15	002	AMA	RMR	66	Mat DF/Pine	Mat	CT - DF patch thinning. Thin around Oak and Pine	4-60	8-28	He	SLD / L & S	10		50	3	150	Natural	CH Mines-Old roads
3	38 5 22	001	AMA	RTR	40	Mat DF/Pine		Deferred											
3	38 5 24	001	AMA	RMR	17	Mat/OG DF		Deferred											
3	38 5 24	002, 003 004	AMA	RMR	61	Mid DF	Mid	CT	6-24	8-20	He	SLD / L & S	12		40	2	80	Natural	CH - Harvest occasional 24"
3	38 5 25	001	AMA	RMR	140	Mat DF	Mat	CT/GS and GS	8-42	8-24	T/C/He	SLD / L & S	28		60	8	480	Natural	CH

Table E-2: Description of proposed Unit treatments - in all vegetation treatment alternatives and Vegetation Treatment Alternatives V-1, V-2, V-3, V-4

Vegetation Treatment Action Alternative	T-R-Sec	OI#	Land Alloc.	TPCC	Unit Acres	Seral Stage / Vegetation Series		Prescription	DBH Range		Logging Systems	Slash Treatment -- Understory Treatment	Unit Timber vol. (MBF / ac) **(Est)**	Treat ac. (Est)	Timber harvest			Reforestation Needed	Comments (see footnotes)
						Current	Post Harvest		Stand (in)	Harvest (in)					Harv ac. (Est)	Vol ac. (Est)	Vol Total MBF (**Est**)		
3	38 5 25	005	AMA	RTR	50	Mat DF		Deferred											
3	38 5 33	001	Riparian Reserve	RMR	238	Mat DF/Pine	Mat	CT	8-32	12-24	GB / He	SLD / L & S	15		4	3	12	Natural	CH
			AMA			Mat DF/Pine	Mat	CT	8-60	8-24	GB / He	SLD / L & S	15		56	3	168	Natural	CH Enhance Pine sites
3	38 5 35	004	AMA	RTR	54	Mid DF/Pine	Mid	CT	8-56	8-36	GB / He	SLD / L & S	12		40	3	120	Natural	CH Crown Thinning
3	38 5 35	005	AMA	RTR	66	Mat DF/Pine		Deferred											
3	39 5 1	002, 003	AMA	RTR	53	Mid/Mat DF/Pine/ Oak	Mid/Mat	CT/GS	8-40	8-32	He	SLD / L & S	20		45	5	225	Natural	CH
3	39 5 1	005	AMA	RMR	53	Mid DF/Pine		Deferred											
3	39 5 1	006	AMA	RTR	67	Mid/Mat DF/Pine/ Oak	Mid/Mat	CT/GS	8-44	8-32	He	SLD / L & S	15		40	3	120	Natural	CH
3	39 5 1	007	AMA	RMR	97	Mat DF/Pine		Deferred											
3	39 5 1	010	AMA	RTR	172	Mid Pine/Oak	Mid	CT/GS	8-32	8-24	He	SLD / L & S	5		20	2	40	Natural	CH
3	39 5 6	001	AMA	RTR	40	Mid/Mat DF	Mid/Mat	Poles only				SLB / HP	15	40	15	1	15	Natural	DM / SFP
3	39 5 12	002	AMA	RTR	40	Mid DF/Pine	Mid	Enhance Pine/Oak Remove DF	8-36	8-24	T / C	PCT / SLD HP	15		25	4	100	Natural	CH - Below road 5 ac. SE corner of unit.

Table E-2: Description of proposed Unit treatments - in all vegetation treatment alternatives and Vegetation Treatment Alternatives V-1, V-2, V-3, V-4

Vegetation Treatment Action Alternative	T-R-Sec	OI#	Land Alloc.	TPCC	Unit Acres	Seral Stage / Vegetation Series		Prescription	DBH Range		Logging Systems	Slash Treatment -- Understory Treatment	Unit Timber vol. (MBF / ac) **(Est)**	Treat ac. (Est)	Timber harvest			Reforestation Needed	Comments (see footnotes)
						Current	Post Harvest		Stand (in)	Harvest (in)					Harv ac. (Est)	Vol ac. (Est)	Vol Total MBF (**Est**)		
3	39 5 12	009, 013	AMA	RTR RMR	49	Mid DF	Mid	CT	4-52	8-32	T / C	SLD / L & S	15		15	4	60	Natural	CH Crown thinning pine below road
3	39 5 13	004, 012	AMA	RTR RMR	18	Mid DF	Mid	CT	4-52	8-32	T / C	004-SLD / L & S 012 - no understory treatment	15		15	4	60	Natural	CH Crown thinning pine below road
3	39 5 13	005	AMA	RTR	21	Mid DF	Mid	CT	4-52	8-32	C	SLD / L & S	12		12	4	48	Natural	CH Crown thinning
3	39 5 14	008	AMA	RTR	123	Mid/Mat DF		Deferred											20 ac. west of quarry
TOTAL FOR UNITS IN ALTERNATIVE V-3					1942									90	547		2308		
TOTAL OF UNITS COMMON TO ALL ACTION ALTERNATIVES					3081									1771	301		511.4		
GRAND TOTAL FOR ALTERNATIVE V-3					5023									1861	848		2819		
VEGETATION TREATMENT ALTERNATIVE #V-4 THE FOLLOWING UNITS THAT ARE UNIQUE TO IT - ALSO INCLUDES UNITS COMMON TO ALL ACTION ALTERNATIVES																			
4	37 5 34	001, 002 003, 005	AMA	RMR RTR	71	Mat/Mid DF	Mat/Mid	CT	6-32	8-28	He	SLD / L & S	15		60	2	120	Natural	CH
4	38 4 19	015, 016 017	AMA	RTR	26	Mid DF	Mid	CT	8-48	8-28	GB / C He	SLD / L & S	10		20	3	60	Natural	CH
4	38 4 19	018, 020	AMA	RTR	67	Mid DF	Mid	CT	8-48	8-28	GB / C He	SLD / L & S	10		60	3	180	Natural	CH
4	38 5 3	002, 005	AMA	RMR	313	Mid DF	Early	Structural Retention / GS	8-32	8-24	T / C He	UB	18		90	6	540	Plant	CH 30 Ac. GS

Table E-2: Description of proposed Unit treatments - in all vegetation treatment alternatives and Vegetation Treatment Alternatives V-1, V-2, V-3, V-4

Vegetation Treatment Action Alternative	T-R-Sec	OI#	Land Alloc.	TPCC	Unit Acres	Seral Stage / Vegetation Series		Prescription	DBH Range		Logging Systems	Slash Treatment -- Understory Treatment	Unit Timber vol. (MBF / ac) **(Est)**	Treat ac. (Est)	Timber harvest			Reforestation Needed	Comments (see footnotes)
						Current	Post Harvest		Stand (in)	Harvest (in)					Harv ac. (Est)	Vol ac. (Est)	Vol Total MBF (**Est**)		
4	38 5 15	002	AMA	RMR	66	Mat DF/Pine	Mat	CT DF Patch Thinning; Thin around Oak and Pine	4-60	8-28	He	SLD / L & S	10		50	3	150	Natural	CH Mines-Old roads
4	38 5 22	001	AMA	RTR	40	Mat DF/Pine	Mat	CT DF Patch Thinning Thin around Oak and Pine	4-60	8-28	He	SLD / L & S	10		30	3	90	Natural	CH
4	38 5 24	001	AMA	RMR	17	Mat/Old Growth DF	Early	> 150 yrs. Structural Retention	6-48	8-24	T/C/He	UB	35		10	8	80	Plant	CH
4	38 5 24	002, 003 004	AMA	RMR	61	Mid DF	Mid	CT	6-24	8-20	He	SLD / L & S	12		40	2	80	Natural	CH - Harvest occasional 24"
4	38 5 25	001	AMA	RMR	140	Mat DF	Early	Structural Retention / GS	8-42	8-24	He	UB	28		75	15	1,125	Plant	CH 30 Ac. = GS
4	38 5 25	005	AMA	RTR	50	Mat DF	Early	Structural Retention	8-28	8-24	T / C He	UB	20		20	8	160	Plant	CH
4	38 5 33	001	Riparian Reserve	RMR	238	Mat DF/Pine	Mat	CT	8-32	12-24	GB / He	SLD / L & S	15		4	3	12	Natural	CH
			AMA			Mat DF/Pine	Mat	CT	8-60	8-24	GB / He	SLD / L & S	15		56	3	168	Natural	CH Enhance Pine sites
4	38 5 35	004	AMA	RTR	54	Mid DF/Pine	Mid	CT	8-56	8-36	GB / He	SLD / L & S	12		40	3	120	Natural	CH Crown Thinning
4	38 5 35	005	AMA	RTR	66	Mat DF/Pine	Early	Structural Retention	8-36	8-32	He	UB	15		40	5	200	Plant	CH

Table E-2: Description of proposed Unit treatments - in all vegetation treatment alternatives and Vegetation Treatment Alternatives V-1, V-2, V-3, V-4

Vegetation Treatment Action Alternative	T-R-Sec	OI#	Land Alloc.	TPCC	Unit Acres	Seral Stage / Vegetation Series		Prescription	DBH Range		Logging Systems	Slash Treatment -- Understory Treatment	Unit Timber vol. (MBF / ac) **(Est)**	Treat ac. (Est)	Timber harvest			Reforestation Needed	Comments (see footnotes)
						Current	Post Harvest		Stand (in)	Harvest (in)					Harv ac. (Est)	Vol ac. (Est)	Vol Total MBF (**Est**)		
4	39 5 1	002, 003	AMA	RTR	53	Mid/Mat DF/Pine/ Oak	Early	Structural Retention	8-40	8-32	He	UB	20		45	7	315	Plant	CH
4	39 5 1	005	AMA	RMR	53	Mid DF/Pine	Early	Structural Retention	8-40	8-28	He	UB	18		45	7	315	Plant	CH
4	39 5 1	006	AMA	RTR	67	Mid/Mat DF/Pine/ Oak	Mid/Mat	CT/GS	8-44	8-32	He	SLD / L & S	15		40	3	120	Natural	CH
4	39 5 1	007	AMA	RMR	97	Mat DF/Pine	Mat	Structural Retention	8-52	8-32	He	SLD / L & S	20		75	7	525	Plant	CH
4	39 5 1	010	AMA	RTR	172	Mid Pine/Oak	Mid	CT/GS	8-32	8-24	He	SLD / L & S	5		20	2	40	Natural	CH
4	39 5 6	001	AMA	RTR	40	Mid/Mat DF	Mid/Mat	CT	4-32	4-24	T / He	SLD / L & S	15		15	2	30	Natural	CH
4	39 5 12	002	AMA	RTR	40	Mid DF/Pine	Mid	Enhance Pine/Oak Remove DF	8-36	8-24	T / C	PCT / SLD / HP	15		25	4	100	Natural	CH Below rd. And 5 ac. SE corner of unit.
4	39 5 12	009, 013	AMA	RTR RMR	49	Mid DF	Mid	CT	4-52	8-32	T / C	SLD / L & S	15		15	4	60	Natural	CH Crown Thinning Pine below road
4	39 5 13	004, 012	AMA	RTR RMR	18	Mid DF	Mid	CT	4-52	8-32	T / C	004-SLD / L & S 012- No understory treatment	15		15	4	60	Natural	CH Crown Thinning Pine below road
4	39 5 13	005	AMA	RTR	21	Mid DF	Mid	CT	4-52	8-32	C	SLD / L & S	12		12	4	48	Natural	CH Crown Thinning
4	39 5 14	008	AMA	RTR	123	Mid/Mat DF	Early	Structural Retention	4-60	12-28	C,He	UB	25		20	12	240	Plant	CH

Table E-2: Description of proposed Unit treatments - in all vegetation treatment alternatives and Vegetation Treatment Alternatives V-1, V-2, V-3, V-4

Vegetation Treatment Action Alternative	T-R-Sec	OI#	Land Alloc.	TPCC	Unit Acres	Seral Stage / Vegetation Series		Prescription	DBH Range		Logging Systems	Slash Treatment -- Understory Treatment	Unit Timber vol. (MBF / ac) **(Est)**	Treat ac. (Est)	Timber harvest			Reforestation Needed	Comments (see footnotes)
						Current	Post Harvest		Stand (in)	Harvest (in)					Harv ac. (Est)	Vol ac. (Est)	Vol Total MBF **(Est)**		
TOTALS FOR UNITS IN ALTERNATIVE V-4					1942									0	922		4938		
TOTAL UNITS COMMON TO ALL ACTION ALTERNATIVES					3081									1771	301		511.4		
GRAND TOTAL FOR ALTERNATIVE V-4					5023									1771	1223		5449		

Footnotes and acronyms:

1) *Proposed silvicultural prescription:*

CT - Commercial thin. *GS - Group Selection* *ITM - Individual Tree Mark* *RST - POC Roadside Treatment*

PCT - Precommercially thin conifers to approximately a sixteen (16) foot by sixteen (16) foot spacing, plus or minus twenty (20)%. Thinned clumps (largest three stems) of hardwoods, will be spaced approximately twenty (20) feet apart.

Logging System: T - Tractor *C - Cable* *HE - Helicopter* *CS - Cable swing* *GB - Ground Base (tractor, mechanical harvest, skidder, horse, ATV, etc.)*

Proposed slash treatment and understory treatment:

SLD - Slash sprung and damaged conifers and hardwoods 1"-6" DBH. *SLB - Slash brush species*

PCT - Precommercially thin conifers to approximately a sixteen (16) foot by sixteen (16) foot spacing, plus or minus 20%. Thinned clumps (largest three stems) of hardwoods, will be spaced approximately twenty (20) feet apart.

UB - Underburn, mosaic or spot broadcast burn under reserved overstory. *HP - Hand pile slash 1"-6" x 2', cover, and burn piles*

L & S - Lop and Scatter created fuels

Comments:

DM / SFP - Density Management / Special Forest Products. *FR / HE - Fuels Reduction / Habitat Enhancement*

CH - Commercial Harvest

Chinaman's Ditch - Old Layton Mining Ditch

2) TPCC (Timber Productivity Capability Classification):

RTR - regeneration restricted due to hot temperatures and low soil moisture; RMR- regeneration restricted due to low soil moisture;

RTW - withdrawn due to hot temperatures; FMR - restricted due to fragile erosive soils; LSW - withdrawn due to low site

3) Stand Successional Stage:

Early - Vegetation is dominated by shrubs or conifers and hardwood trees in a seedling/ sapling size class (<5"DBH)

Mid - Vegetation is tree dominated. Trees at least small pole size (>4"DBH). Larger scattered trees may be present

Mature - Forest has begun to differentiate into distinct canopy layers. Overstory dominant and co-dominant trees are conifers greater than 20" DBH, understory trees will be conifer/hardwood mix

Old Growth - Stand is multilayered and has at least two distinct canopy layers. Large conifer trees greater than 35" DBH number 8+/ac.

4) Harvest acres vs. Unit acres: The difference in acreage is attributed to the large variability within the unit, unit inclusions of riparian reserves, non-forest, etc.

Note: T39S-R5W-Sec 12- OI# 009, 013 - These two units were not included on the project scoping map. During project planning development they were added to the project area.

Appendix F
Aquatic Conservation Strategy (ACS) Consistency Review
Scattered Apples Project

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

Treatments within the Riparian Reserves will be either brush removal, thinning, or burning. Brushing and thinning would have either minimal adverse impacts or beneficial impacts on landscape-scale features such as climate, fire regimes, and vegetation distribution. Burns would be conducted for wildlife habitat enhancement or fire hazard reduction. The natural fire regime in the Williams watershed has been suppressed, and these burns would be a partial restoration of this regime. Where Riparian Reserves are to be entered, the objective would be to hasten the development of mature stand conditions. Mature stands have been diminished in number in the watershed, and encouraging their development would help restore the diversity and complexity of watershed scale features by promoting a diminished habitat type.

2. *Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include flood plains, wetlands, up slope 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 Williams watershed has natural fragmentation created by different vegetation types. Vegetation communities vary depending upon elevation, aspect, and moisture. That fragmentation has been increased by human activity within the watershed, making connectivity a critical issue within the area. Riparian Reserves are natural corridors for movement and migration of many species of plants and animals. Their linear nature connects up slope areas with moister areas such as flood plains and wetlands. The drainage network provides well-distributed riparian areas throughout the valley, connecting habitats via nutrient-rich corridors. In one section of this project, there is a spreading infection of *Phytophthora lateralis*, which will be addressed by killing Port Orford cedars to create zones with no cedar to halt the spread of the disease. This treatment aims at long-term preservation of this tree species within the watershed. Due to the action of the spreading pathogen, this treatment is deemed necessary despite short-term decreases in stream health that will result in increased stream temperatures and loss of cedar canopy. All other treatments within Riparian Reserves will preserve an unentered buffer for 25 ft. on either side of the streams for all classes. For class 4 streams: (a) a no treatment buffer 0 to 25 feet from edge of channel, and (b) in the zone from 25 ft. to 150 ft. from the channel the canopy cover will be thinned to approximately 60% or left unthinned if closure is currently below 60%. These precautions will provide physical cover, cool temperatures, moist conditions, and food sources for any organisms that utilize riparian areas. These organisms include fungi, non-vascular plants, vascular plants, mollusks, salamanders, songbirds, and mammals.

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

The no-treatment buffers along streams will protect the physical stream systems. In addition, the prescription along class 4 streams calls for 40% of the area between 25 ft. and 150 ft. from the channel to be unentered. The areas selected to be unentered would include areas where entry might impact the physical integrity of the channel. In places where treatment will occur, that treatment will accelerate the recruitment of logs into the stream. Acceleration of the growth of large trees and girdling of some trees in dense stands will lead to the eventual recruitment of logs into the streams at a faster rate than without treatment. Some of these logs will add to the structure of the stream, creating pools and cover that are critical fish habitat.

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

Proposed treatments would not impact streams chemically. Canopy cover retention will protect the temperature regimes of the streams. As explained above, treatment in Riparian Reserves will accelerate the recruitment of logs into the streams. These logs will act as sediment traps, reducing suspended particulate matter in the water.

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

Increased sedimentation is the main concern for these streams. The no-entry buffers would protect streams from the sediments that would be loosened by thinning operations and burns. Road construction is minimal, and does not occur in the riparian reserves. POC sanitation work will include the subsoiling of some skid roads that are contributing sediment to the stream. Some roads will be decommissioned, and others will be obliterated. These activities will cause a short-term increase in sedimentation, but a long-term decrease in sedimentation as vegetation regrows on the old skid roads.

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

Most of the physical changes in streams occur during short-duration high-flow events. In this region, the most intense of these events occur when rain falls on snow, adding snow melt to the runoff of the rainstorm. During these events, streams are at risk to experience debris flows that can uproot trees and remove substrate, often leaving a stream flowing over bedrock with little riparian vegetation. Buffers and canopy cover retention within riparian areas will protect the vegetation, particularly the root structures, that slow the movement of water from uplands into the channel. Canopy cover over streams will also be retained, protecting streams from increased evaporation. Road obliteration and decommissioning will help restore instream flows, particularly during low flows of August and September, because roads expedite runoff rather than absorbing water into the soil, and because poorly maintained roads frequently redirect water flow. Also, logs added to streams through recruitment will help to retain water in pools in times of low flow. The most

crucial areas to protect are within the transient snow zone, where rain-on-snow events originate. In the Williams watershed, this zone is around 3,000' elevation. The Scattered Apples project almost entirely involves treatment areas below this elevation (approximately 15-20 acres is above 3,000'.).

7. *Maintain and restore the timing, variability, and duration of flood plain inundation and water table elevation in meadows and wetlands.*

Treatments proposed for Riparian Reserves will not impact the inundation of meadows and wetlands. Wetlands and meadows will receive 150 ft. buffers, except where meadows are to be burned for fire hazard reduction and wildlife habitat enhancement. Flood plain connectivity should not be affected by the proposed treatments.

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

All treatments in the Riparian Reserves will act to restore structural diversity. Any thinning will retain logs to equal the average quantities of down wood in unentered stands (as calculated by Jimerson, 1989 and Bingham and Sawyer, 1991). Treatment of areas infected with *Phytophthora lateralis* will result in a decrease of the amounts of Port Orford cedar in these stands. However, scientific evidence suggests that the POC may be eliminated if efforts are not made to control the spread of infection. Thus, this action is intended to result in the long-term preservation of species composition. In some cases, trees may be girdled and left standing to equal the average quantities of snags in unentered stands. Some POC to be killed will be placed in East Fork immediately in order to add coarse woody material. Others will be recruited over time from POC killed and left standing. Diversity of plant communities will be maintained in the prescriptions for brushing and thinning, as well as in the no-entry buffered areas.

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

The no-entry buffers will maintain habitat areas for these species, by retaining food sources, physical cover, and cool and moist conditions. The thinned areas will move more rapidly to old-growth conditions within Riparian Reserves. Larger trees will develop more quickly, and these trees have a much greater impact on improving the habitat of riparian areas throughout their life span than do small trees. Thus, habitat will be maintained in the immediate future in some parts of the Riparian Reserves, and enhanced in the long-term in other parts.

Appendix G
Acronyms and Glossary of Terms

I. Acronyms/Abbreviations

AMA	-	Adaptive Management Area
CT	-	Commercial thinning
CWD	-	Coarse Woody Debris
DBH	-	Diameter at breast height
GFMA	-	General Forest Management Area
GS	-	Group Selection
IDT	-	Interdisciplinary team
LSR(s)	-	Late Successional Reserve(s)
LUA	-	Land Use Allocation
MBF	-	Thousand Board Feet
NEPA	-	National Environmental Policy Act
OI	-	Operations Inventory
PCT	-	Precommercial thinning
RMP	-	Resource Management Plan
ROD	-	Record of Decision
SFP(s)	-	Special Forest Product(s)
T&E	-	Threatened and Endangered (species)
TPCC	-	Timber Production Capability Classification
VRM	-	Visual Resource Management

Glossary
(From Medford District RMP)

Adaptive Management Areas - Landscape units designated for development and testing of technical and social approaches to achieving desired ecological, economic, and other social objectives.

Age Class - One of the intervals into which the age range of trees is divided for classification or use.

Allowable Sale Quantity (ASQ) - The gross amount of timber volume, including salvage, that may be sold annually from a specified area over a stated period of time in accordance with the management plan. Formerly referred to as "allowable cut."

Anadromous Fish - Fish that are born and reared in freshwater, move to the ocean to grow and mature, and return to freshwater to reproduce. Salmon, steelhead, and shad are examples.

Aquatic Ecosystem - Any body of water, such as a stream, lake, or estuary, and all organisms and nonliving components within it, functioning as a natural system.

Aquatic Habitat - Habitat that occurs in free water.

Biological Diversity - The variety of life and its processes.

Bureau Assessment Species - Plant and animal species on List 2 of the Oregon Natural Heritage Data Base, or those species on the Oregon List of Sensitive Wildlife Species (OAR 635-100-040), which are identified in BLM Instruction Memo No. OR-91-57, and are not included as federal candidate, state listed or Bureau sensitive species.

Bureau Sensitive Species - Plant or animal species eligible for federal listed, federal candidate, state lsted, or state candidate (plant) status, or on List 1 in the Oregon Natural Heritage Data Base, or approved for this category by the State Director.

Candidate Species - Those plants and animals included in Federal Register "Notices of Review" that are being considered by the Fish and Wildlife Service (FWS) for listing as threatened or endangered. There are two categories that are of primary concern to BLM. These are:

Category 1. Taxa for which the Fish and Wildlife Service has substantial information on hand to support proposing the species for listing as threatened or endangered. Listing proposals are either being prepared or have been delayed by higher priority listing work.

Category 2. Taxa for which the Fish and Wildlife Service has information to indicate that listing is possibly appropriate. Additional information is being collected.

Canopy - The more or less continuous cover of branches and foliage formed collectively by adjacent trees and other woody species in a forest stand. Where significant height differences occur between trees within a stand, formation of a multiple canopy (multi-layered) condition can result.

Climax Plant Community - The theoretical, final stable, self-sustaining, and self reproducing state of plant community development that culminates plant succession on any given site. Given a long period of time between disturbances, plant associations on similar sites under similar climatic conditions approach the same species mixture and structure. Under natural conditions, disturbance events of various intensities and frequencies result in succession usually culminating as sub-climax with the theoretical end point occurring rarely of at all.

Coarse Woody Debris - Portion of tree that has fallen or been cut and left in the woods. Usually refers to pieces at least 20 inches in diameter. FEMAT

Commercial Thinning - The removal of merchantable trees from an even-aged stand to encourage growth of the remaining trees.

Connectivity - A measure of the extent to which conditions between late-successional/old-growth forest areas provide habitat for breeding, feeding, dispersal, and movement of late-successional/old-growth-associated wildlife and fish species.

Cover - Vegetation used by wildlife for protection from predators, or to mitigate weather conditions, or to reproduce. May also refer to the protection of the soil and the shading provided to herbs and forbs by vegetation.

Critical Habitat - Under the Endangered Species Act, (1) the specific areas within the geographic area occupied by a federally listed species on which are found physical and biological features essential to the conservation of the species, and that may require special management considerations or protection; and (2) specific areas outside the geographic area occupied by a listed species when it is determined that such areas are essential for the conservation of the species.

Cultural Resource - Any definite location of past human activity identifiable through field survey, historical documentation, or oral evidence; includes archaeological or architectural sites, structures, or places, and places of traditional cultural or religious importance to specified groups whether or not represented by physical remains.

Cultural Site - Any location that includes prehistoric and/or historic evidence of human use or that has important sociocultural value.

Cumulative Effect - The impact which results from identified actions when they are added to other past, present, and reasonably foreseeable future actions regardless of who undertakes such other actions. Cumulative effects can result

from individually minor but collectively significant actions taking place over a period of time.

Density Management - Cutting of trees for the primary purpose of widening their spacing so that growth of remaining trees can be accelerated. Density management harvest can also be used to improve forest health, to open the forest canopy, or to accelerate the attainment of old growth characteristics if maintenance or restoration of biological diversity is the objective.

Designated Area - An area identified in the Oregon Smoke Management Plan as a principal population center requiring protection under state air quality laws or regulations.

Developed Recreation Site - A site developed with permanent facilities designed to accommodate recreation use.

Diameter At Breast Height (DBH) - The diameter of a tree 4.5 feet above the ground on the uphill side of the tree.

Ecosystem Diversity - The variety of species and ecological processes that occur in different physical settings.

Ecosystem Management - The management of lands and their resources to meet objectives based on their whole ecosystem function rather than on their character in isolation. Management objectives blend long-term needs of people and environmental values in such a way that the lands will support diverse, healthy, productive and sustainable ecosystems.

Endangered Species - Any species defined through the Endangered Species Act as being in danger of extinction throughout all or a significant portion of its range and published in the Federal Register.

Environmental Assessment (EA) - A systematic analysis of site-specific BLM activities used to determine whether such activities have a significant effect on the quality of the human environment and whether a formal environmental impact statement is required; and to aid an agency's compliance with National Environmental Protection Agency when no Environmental Impact Statement is necessary.

Environmental Impact - The positive or negative effect of any action upon a given area or resource.

Ephemeral Stream - Streams that contain running water only sporadically, such as during and following storm events.

Forest Canopy - The cover of branches and foliage formed collectively by the crowns of adjacent trees and other woody growth.

Forest Health - The ability of forest ecosystems to remain productive, resilient, and stable over time and to withstand the effects of periodic natural or human-caused stresses such as drought, insect attack, disease, climatic changes, flood, resource management practices and resource demands.

Forest Land - Land that is now, or is capable of becoming, at least ten percent stocked with forest trees and that has not been developed for nontimber use.

Forest Succession - The orderly process of change in a forest as one plant community or stand condition is replaced by another, evolving towards the climax type of vegetation.

General Forest Management Area - Forest land managed on a regeneration harvest cycle of 70-110 years. A biological legacy of six to eight green trees per acre would be retained to assure forest health. Commercial thinning would be applied where practicable and where research indicates there would be gains in timber production.

Genetic Diversity - The variety within populations of a species.

Habitat Diversity - The number of different types of habitat within a given area.

Historic Site - A cultural resource resulting from activities or events dating to the historic period (generally post AD l830 in western Oregon).

Impact - A spatial or temporal change in the environment caused by human activity.

Intact Old Growth Habitat - Older fores types that have not been entered for logging or are lightly entered such that structural and functional characteristics of the forest are essentially unchanged, except in relation to the size of the habitat island, Typically, forests of coniferous series with crown closure above 70 percent. Also includes low site lands lacking the ecological potential to produce older forest habitat characteristics.

Intermittent Stream - Any nonpermanent flowing drainage feature having a definable channel and evidence of scour or deposition. This includes what are sometimes referred to as ephemeral streams if they meet these two criteria.

Land Use Allocations - Allocations which define allowable uses/activities, restricted uses/activities, and prohibited uses/activities. They may be expressed in terms of area such as acres or miles etc. Each allocation is associated with a specific management objective.

Landing - Any place on or adjacent to the logging site where logs are assembled for further transport.

Landscape Diversity - The size, shape and connectivity of different ecosystems across a large area.

Landscape Ecology - Principles and theories for understanding the structure, functioning, and change of landscapes over time. Specifically it considers (1) the development and dynamics of spatial heterogeneity, (2) interactions and exchanges across heterogeneous landscapes, (3) the influences of spatial heterogeneity on biotic and abiotic processes, and (4) the management of spatial heterogeneity. The consideration of spatial patterns

distinguishes landscape ecology from traditional ecological studies, which frequently assume that systems are spatially homogeneous.

Landscape Pattern - The number, frequency, size, and juxtaposition of landscape elements (patches) which are important to the determination or interpretation of ecological processes.

Late-Successional Forests - Forest seral stages which include mature and old-growth age classes.

Late-Successional Reserve - A forest in its mature and/or old-growth stages that has been reserved.

Log Decomposition Class - Any of five stages of deterioration of logs in the forest; stages range from essentially sound (class 1) to almost total decomposition (class 5).

Long-Term - The period starting ten years following implementation of the Resource Management Plan. For most analyses, long-term impacts are defined as those existing 100 years after implementation.

Long-Term Soil Productivity - The capability of soil to sustain inherent, natural growth potential of plants and plant communities over time.

Matrix Lands - Federal land outside of reserves and special management areas that will be available for timber harvest at varying levels.

Mature Stand - A mappable stand of trees for which the annual net rate of growth has peaked. Stands are generally greater than 80-100 years old and less than 180-200 years old. Stand age, diameter of dominant trees, and stand structure at maturity vary by forest cover types and local site conditions. Mature stands generally contain trees with a small average diameter, less age class variation, and less structural complexity than old-growth stands of the same forest type. Mature stages of some forest types are suitable habitat for spotted owls. However, mature forests are not always spotted owl habitat, and spotted owl habitat is not always mature forest.

Mining Claims - Portions of public lands claimed for possession of locatable mineral deposits, by locating and recording under established rules and pursuant to the 1872 Mining Law.

Mitigating Measures - Modifications of actions which (a) avoid impacts by not taking a certain action or parts of an action; (b) minimize impacts by limiting the degree or magnitude of the action and its implementation; (c) rectify impacts by repairing, rehabilitating or restoring the affected environment; (d) reduce or eliminate impacts over time by preservation and maintenance operations during the life of the action; or (e) compensate for impacts by replacing or providing substitute resources or environments.

Monitoring - The process of collecting information to evaluate if objectives and anticipated or assumed results of a management plan are being realized or if implementation is proceeding as planned.

Multi-aged Stand - A forest stand which has more than one distinct age class arising from specific disturbance and regeneration events at various times. These stands normally will have multi-layered structure.

Multi-layered Canopy - Forest stands with two or more distinct tree layers in the canopy; also called multi-storied stands.

Multiple Use - Management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people. The use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife, fish, and natural scenic, scientific and historical values.

Neotropical migrants - a wide variety of bird species, which breed in temperate North America but migrate to tropical habitats in Central and South America during winter.

Noncommercial Forest Land - Land incapable of yielding at least 20 cubic feet of wood per acre per year of commercial species; or land which is capable of producing only noncommercial tree species.

Noncommercial Tree Species - Minor conifer and hardwood species whose yields are not reflected in the commercial conifer forest land ASQ. Some species may be managed and sold under a suitable woodland ASQ and, therefore, may be commercial as a woodland species.

Nonforest Land - Land developed for nontimber uses or land incapable of being ten percent stocked with forest trees.

Noxious Plant - A plant specified by law as being especially undesirable, troublesome, and difficult to control.

O&C Lands - Public lands granted to the Oregon and California Railroad Company and subsequently revested to the United States.

Off Highway Vehicle (OHV) - Any motorized vehicle capable of, or designed for, travel on land, water, or natural terrain. The term “Off Highway Vehicle” will be used in place of the term “Off Road Vehicle” to comply with the Purposes of Executive Orders 11644 and 11989. The definition for both terms is the same.

Old-Growth Conifer Stand - Older forests occurring on western hemlock, mixed conifer, or mixed evergreen sites which differ significantly from younger forests in structure, ecological function, and species composition. Old growth characteristics begin to appear in unmanaged forests at

175-250 years of age. These characteristics include (a) a patchy, multi-layered canopy with trees of several age classes; (b) the presence of large living trees; (c) the presence of larger standing dead trees (snags) and down woody debris, and (d) the presence of species and functional processes which are representative of the potential natural community.

For purposes of inventory, old-growth stands on BLM-administered lands are only identified if they are at least ten percent stocked with trees of 200 years or older and are ten acres or more in size. For purposes of habitat or biological diversity, the BLM uses the appropriate minimum and average definitions provided by Pacific Northwest Experiment Station publications 447 and GTR-285. This definition is summarized from the 1986 interim definitions of the Old-Growth Definitions Task Group.

Old-Growth Forest - A forest stand usually at least 180-220 years old with moderate high canopy closure; a multilayered, multispecies canopy dominated by large overstory trees; high incidence of large trees, some with broken tops and other indications of old and decaying wood (decadence); numerous large snags; and heavy accumulations of wood, including large logs on the ground.

Old-Growth-Dependent Species - An animal species so adapted that it exists primarily in old growth forests or is dependent on certain attributes provided in older forests.

Operations Inventory Unit - An aggregation of trees occupying an area that is sufficiently uniform in composition, age, arrangement and condition to be distinguishable from vegetation on adjoining areas.

Optimal Cover - For elk, cover used to hide from predators and avoid disturbances, including man. It consists of a forest stand with four layers and an overstory canopy which can intercept and hold a substantial amount of snow, yet has dispersed, small openings. It is generally achieved when the dominant trees average 21 inches DBH or greater and have 70 percent or greater crown closure.

Overstory - That portion of trees which form the uppermost layer in a forest stand which consists of more than one distinct layer (canopy).

Partial Cutting - Removal of selected trees from a forest stand.

Peak Flow - The highest amount of stream or river flow occurring in a year or from a single storm event.

Perennial Stream - A stream that has running water on a year-round basis under normal climatic conditions.

Planning Area - All of the lands within the BLM management boundary addressed in a BLM resource management plan; however, BLM planning decisions apply only to BLM-administered lands and mineral estate.

Plant Association - A plant community type based on land management potential, successional patterns, and species composition.

Plant Community - An association of plants of various species found growing together in different areas with similar site characteristics.

Precommercial Thinning - The practice of removing some of the trees less than merchantable size from a stand so that remaining trees will grow faster.

Prescribed Fire - A fire burning under specified conditions that will accomplish certain planned objectives.

Priority Habitats - Aquatic, wetland and riparian habitats, and habitats of priority animal taxa.

Probable Sale Quantity (PSQ) - Probable sale quantity estimates the allowable harvest levels for the various alternatives that could be maintained without decline over the long term if the schedule of harvests and regeneration were followed. “Allowable” was changed to “probable” to reflect uncertainty in the calculations for some alternatives. Probable sale quantity is otherwise comparable to allowable sale quantity (ASQ). However, probable sale quantity does not reflect a commitment to a specific cut level. Probable sale quantity includes only scheduled or regulated yields and does not include “other wood” or volume of cull and other products that are not normally part of allowable sale quantity calculations.

Proposed Threatened or Endangered Species - Plant or animal species proposed by the U.S. Fish & Wildlife Service or National Marine Fisheries Service to be biologically appropriate for listing as threatened or endangered, and published in the Federal Register. It is not a final designation.

Public Domain Lands - Original holdings of the United States never granted or conveyed to other jurisdictions, or reacquired by exchange for other public domain lands.

Public Water System - A system providing piped water for public consumption. Such a system has at least fifteen service connections or regularly serves at least twenty-five individuals.

Reforestation - The natural or artificial restocking of an area with forest trees; most commonly used in reference to artificial stocking.

Regeneration Harvest - Timber harvest conducted with the partial objective of opening a forest stand to the point where favored tree species will be reestablished.

Resource Management Plan (RMP) - A land use plan prepared by the BLM under current regulations in accordance with the Federal Land Policy and Management Act.

Right-of-Way - A permit or an easement that authorizes the use of public lands for specified purposes, such as pipelines, roads, telephone lines, electric lines, reservoirs, and the lands covered by such an easement or permit.

Riparian Reserves - Designated riparian areas found outside Late-Successional Reserves.

Riparian Zone - Those terrestrial areas where the vegetation complex and microclimate conditions are products of the combined presence and influence of perennial and/or intermittent water, associated high water tables and soils which exhibit some wetness characteristics. Normally used to refer to the zone within which plants grow rooted in the water table of these rivers, streams, lakes, ponds, reservoirs, springs, marshes, seeps, bogs and wet meadows.

Ripping - The process of breaking up or loosening compacted soil to assure better penetration of roots, lower soil density, and increased microbial and invertebrate activity.

Road - A vehicle route which has been improved and maintained by mechanical means to ensure relatively regular and continuous use. A route maintained solely by the passage of vehicles does not constitute a road.

Rotation - The planned number of years between establishment of a forest stand and its regeneration harvest.

Rural Interface Areas - Areas where BLM-administered lands are adjacent to or intermingled with privately owned lands zoned for 1 to 20-acre lots or that already have residential development.

Sanitation-Salvage Cuttings - Combination of sanitation and salvage cuttings. In sanitation cuts trees either killer or injured by fire, insects, disease, etc., are removed for the purpose of preventing the spread of insect or disease. Salvage cut remove trees that are either filled or severely injured before merchantable material becomes unmerchantable.

Scarification - Mechanical removal of competing vegetation or interfering debris prior to planting.

Seral Stages - The series of relatively transitory plant communities that develop during ecological succession from bare ground to the climax stage.
There are five stages:

Early Seral Stage - The period from disturbance to the time when crowns close and conifers or hardwoods dominate the site. Under the current forest management regime, the duration is approximately 0 to 10 years. This stage may be dominated by grasses and forbs or by sprouting brush or hardwoods. Conifers develop slowly at first and gradually replace grasses, forbs, or brush as the dominant vegetation. Forage may be present; hiding or thermal cover may not be present except in rapidly sprouting brush communities.

Mid-Seal Stage - The mid-seral stage occurs from crown closure to the time when conifers would begin to die from competition; approximately age 10 to 40. Stands are dense and dominated by conifers, hardwoods, or dense brush. Grass, forbs, and herbaceous vegetation decrease. Hiding cover for big game is usually present.

Late Seral Stage - Late seral stage occurs when conifers would begin to die from competition to the time when stand growth slows; approximately age 40 to 80. Forest stands are dominated by conifers or hardwoods; canopy closure often approaches 100 percent. Stand diversity is minimal; conifer mortality rates and snag formation are rapid. Big game hiding and thermal cover is present. Forage and understory vegetation is minimal except in understocked stands or in meadow inclusions.

Mature Seral Stage - This stage exists from the point where stand growth slows to the time when the forest develops structural diversity; approximately age 80 to 200. Conifer and hardwood growth gradually decline. Developmental change slows. Larger trees increase significantly in size. Stand diversity gradually increases. Big game hiding cover, thermal cover, and some forage are present. With slowing growth, insect damage increases and stand breakup may begin on drier sites. Understory development is significant in response to openings in the canopy created by disease, insects, and windthrow. Vertical diversity increases. Larger snags are formed.

Old Growth - This stage constitutes the potential plant community capable of existing on a site given the frequency of natural disturbance events. For forest communities, this stage exists from approximately age 200 until when stand replacement occurs and secondary succession begins again. (Also see definitions of old-growth conifer stand and potential natural community.)

These definitions are used by BLM to separate age classes for analysis of impacts.

Short-Term - The period of time during which the RMP will be implemented; assumed to be ten years.

Silvicultural Prescription - A professional plan for controlling the establishment, composition, constitution and growth of forests.

Silvicultural System - A planned sequence of treatments over the entire life of a forest stand needed to meet management objectives.

Site Class - A measure of an area's relative capacity for producing timber or other vegetation.

Site Index - A measure of forest productivity expressed as the height of the tallest trees in a stand at an index age.

Site Preparation - Any action taken in conjunction with a reforestation effort (natural or artificial) to create an environment which is favorable for survival of suitable trees during the first growing season. This environment can be

created by altering ground cover, soil or microsite conditions, using biological, mechanical, or manual clearing, prescribed burns, herbicides or a combination of methods.

Skid Trail - A pathway created by dragging logs to a landing (gathering point).

Slash - The branches, bark, tops, cull logs, and broken or uprooted trees left on the ground after logging.

Smoke Management - Conducting a prescribed fire under suitable fuel moisture and meteorological conditions with firing techniques that keep smoke impact on the environment within designated limits.

Smoke Management Program - A program designed to ensure that smoke impacts on air quality from agricultural or forestry burning operations are minimized; that impacts do not exceed, or significantly contribute to, violations of air quality standards or visibility protection guidelines; and that necessary open burning can be accomplished to achieve land management goals.

Smoke Sensitive Area - An area identified by the Oregon Smoke Management Plan that may be negatively affected by smoke but is not classified as a designated area.

Snag - Any standing dead, partially-dead, or defective (cull) tree at least ten inches in diameter at breast height (DBH) and at least six feet tall. A hard snag is composed primarily of sound wood, generally merchantable. A soft snag is composed primarily of wood in advanced stages of decay and deterioration, generally not merchantable.

Snag Dependent Species - Birds and animals dependent on snags for nesting, roosting, or foraging habitat.

Soil Compaction - An increase in bulk density (weight per unit volume) and a decrease in soil porosity resulting from applied loads, vibration, or pressure.

Soil Displacement - The removal and horizontal movement of soil from one place to another by mechanical forces such as a blade.

Soil Productivity - Capacity or suitability of a soil for establishment and growth of a specified crop or plant species, primarily through nutrient availability.

Special Forest Products - Firewood, shake bolts, mushrooms, ferns, floral greens, berries, mosses, bark, grasses etc., that could be harvested in accordance with the objectives and guidelines in the proposed resource management plan.

Special Status Species - Plant or animal species falling in any of the following categories (see separate glossary definitions for each):
- Threatened or Endangered Species
- Proposed Threatened or Endangered Species
- Candidate Species
- State Listed Species
- Bureau Sensitive Species
- Bureau Assessment Species

Species Diversity - The number, different kinds, and relative abundance of species.

Stand (Tree Stand) - An aggregation of trees occupying a specific area and sufficiently uniform in composition, age, arrangement, and condition so that it is distinguishable from the forest in adjoining areas.

Stand Density - An expression of the number and size of trees on a forest site. May be expressed in terms of numbers of trees per acre, basal area, stand density index, or relative density index.

Stand-replacement Wildfire - A wildfire that kills nearly 100 percent of the stand.

State Listed Species - Plant or animal species listed by the State of Oregon as threatened or endangered pursuant to ORS 496.004, ORS 498.026, or ORS 564.040.

Stream Class - A system of stream classification established in the Oregon Forest Practices Act. Class I streams are those which are significant for: 1) domestic use, 2) angling, 3) water dependent recreation, and 4) spawning, rearing or migration of anadromous or game fish. All other streams are Class II. Class II special protection streams (Class II SP) are Class II streams which have a significant summertime cooling influence on downstream Class I waters which are at or near a temperature at which production of anadromous or game fish is limited. Revised Forest Practices Act may have a new system within a year.

Stream Order - A hydrologic system of stream classification based on stream branching. Each small unbranched tributary is a first order stream. Two first order streams join to make a second order stream. Two second order streams join to form a third order stream and so forth.

Stream Reach - An individual first order stream or a segment of another stream that has beginning and ending points at a stream confluence. Reach end points are normally designated where a tributary confluence changes the channel character or order. Although reaches identified by BLM are variable in length, they normally have a range of ½ to 1-1/2 miles in length unless channel character, confluence distribution, or management considerations require variance.

Structural Diversity - Variety in a forest stand that results from layering or tiering of the canopy and the die-back, death and ultimate decay of trees. In aquatic habitats, the presence of a variety of structural features such as logs and boulders that create a variety of habitat.

Succession - A series of dynamic changes by which one group of organisms succeeds another through stages leading to potential natural community or climax. An example is the development of series of plant communities (called seral stages) following a major disturbance.

Suitable Woodland - Forest land occupied by minor conifer and hardwood species not considered in the commercial forest land ASQ determination and referred to as noncommercial species. These species may be considered commercial for fuelwood, etc. under woodland management. Also included are low site and nonsuitable commercial forest land. These lands must be biologically and environmentally capable of supporting a sustained yield of forest products.

Surface Erosion - The detachment and transport of soil particles by wind, water, or gravity. Surface erosion can occur as the loss of soil in a uniform layer (sheet erosion), in many rills, or by dry ravel.

Thermal Cover - Cover used by animals to lessen the effects of weather. For elk, a stand of conifer trees which are 40 feet or more tall with an average crown closure of 70 percent or more. For deer, cover may include saplings, shrubs or trees at least five feet tall with 75 percent crown closure.

Threatened Species - Any species defined through the Endangered Species Act as likely to become endangered within the foreseeable future throughout all or a significant portion of its range and published in the Federal Register.

Timber Production Capability Classification (TPCC) - The process of partitioning forestland into major classes indicating relative suitability to produce timber on a sustained yield basis.

Transportation System - Network of roads used to manage BLM-administered lands. Includes BLM controlled roads and some privately controlled roads. Does not include Oregon Department of Transportation, county and municipal roads.

Understory - That portion of trees or other woody vegetation which form the lower layer in a forest stand which consists of more than one distinct layer (canopy).

Viable Population - A wildlife or plant population that contains an adequate number of reproductive individuals to appropriately ensure the long-term existence of the species.

Viewshed - The landscape that can be directly seen from a viewpoint or along a transportation corridor.

Visual Resources - The visible physical features of a landscape.

Visual Resource Management (VRM) - The inventory and planning actions to identify visual values and establish objectives for managing those values and the management actions to achieve visual management objectives.

Water Quality - The chemical, physical, and biological characteristics of water.

Water Yield - The quantity of water derived from a unit area of watershed.

Wetlands or Wetland Habitat - Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include, but are not limited to, swamps, marshes, bogs, and similar areas.

Wet Meadows - Areas where grasses predominate. Normally waterlogged within a few inches of the ground surface.

Wildlife Tree - A live tree retained to become future snag habitat.

Withdrawal - A designation which restricts or closes public lands from the operation of land or mineral disposal laws.

Woodland - Forest land producing trees not typically used as saw timber products and not included in calculation of the commercial forest land ASQ.