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2004

Juncrock Timber Sale

Final Environmental Impact Statement

Mt. Hood National Forest
Barlow Ranger District

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Changes between Draft and Final

Minor corrections, explanations, and edits are not included in this list.

- Language in the Purpose and Need has been clarified.
- Purpose and Need for Road Construction has been expanded.

JUNCROCK TIMBER SALE
Environmental Impact Statement
Introduction

A. Location

The Juncrock Planning Area is located within the boundaries of the Barlow Ranger District of the Mt. Hood National Forest. It is located along State Highway 216 to the south and extends north to the boundary of the White River Wild and Scenic Area. The White River Wild and Scenic Area, including the White River Late Successional Reserve (LSR), is adjacent to Juncrock.

The Juncrock Planning Area encompasses about one third of the McCubbins Gulch Off Highway Vehicle (OHV) Recreation Area. Clear Creek Campground, located along Forest Development Road (FDR) 2130, is adjacent to the planning area. See Juncrock Planning Area Map 2.

B. Management Direction

This analysis is tiered to the Final Environmental Impact Statement for both the Mt. Hood Land and Resource Management Plan and the Northwest Forest Plan.

Mt. Hood Forest Land and Resource Management Plan:

The Mt. Hood National Forest Land and Resource Management Plan, as amended, (MHFP) contains direction for management of the Juncrock planning area. Land Allocations include Scenic Viewsheds (B2), approximately 17% of the area, and Timber Emphasis (C1), about 83% of the area. See Map 3, in the Map Appendix. Included within both B2 and C1 allocations are areas designated General Riparian Area (B-7), which are not mapped.

The goals for Timber Emphasis management areas are to provide lumber, wood fiber, and other forest products based on the capability and suitability of the land (Standards and Guides, [S&G's] pages Four-289 thru Four-294). Regulated timber harvest is a planned output. The goals of Scenic Viewsheds are to provide attractive, visually appealing forest scenery, utilizing vegetation management activities to create and maintain long-term desired landscape characteristics through time and space (S&G's, pages Four-218 thru Four 228). The goals for General Riparian Areas are to achieve and maintain riparian and aquatic habitat conditions for the sustained, long-term production of fish, selected wildlife and plant species, and high quality water. A secondary goal is to maintain a healthy forest condition through a variety of timber management practices (S&G's, pages Four – 253 through Four – 260.). Juncrock is adjacent to the White River Late Successional Reserve (LSR). Table A-1, "Relevant Forest Plan Management Direction", located in Appendix O, displays additional Forest Plan direction.

Northwest Forest Plan:

The Northwest Forest Plan (NWFP), which amended the Forest Plan, provides standards and guides associated with Matrix lands, Aquatic Conservation Strategy (ACS), Riparian Reserves, and Key Watersheds in the Juncrock planning area (NWFP, Appendix B6, Aquatic Conservation Survey, pages B-81 thru B-129). Map 4 of the Map Appendix, displays the land designations for this area. Table A-2 "Relevant NWFP Riparian Management Direction" located in Appendix O

of this document, displays additional Northwest Forest Plan direction. Streams, ditches, and riparian reserves are identified on Map 5.

The Juncrock Planning area is located within the White River 5th Field watershed and the Beaver Creek 5th field watershed. Of the approximately 3,865 acres in the planning area, 3,625 acres are within the White River Watershed and 240 acres are within the Beaver Creek Watershed. The White River Watershed is located on the Mt. Hood National Forest, while the majority of the Beaver Creek watershed is located on the Confederated Tribes of The Warm Springs Indian Reservation (CTWS).

The NWFP identified the White River Watershed as a Tier 2 Key Watershed, important for high quality water, but does not contain at-risk fish stocks. Timber harvest and other silvicultural activities may be conducted on matrix lands with suitable forestlands. Green tree retention (GTR), dead tree retention, and coarse woody debris are emphasized (ROD pp. C-39 thru C-42).

The Beaver Creek Watershed is identified as a non-key watershed under the NWFP, although there are threatened Middle Columbia River Evolutionary Significant Unit (ESU) steelhead. There are no riparian reserves located in the planning area that flow into the Beaver Creek Watershed.

The species management recommendations outlined in the Final Supplemental Environmental Impact Statement For Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (November 2000) and it's Record of Decision and Standards and Guidelines dated January 12, 2001 (called the S&M FSEIS in the remainder of this document) were followed.

The White River Watershed Analysis (WRWA) was completed in August of 1995. This document is a systematic process to characterize the aquatic, riparian, and terrestrial features within a watershed. Information gathered during watershed analysis can be used to adjust riparian reserve widths, identify opportunities to achieve land management objectives, identify watershed restoration opportunities, and develop monitoring programs.

Recommendations of the WRWA, which would apply to the Juncrock area include:

- Maintain an owl corridor (WRWA, page 6-6 and 6-9).
- Maintain and develop additional mature forest structure types (WRWA, page 6-5 & 6).
- Minimize fragmentation of mature forest stands (WRWA, page 6-6).
- Manage riparian reserves to bring vegetation within the range of historic condition, (WRWA, page 6-4 and 6-6) and meet ACS objectives.

White River Late Successional Reserve Assessment

The White River Late Successional Reserve Assessment, completed in March of 1996, is an assessment of the LSR and the 100 acres LSR's within the White River area. The assessment provides information and a site-specific description of current management direction, as well as recommendations for future management, following the Mt. Hood Forest Plan, as amended.

The LSR identified the Juncrock planning area as having fragmented northern spotted owl nesting, roosting and foraging habitat (NRF), and dispersal habitat. This NRF habitat can be maintained in at least marginal condition through selective thinning, while conditions improve at the more moist elevations where NRF habitat would naturally occur (White River Late Successional Reserve Assessment, page IV-43).

A recommendation of the LSR Assessment, which would apply to the Juncrock area, is to maintain the identified Interior Habitat corridor (White River Late Successional Reserve Assessment, page V-9, Junction Landscape Unit).

C. Landscape Background

The Juncrock Planning area transitions from a moist hemlock forest, to a drier grand fir forest. Trees that grow in the planning area include western hemlock, Douglas-fir, and true fir trees. There are scattered western red cedar, western larch, and ponderosa pine. Western hemlock is the dominant mature and regenerating tree in the western hemlock series stands, while Douglas-fir and grand fir dominate the overstory and regeneration in the grand fir stands. Understories are dense, containing dwarf Oregon grape, creeping snowberry or vine maple.

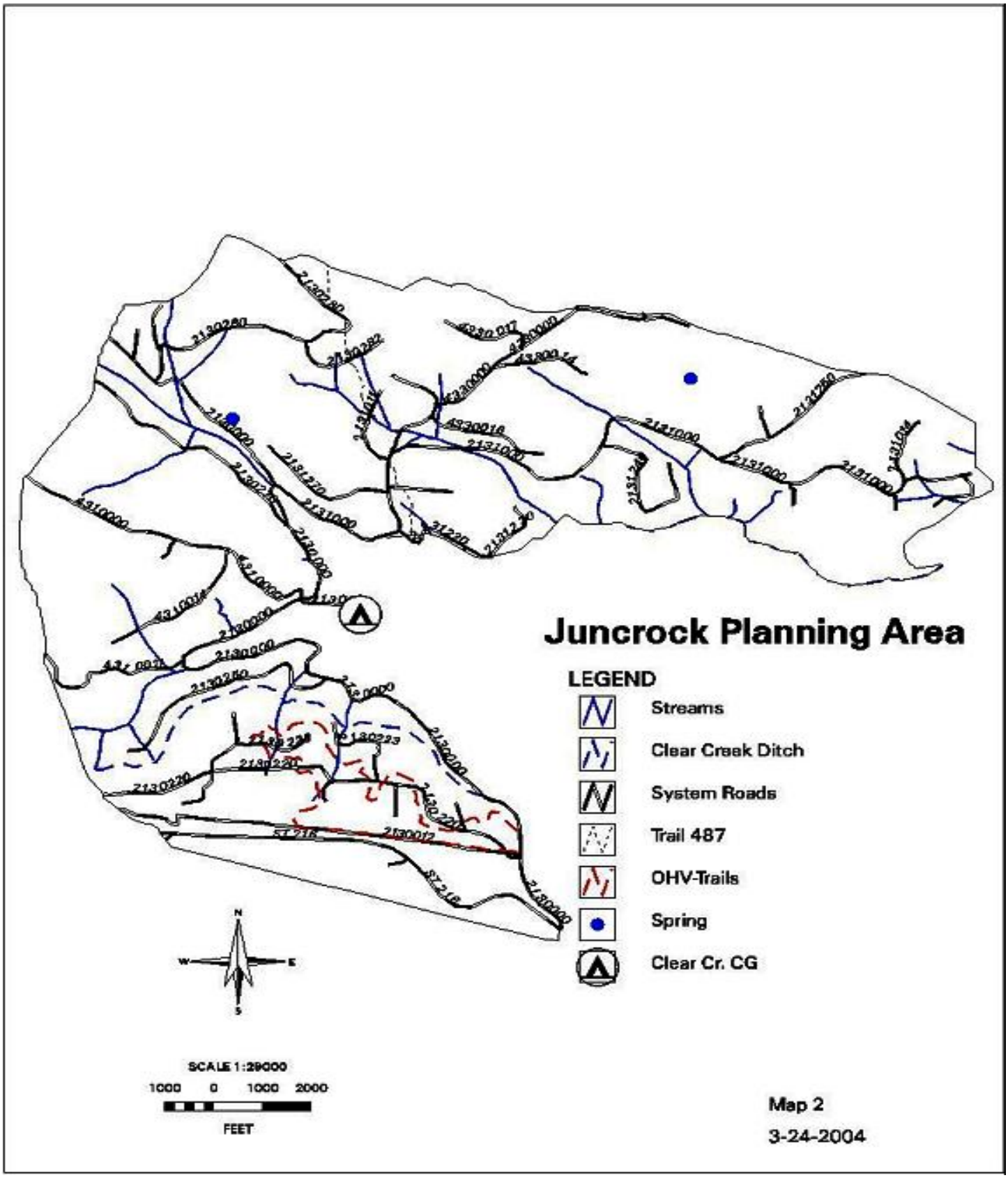
Two stem decays, (Indian paint fungus and red ring rot), a butt rot disease, (brown cubical butt rot), bark beetles, and mistletoe exist through out this area. Hosts for the Indian paint fungus are true fir and western hemlock, where decay is most serious in older, larger trees. Red ring rot and brown cubical butt rot are common in Douglas-firs and larch, where the diseases infect older, larger trees. Mistletoe can be found on Douglas-fir, larch, ponderosa pine, and true firs.

Many stands in the planning area have a high stem density per acre. High stem density lowers the stands ability to grow healthy, vigorous trees with a large, well shaped, deep green crowns. Weak trees with small, misshapen, off color crowns, and spindly boles are more susceptible to insects' and disease.

For planning purposes, the initial area considered contained about 3,865 acres. The team that preformed the analysis (Chapter IV) visited each forest stand on the ground to determine its present condition. Each stand was analyzed to determine which structures (crown ratios, crown color, tree density, horizontal and vertical tree placement in the stand) and functions (nesting roosting forage, owl corridor, hiding, thermal cover) it was meeting. A stand was considered fully functional if it met designated needs such as canopy cover, individual tree structure, percent canopy gaps, or stand complexity and would continue to do so for 20 to 30 years. Approximately 1211 acres (31%) are meeting current needs at this time.

After further consideration, an additional 1999 acres were eliminated from study when it was determined these acres did not require treatment or were not of a commercial size.

The remaining 655 acres then became the focus of the proposed action. A stand was considered not fully functional if it did not contribute to the desired future condition, or through deterioration, would fail to meet it within the next 20 to 30 years. Approximately 105 of these acres, even though they are in need of treatment, are designated for Green Tree Retention (GTR's) or buffer areas for Survey and Manage species in the proposed action.


Juncrock Planning Area
LEGEND
Streams
Clear Creek Ditch
System Roads
Trail 487
OHV-Trails
Spring
Clear Cr. CG
N
W
E
S
SCALE 1:29000
1000 0 1000 2000
FEET
Map 2
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Chapter I
The Purpose of and Need for Action

Objectives for proposing a timber harvest in the Juncrock planning area include:

1. Provide commercial wood products, which contribute to the Probable Sale Quantity (PSQ) of the Northwest Forest Plan.
2. Improve timber stand conditions by reducing stand density and reducing the number of trees damaged by insects and disease.
3. Promote Douglas-fir, ponderosa pine, and western larch trees species that are shade intolerant, fire tolerant, and more resistant to insect and disease.
4. Maintain a connectivity corridor for the Northern Spotted Owl between the White River LSR and other LSR's.
5. Shift road densities towards the Desired Future Condition (DFC) of 2.5 miles/mile^2.
6. Improve safety by removing leaning, unhealthy trees along Oregon State Highway 216.

1.0 Proposed Action

The Barlow Ranger District proposes to treat forest vegetation on approximately 550 acres of the 3,865 acres in the planning area, using five treatments. The proposed action would also construct and close roads in the same area. To meet the above objectives, the proposed action would:

1. Remove individual trees on 331acres that keep stands from achieving the following desired stand characteristics: trees of the desired sizes or species, trees free of disease or mistletoe, or trees within the desired spacing.
2. Thin approximately 219 acres on which trees have died, are dying, or are competing with desirable sizes and species of trees. Treatment of these 550 acres would recover wood fiber.
3. Treat approximately 14 acres of riparian reserves.
4. Designate approximately 105 acres of Green Tree Retention (GTR) and Habitat Protection Areas.
5. Regenerate approximately 163 acres after treatment. Created openings would range from 1 to 30 acres in size.
6. Plant created openings with shade intolerant trees that are less susceptible to diseases.
7. Construct 0.80 miles of road and reconstruct approximately 2.0 miles of road.
8. Close roads for approximately 10.2 miles to move the area towards open road density standards for wildlife.

1.1 Purpose of Vegetative Forest Stand Treatment

The purpose of the Juncrock vegetation management project is to help meet the goal of timber production on C-1 lands (MHFP page Four-288) and provide a scheduled timber harvest contributing to the probable sale quantity (PSQ) (NWFP, page C-39) while reducing insect and disease caused losses to the value and volume of trees harvested. These objectives would be met by manipulating existing stand characteristics to reduce stand density, reduce the number of trees damaged by insects and disease, and promote desired tree species, which would create a viable stand structure for the next 20 to 30 years.

The Need for Vegetative Forest Stand Treatment Thinning Stands 70 to 90 Years Old

Existing Condition: The areas shown on Map 6 in the map appendix in light blue, have an over story of Douglas-fir, Western Hemlock and grand fir, with diameters of 8 to 20 inches and a canopy cover of 50 to 80 %. Remnant trees are few and scattered. The second layer is sparse, made up of western hemlock and grand fir, with diameters of 5 to 10 inches and a canopy cover of 0 to 30 %. The ground layer is very sparse, consisting of scattered vine maple shrubs and suppressed western hemlock or grand fir saplings with a diameter of less than 4 inches. These stands have very high stem densities. There are 122 acres (3% of the planning area) in this condition.

Photo 1: Thinning Stands 70 to 90 Years Old. Representative picture of stand condition.

Need for Action: The major cause of declining stand health is competition due to density. High tree densities result in poor crown development, poor diameter growth, and a low resistance to, and high incidence of, insects and disease. The Douglas-fir is beginning to self thin, while the hemlock is showing signs of Indian Paint Fungus. Over the next twenty years, fuel loading would become extreme. There is a need for reducing densities to promote the growth of healthy, desirable species, while meeting other resource objectives.

Proposed Action: Of the 122 acres considered for treatment, 98 acres would be treated. Approximately 6 of the 98 acres are riparian reserves that would be treated. An additional 20 acres of GTR areas and/or protected habitat are associated with these 98 acres. Trees would be thinned in all layers to increase crown vigor, reduce frequency of disease, and increase the proportion of disease resistant species in the stand. Canopy cover would be kept high with healthy trees to prevent windthrow and reduce the density of true fir and western hemlock.

Thinning Stands 90 to 250 Years Old

Existing Condition: This is a single layered stand, shown in peach on Map 6, with few mid layer trees and a very sparse ground layer. The overstory trees are Douglas-fir, ponderosa pine, and grand fir, with diameters from 20 to 48 inches, and a canopy cover between 50 to 80%. Western larch and western white pine can be found scattered through out the stand. The sparse mid layer is made up of Douglas-fir and grand fir, with 4 to 18 inch diameters and canopy covers of 0 to 30%. When there is a ground layer, it is made up of suppressed Douglas-fir, western hemlock and grand fir less than 4 inches in diameter, with a canopy cover of 0 to 10%. There are approximately 416 acres (11%) in this condition.

Photo 2: Thinning Stands 90 to 250 Years Old---Representative picture of stand condition

Need for Action: The major causes of declining health are insects, stem decays, competition in the upper and mid layers, and sun and wind exposure effects adjacent to large openings. There is a need for reducing stand densities, while maintaining canopy cover, to promote the growth of healthy, desirable species. Higher canopy covers help reduce the tattering effects of the wind adjacent to existing openings.

Proposed Action: Maintain the existing mature characteristics on 121 acres by removing trees competing with larger, older, overstory trees, and removing trees infested with insects or disease. Large Douglas-fir and ponderosa pine would be favored as leave trees. Approximately 10% of the area would be in small group openings, which would be planted. An additional 29 acres of GTR areas and protected habitat are associated with these 121 acres.

Individual Tree Selection, resulting in 10% of the treated area in Regeneration Openings:
Existing Condition: These are two and three-layered stands, shown in purple on Map 6. The overstory trees are Douglas-fir, western hemlock and grand fir, 18 to 40 inches in diameter, with canopy cover of 20 to 30%. Scattered ponderosa pine, western larch, and western white pine are present in this layer. The mid layer consists of Douglas-fir, western hemlock and grand fir, with diameters between 6 to 16 inches, and a canopy cover of 15 to 30%. The under story consists of small Douglas-fir, western hemlock and grand fir, and western larch, less than 6 inches in diameter and 20 to 30% canopy cover. There is a significant shrub layer of vine maple. Approximately 313 acres (8%) are in this condition.

Photo 3: Individual Tree Selection, 10% regeneration: Representative picture of stand condition.

Need for Action: The major causes of decline in this stand are diseases in the overstory and competition due to high density in all layers. Mistletoe from the overstory deforms and kills preferred tree species in the understory. There is a need for removing trees with mistletoe from the overstory to protect the long-term health of preferred tree species in the understory. There is a need for lowering stand densities by removing competing trees to promote the growth of healthy, desirable species with existing mature characteristics. There is a need for removing unhealthy trees that lean towards Highway 216.

Proposed Action: Maintain the open multistory characteristics while reducing stand density in all layers on 89 acres. Approximately 8 of the 89 acres are Riparian Reserve acres that would be treated. Trees competing with the overstory canopy trees would be removed. Trees with a high likelihood of infecting the understory, or competing with more disease resistant or desirable species, would be removed. Douglas-fir, western larch, and ponderosa pine would be favored. Canopy gaps would be minimized. A large tree character would be emphasized. Approximately 25 acres would be maintained as GTR areas and protected habitat. About 10% (9 acres) of the treated area may be in small group openings, one to two acres in size, which would be planted. Unhealthy trees that lean towards Highway 216 would be removed.

Individual Tree Selection, resulting in 25% of the treated area in Regeneration Openings
Existing Condition: These are variable one, two and three layered stands shown in dark blue on Map 6. The overstory trees are Douglas-fir, western hemlock and grand fir, 20 to 48 inches in diameter, with canopy covers between 5 and 50%, going as high as 80%. Some stands have more Ponderosa pine than others. Scattered western larch, western white pine can be found. The mid layer consists of Douglas-fir, western hemlock and grand fir, with western red cedar in the riparian areas. Diameters range between 4 and 18 inches, with the majority of trees 6 to 16 inches in diameter, and a canopy cover of 5 to 60%. The under story is made up of suppressed Douglas-fir, western hemlock and grand fir, less than 6 inches in diameter and with 0 to 20% canopy cover. Structure variability is due to the susceptibility of the true firs and hemlocks to disease. Approximately 601 acres (16%) of this condition are proposed for treatment.

Photo 4: Individual Tree Selection, 25% regeneration: Representative picture of stand condition.

Need for Action: The major cause of decline is competition due to high density, stem decay, mistletoe, and insects. Canopy gaps are forming in the overstory, allowing disease susceptible species to regenerate in the understory. There is a need for removing competing, diseased trees to enhance stand characteristics and maintain canopy cover in the overstory. There is a need for promoting disease resistant species in the understory.

Proposed Action: Remove excess unhealthy trees, while preserving the healthy trees in all layers, to reduce densities, increase crown vigor, and increase the disease resistance of the stand on 80 acres. Approximately 25% (20 acres) of openings, 1 to 10 acres in size, would be planted with a variety of disease resistant species. An additional 11 acres would be maintained as GTR areas and protected habitat.

Individual Tree Selection resulting in 75% of the treated area in Regeneration Openings
Existing condition: This treatment comes from the same 601 acres of the previous treatment. These stands are a separate stratification because they exhibit more insect and disease problems.

Photo 5: Individual Tree Selection, 75% regeneration: Representative picture of stand condition.

Need for Action: The general health of these stands is poor. Stands are collapsing due to species composition, disease, mortality and past selective harvest. Stem disease and mistletoe are at epidemic levels. Existing overstory canopy cover is less than 50% and may drop to 20% or less within 10-20 years. The understory is dense and stagnating. There is a need for retaining disease resistant trees and maintaining canopy cover, and to maintain stand characteristics and canopy cover where possible. There is a need for replacing disease susceptible understory trees with more disease resistant species, to promote the growth of healthy, desirable species.

Proposed Action: Remove trees on 162 acres that exhibit signs of disease, or other problems that would interfere with re-establishment of a healthy, disease resistant stand. Approximately 122 acres of openings, 1 to 30 acres in size, would be planted with a variety of disease resistant species. The advanced understory would be thinned, showing preference to disease resistant trees. Treatment includes approximately 9 acres of riparian reserve. An additional 21 acres of GTR areas and protected habitat are associated with this treatment type.

TABLE 1-1 PROPOSED ACTION SUMMARY		
Treatments	**Acres**	**Regeneration Openings**
Thin Stands 70 to 90 years old	98 Acres	No regeneration
Thin Stands 90 to 250 years old	121 Acres	May include up to 10% of the area in 1 to 2 acre regeneration openings.
Individual Tree Selection resulting in 10% of the area in regeneration openings	89 Acres	May include up to 10% of the area in 1 to 2 acre regeneration openings.
Individual Tree Selection resulting in 25% of the area in regeneration openings	80 Acres	May include up to 25% of the area in 1 to 10 acre regeneration openings.
Individual Tree Selection resulting in 75% of the area in regeneration openings	162 Acres	May include up to 75% of the area in 1 to 30 acre regeneration openings.

1.2 Purpose of Transportation System Management

The purpose of the Juncrock transportation system management is to provide access for management activities, reduce road densities to lower wildlife harassment, reduce sediment input into streams, remove unhealthy leaning trees from major highways, and protect roads from damage during critical wet periods. A major characteristic of Timber Emphasis lands (C-1), where most of the existing road system is located, is motor vehicle access available to most areas (MHFP C-1, page Four 290).

The NWFP identified nine Aquatic Conservation Strategy (ACS) objectives that focus on the "maintain and restore" portion of the existing conditions or implement actions to restore road conditions. Four of the nine objectives are important to road management objectives.

- Maintain and restore drainage network connectivity within watersheds. (ROD, Page B-11. Objective #2)
- Maintain and restore the physical integrity of stream bottom configurations. (ROD, Page B-11. Objective #3)
- Maintain and restore water quality. (ROD, Page B-11. Objective #4)
- Maintain and restore the sediment regime. (ROD, Page B-11. Objective #5)

Road Closures

Existing Condition: The planning area is divided into two road analysis areas. See Map 7 in the map appendix. In the northern portion, open road density is 4.45 miles/mile^2. The southern portion includes the McCubbins Gulch Off Highway Vehicle (OHV) Area. The effective open system road and motorized trail density is 8.38 miles/mile^2. The average road density for the entire area is 5.13 miles/mile^2.

Need for Action: There is a need for reducing the miles of road per square mile to come closer to the Forest Plan standard and guides of 2.5 miles/mile^2.

Proposed Action: Approximately 1.49 miles of road would be closed in the OHV portion of the planning area. See Table A-3, for Roads Proposed for Closure, OHV Area.

The proposed action would close approximately 8.71 miles of road in the northern portion of Juncrock. See Table A-4, Roads Proposed for Closure, non-OHV Area, in Appendix O.

Road Construction
Existing Condition: Unit 19 lies on both sides of Oregon Highway 216. There is no access to the north 1/2 of this unit. The nearest road to Unit 4 is 1/4 mile away. There is no access into Unit 15. FDR 2130226 ends at the upper corner of Unit 16.

Need for action: There is a need for access into Unit 19 without putting a landing adjacent to the highway. There is a need for access into Unit 4 for long term management of this area. There is a need for access into Units 15 & 16 for harvest management. This temporary road would be needed for post harvest work as well.

Proposed action: Extend existing system road from Unit 18 into Unit 19. Extend FDR 4330018 into Unit 4, and extend FDR 2130226 through Unit 16 to Unit 15.

Table 1-2 - Summary of Roads Information	
Road Closures	10.2 miles
Road Reconstruction	. 2.0 miles
New Road Construction	0.80 miles

1.3 Issues Around the Proposed Action:
Summary of Public Scoping

Scoping was initiated in the fall of 1998. The Juncrock Planning Area has been identified in Sprouts, the Mt. Hood National Forest quarterly publication that lists upcoming actions, from the summer of 1998 through the winter of 2002. There have been two field trips with interested public groups out to the planning area. One field trip was with Greg Dyson of BARK, on July 10, 2001. Another field trip was with Brad Nye of the Confederated Tribes of the Warm Springs Indian Reservation in 2001.

A public meeting was held on June 28, 1997, in Zigzag, Oregon, at a project fair for the Zigzag Ranger District. The scoping letter for the Proposed Action was sent to approximately 10 agencies and 50 interested people. Comments have been received from approximately 225 interested individuals and two user groups and two federal agencys`, in the form of letters and cards. The cards are the same, although some individuals made additional comments. Two phone calls about this project were received.

Two frequent comments received were to consider a No Old Growth Alternative and to consider a Restoration Only Alternative using non-commercial methods. Both of these comments are addressed in Chapter II. Names of those who were contacted during the scoping phase and those who responded can be found in the appendix.

Issues
The public raised issues and concerns during the scoping process. Issues and concerns were divided into three categories:

1. Those outside the scope of this EIS.
2. Those addressed through the design of the proposed action.
3. Issues which are an unresolved conflict concerning the proposed action.

These are discussed below.

Issues outside the scope of this EIS:

Issue: Harvesting trees and building roads would impact essential and critical habitat for anadromous fish.
Response: There is no essential critical habitat for anadromous fish inside the planning area. The Juncrock Planning Area is located in the White River watershed. Twelve miles below the forest boundary is White River Falls, a 180-foot falls which bars upstream passage of fish. Salmon and steelhead are not found in the area above White River Falls. Essential fish habitat and critical habitat for anadromous fish ends at White River Falls. There are no fish bearing streams within the Juncrock portion of the Beaver Creek Watershed, see Map 14 for the location of the watersheds.

Issue: Building new roads will degrade roadless areas.
Response: There are no Inventoried Roadless Areas within the Juncrock planning area. The entire planning area is roaded. Map 2 shows the planning area and road locations.

Issue: Recreation opportunities are limited in this area. Consider converting closed roads to trails.
Response: Closed roads are available for foot travel. The purpose of the proposed action is to address vegetation management and road system management.

Issue: Harvesting timber and building roads may have impacts on the White River Wild and Scenic River corridor.
Response: The Juncrock planning area lies completely outside of the White River Wild and Scenic River corridor as identified in White River Wild and Scenic River Plan (1993). See Map 9 for the location of the White River Wild and Scenic Area.

Issue: Grazing has a detrimental effect on riparian areas and native fish habitat.
Response: The Juncrock proposal is designed to address vegetation and road system management. Grazing management is not a part of this proposal.

Issues Addressed through the Design of the Proposed Action

Issue: Cutting and harvesting of trees may degrade the riparian area by removing potential woody debris, and would not meet forest plan objectives of maintaining and enhancing riparian areas.
Response: Design features of the proposed action include marking and leaving additional trees for future large woody debris in Unit 14. Four trees per acre would be left as wildlife trees, which would provide future down wood material.

Issue: There are areas within the Juncrock Planning Area with the potential for landslides. Timber harvest or road building can increase the potential for landslides.
Response: There is one area susceptible to landslides within the planning area. Areas proposed for treatment are outside the area with a potential for landslides.

Issue: Cutting trees and building roads may destroy habitat of Survey and Manage Species.
Response: The current required management recommendations are incorporated into all treatment areas and alternatives. Protection Areas would remain undisturbed. In addition, approximately one third of the planning area is left untreated at this time.

Issue: Wildlife trees left along Oregon Highway 216 or along the power line right of way may contribute a safety hazard to the public.
Response: Trees that are leaning or unhealthy adjacent to Oregon Highway 216 or the power line would not be designated as wildlife trees.

Issue: Soil compaction causes changes in the surface and subsurface water flow, disrupting hydrologic flow and resulting in changes to flora and fauna.
Response: The proposed action has been designed to meet Forest Plan Standards and Guides of not exceeding detrimental impacts to soil on 15% of the project activity area. These standards and guides would protect flora and fauna.

Issue: Cutting trees will continue to fragment the area, causing loss of interior habitat for shade dependent plant and animal species.
Response: The proposed action would remove some interior habitat. Sufficient interior habitat would remain for these shade dependent plant and animal species.

Issue: Logging can spread Indian Paint Fungus and Brown Cubical Rot.
Response: Logging can contribute to the spread of brown cubical rot, and Indian paint fungus. In general, the diseases are spread by wind blown spores that germinate on wounds and branch stubs of host trees. Brown cubical rot is also spread along the roots in older trees and can persist in the roots of dead trees. The recommended treatment is to remove infected trees and maintain vigorous stands of less susceptible tree species.

Issue: Harvesting in the CHU may degrade or down grade Nesting Roosting and Foraging (NRF) Habitat of the Northern Spotted Owl Critical Habitat Unit (CHU OR2).
Response: Harvesting in the CHU would degrade and/or down grade NRF habitat. Consultation with US Fish and Wildlife Service was completed and a biological opinion was issued. See Wildlife BE in Appendix C. See Map 10 for the location of the CHU.

Issues that are Unresolved Conflicts Concerning the Proposed Action

Issue: Road reconstruction and harvesting in the area near Trail # 487A would replace parts of the trail with a road. Harvesting and road construction would affect the visual setting of the trail and could affect the recreational experience along the trail for those that use the trail.

Issue: Road construction can impact habitat for flora and fauna. The proposed action would construct system and non system roads. This could lead to soil compaction of currently uncompacted ground. Extending roads increases the miles of road available for use. Increased road use would increase harassment to wildlife, especially during the spring and fall. Use of roads during wet conditions could add sediment to streams.

Issue: Cutting large diameter trees would cause a loss of biological diversity and social values associated with old growth forests. Units 8 and 2, and other areas planned for harvest have trees larger than 21 inches in diameter designated for removal. Harvesting large diameter trees removes wildlife habitat. In an area with many young plantations, harvesting large trees creates a loss of biological diversity. Large trees add scenic value and diversity to the area. There is a loss of social values when large trees are removed.

These issues were used to formulate alternatives and/or mitigation measures for the action alternatives. How the alternatives respond to these significant issues is shown in Table 2-10.

Juncrock Timber Sale
Final Environmental Impact Statement

Introduction

Chapter II

Changes between Draft and Final

Minor corrections, explanations, and edits are not included in this list.

- Riparian reserve treatments and areas have been clarified.
- Summary Tables have been expanded.
- BMPs have been identified.
- A monitoring section has been added.

Chapter II
Alternatives Including the Proposed Action

This chapter describes the alternatives considered to achieve the purpose and need discussed in Chapter 1. Three action alternatives: Alternative II, the Proposed Action, Alternative III, the Even Aged Approach, and Alternative IV, the Uneven aged Approach with Large Tree Retention, were developed. Alternative I, the No Action Alternative, is described and evaluated. How each alternative responds to the Purpose and Need and Significant Issues are summarized in the Comparison Tables 2-9 and 2-10.

2.0 Alternatives Considered and Eliminated From Further Study

Restoration Only Alternative:

An alternative proposed by the public was a Restoration Only Alternative, with no commercial timber harvest. The recommendation was to do the silvicultural treatments, but not remove the wood commercially. The question of how this work was to be financed and accomplished was not addressed in the proposal. To design such an alternative, money would have to come from restoration funds rather than from timber appropriated funds. This proposal did not meet the purpose of providing a predictable and sustainable output of timber as directed in the Forest Plan and the Northwest Forest Plan.

Helicopter Logging:

An alternative, also proposed by the public, was to helicopter log rather than use the proposed ground based system. The ground in the proposed units is relatively flat, with the steepest slopes approaching 15%. An existing road system that accesses most units is in place and would remain in place. Proposed temporary roads are low impact roads over flat ground and would be low cost and low impact. These roads can be effectively closed after use and would not become part of the Forest Service road system. There is no need to design an aerial system as roads are in place. Ground based logging systems are designed to meet Standards and Guides.

Given current market conditions, the volume and value of timber to be harvested lends itself to a ground based system. Costs for logging using a ground based system average $60.00 per thousand board feet, while the cost of helicopter logging averages $360.00 per thousand board feet. At this cost, helicopter logging would not be feasible.

Underburning as a Stand Treatment

One response from the public suggested a controlled burn in Units 10 and 12 would improve forest health. Juncrock is located in an area that ranges from moist hemlock to drier grand fir zones. The trees in these zones are susceptible to fire damage, based on tree species and natural fuels build-ups. A controlled burn would be harmful to residual trees. This treatment in an alternative would not contribute to wood fiber production or meet stated objectives.

2.1 ALTERNATIVES

This section describes in detail the no action, proposed action, and the alternatives to the proposed action. Best Management Practices (BMP's) and Design features common to all action alternatives are listed at the end of the description of the alternatives, on pages 31-33. See Table 2-6 for a comparison of Silvicultural Prescriptions.

2.1.1 Alternative I No Action Alternative

Under this alternative, the proposed action would not occur. Stands would continue to be crowded, increasing risk from insects and disease. Loss of wood fiber values would continue. No lumber or wood fiber would be produced. No roads would be closed under this alternative. Roads currently closed with guardrails would likely continue to be breached.

Activities such as hunting, driving for pleasure, and woodcutting, would continue. Management activities such as road maintenance, noxious weed control and fire suppression would also continue. Habitat areas for protected species or heritage resource sites would remain undisturbed from harvest activities. Current management plans would continue to guide management of the project area.

2.1.2 Alternative II - Proposed Action: Uneven Aged Management Approach

Alternative II is a collaborative approach to meet conflicting silvicultural and owl dispersal corridor objectives. The general silvicultural theme is to phase in uneven age management rather than the Forest Plan recommended evenage silvicultural system. The proposed uneven age system improves stand structure and quality, increasing the vigor and value of leave trees. This uneven aged system does not refer to the mechanical removal of trees that have attained a certain diameter. The proposed system is flexible. The best possible use is made of each stand. Regeneration areas occur where stand health dictates. Regeneration is more reliable and the remaining canopy can be nearly continuous throughout the stand, both vertically and horizontally. Areas that can hold high single layer canopy cover would be maintained.

This alternative is designed to meet the Purpose and Need using thinning and individual tree selection to reduce the number of competing, suppressed, highly disease susceptible or dying trees, regardless of tree diameter. Green trees in direct competition of more desirable tree species would be harvested. The stem density in individual stands would be variable. Grand fir and western hemlock trees remain in the stands, but in a lower proportion. This alternative allows the remaining leave trees to expand crowns and increase vigor, leaving stands with a higher percentage of tree species that are shade intolerant, fire tolerant, and more resistant to insect and disease.

This alternative focuses on recommendations from the White River Watershed analysis, which include:

1) Maintain an owl connectivity corridor by maintaining and developing additional mature forest structure types, and minimizing fragmentation of mature forest stands.
2) Manage riparian reserves to bring vegetation within the range of historic condition and meet ACS objectives.

Alternative II would treat 550 acres using a ground based system and include the following harvest treatments:

- Thin 98 acres of 70 to 90 year old, overstocked stands to a 40 to 70 % canopy closure. The post harvest basal area would range from 80 to 180 sq. ft. Ponderosa pine, larch and Douglas-fir would be the preferred leave species. Up to 6 acres of riparian reserves would be treated with this prescription.

- Thin 121 acres of 90 to 250 year old, overstocked stands to a 40 to 70% canopy closure. The post harvest basal area would range from 80 to 240 sq. ft. Approximately 12 acres would require replanting with Douglas-fir, ponderosa pine, and larch. No riparian reserve would be treated with this prescription.

- On 89 acres, use individual tree selection to create a stand with variable densities and canopy closure varying between 30 and 60%. The post harvest basal area would vary, ranging from 20 to 220 sq. ft. The preferred leave trees would be Douglas-fir, ponderosa pine and some larch. Up to 9 acres (10%) would need to be replanted. Up to 8 acres of riparian reserve would be treated with this prescription.

- On 80 acres, use individual tree selection to create a stand with variable densities and canopy closures varying between 40 and 50%. The post harvest basal area would vary, ranging from 20 to 250 sq. ft. The preferred leave trees would be Douglas-fir, ponderosa pine and larch. Western hemlock would be represented in the stand. Up to 20 acres (25%) would need to be replanted. No riparian reserve would be treated with this prescription.

- On 162 acres, use individual tree selection to create a stand with variable densities and canopy closure varying between 40 and 50%. The post harvest basal area would vary, ranging from 20 to 200 sq. ft. The preferred leave trees would be Douglas-fir, ponderosa pine and larch. Approximately 122 acres (75% of the stand) would need to be replanted. No acres of riparian reserve would be entered with this prescription.

- Of the total 550 acres treated, approximately 14 acres would be in riparian reserves. The same prescription for the uplands would be carried into the riparian reserves in Units 15R, 18R, and 21R. Units 1R, 2R, 13R and 14R would have an Individual Tree Selection (10% regeneration) harvest. Unit 14R would have additional trees left for Large Woody Debris (LWD).

Slash would be grapple piled and the piles burned in all units.

Reforestation would be by natural regeneration or by planting shade intolerant, fire tolerant species such as Douglas-fir, ponderosa pine and western larch.

Approximately 0.80 miles of road would be constructed and closed after harvest. These are roads where there is no indication of wheel tracks on the ground.

Table 2-1 Road Construction

FDR #.	Access into Unit	Miles	Type of Road	Type of Closure
FDR 4330018	4	0.45	System	Berm
FDR 2130227	18 & 19	0.1	System	Berm
Temporary Road off FDR 2130226	15 & 16	0.25	Temporary	Berm, (after post harvest work)
	Total miles	0.80		

Approximately 2.0 miles of road would be reconstructed. These are wheel tracks that exist on the ground, but are not tracked in the Forest Service road system and are not maintained.

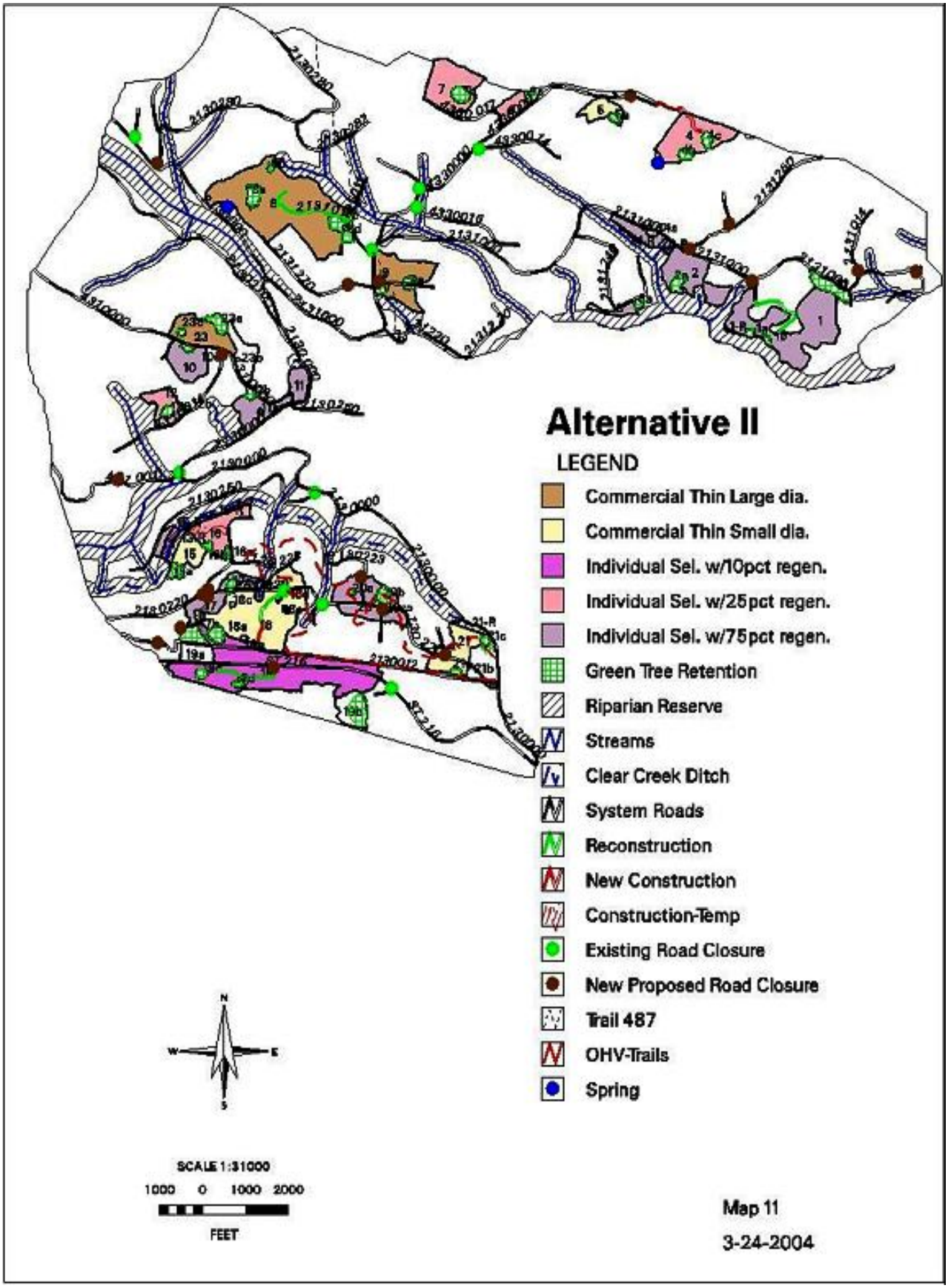
Reconstructing these roads for use during harvest activities would enable the Forest Service to close them after use.

Table 2-2 Road Reconstruction

FDR #.	Access into Unit	Miles	Type of Road	Type of Closure
FDR 2100019	19	0.3	System	Berm
FDR 2131013 (Extension of existing road)	1	0.3	System	
FDR 2131013	1	0.5	Existing System	Berm
FDR 2131011 (Extension of existing road)	8	0.4	System	
FDR 2131011	8	0.3	Existing System	Berm (retain tread for trail)
FDR 2130227	18	0.2	System	Berm
	Total miles	2.0		

Approximately 10.2 miles of roads would be closed to move road densities towards Forest Plan S&G's. Tables A-3 and A-4 in the Appendix list roads proposed for closure.

Alternative II is displayed on Map 11. A larger copy of Map 11 can be found in the Appendix Map Packet.


Alternative II
LEGEND
Commercial Thin Large dia.
Commercial Thin Small dia.
Individual Sel. w/10pct regen.
Individual Sel. w/25pct regen.
Individual Sel. w/75pct regen.
Green Tree Retention
Riparian Reserve
Streams
Clear Creek Ditch
System Roads
Reconstruction
New Construction
Construction-Temp
Existing Road Closure
New Proposed Road Closure
Trail 487
OHV-Trails
Spring
N
W
E
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SCALE 1:31000
1000 0 1000 2000
FEET
Map 11
3-24-2004

2.1.3 Alternative III Evenaged Management Approach

This alternative maintains the existing management by a progression of evenage harvest blocks. It is considered the simplest silvicultural system and lends itself to proven silvicultural practices. Stands that have reached culmination would be regenerated using a shelterwood reforestation system. Other stands would be commercially thinned with a partial cut. The only exception, Unit 19, would be managed with an unevenaged system emphasizing large trees to met visual concerns along Highway 216.

This alternative would focus on emphasizing existing stand conditions and timber production. Shelterwoods and overstory removals would eliminate disease by removing the majority of trees from the stand and replanting with less susceptible and more resilient species. This alternative is based on the Forest Plan Standards and Guides for C1-Timber Emphasis land and follows the silvicultural management recommendations for the existing disease conditions.

This alternative would treat 550 acres using a ground based system and include the following harvest treatments:

- Thin 98 acres of 70 to 90 year old overstocked stands to a 40 - 70% canopy closure. The post harvest basal area would vary between 80 to 180 sq. ft. Douglas-fir, ponderosa pine, and larch, would be the preferred leave species. Up to 6 acres of riparian reserves would be treated with this prescription.

- Thin 57 acres of 90 to 250 year old overstocked stands to a 40% to 70% canopy closure. The post harvest basal area would vary from 80 to 240 sq. ft. Douglas-fir, ponderosa pine, and larch would be the preferred leave species. No riparian areas would be entered

- On 90 acres, use individual tree selection to create a stand with variable densities and canopy closure averaging between 30 and 60 %. The post harvest basal area would vary, ranging between 20 and 220 sq. ft. The preferred leave trees would be Douglas-fir, ponderosa pine and larch. Up to 9 acres (10%) would need to be replanted. Up to 8 acres of riparian reserve would be treated with this prescription.

- On 305 acres, create shelterwoods, leaving an average of 18 trees per acre, four of which would be wildlife trees. The preferred leave trees would be the largest or healthiest Douglas-fir, ponderosa pine or larch. The entire 305 acres would require regeneration. No acres of riparian reserve would be treated with this prescription.

- Of the total 550 acres treated, approximately 14 acres would be in riparian areas. The same prescription for the up lands would be carried into the riparian areas in Units 15R, 18R, and 21R. Units 1R, 2R, 13R and 14R would have an Individual Tree Selection (10% regeneration) harvest. Unit 14R would have additional trees left for Large Woody Debris (LWD).

Reforestation would be by natural regeneration or by planting Douglas-fir, ponderosa pine, and western larch.

Approximately 0.8 miles of road would be constructed and closed after harvest. These are roads where there is no indication of wheel tracks on the ground.

Table 2-3 Road Construction

FDR #.	Access into Unit	Miles	Type of Road	Type of Closure
FDR 4330018	4	0.45	System	Berm
FDR 2130227	18 & 19	0.1	System	Berm
Temporary Road off FDR 2130226	15 & 16	0.25	Temporary	Berm, (after post harvest work)
	Total miles	0.80		

Approximately 2.0 miles of road would be reconstructed. These are wheel tracks that exist on the ground, but are not tracked in the Forest Service road system and are not maintained.

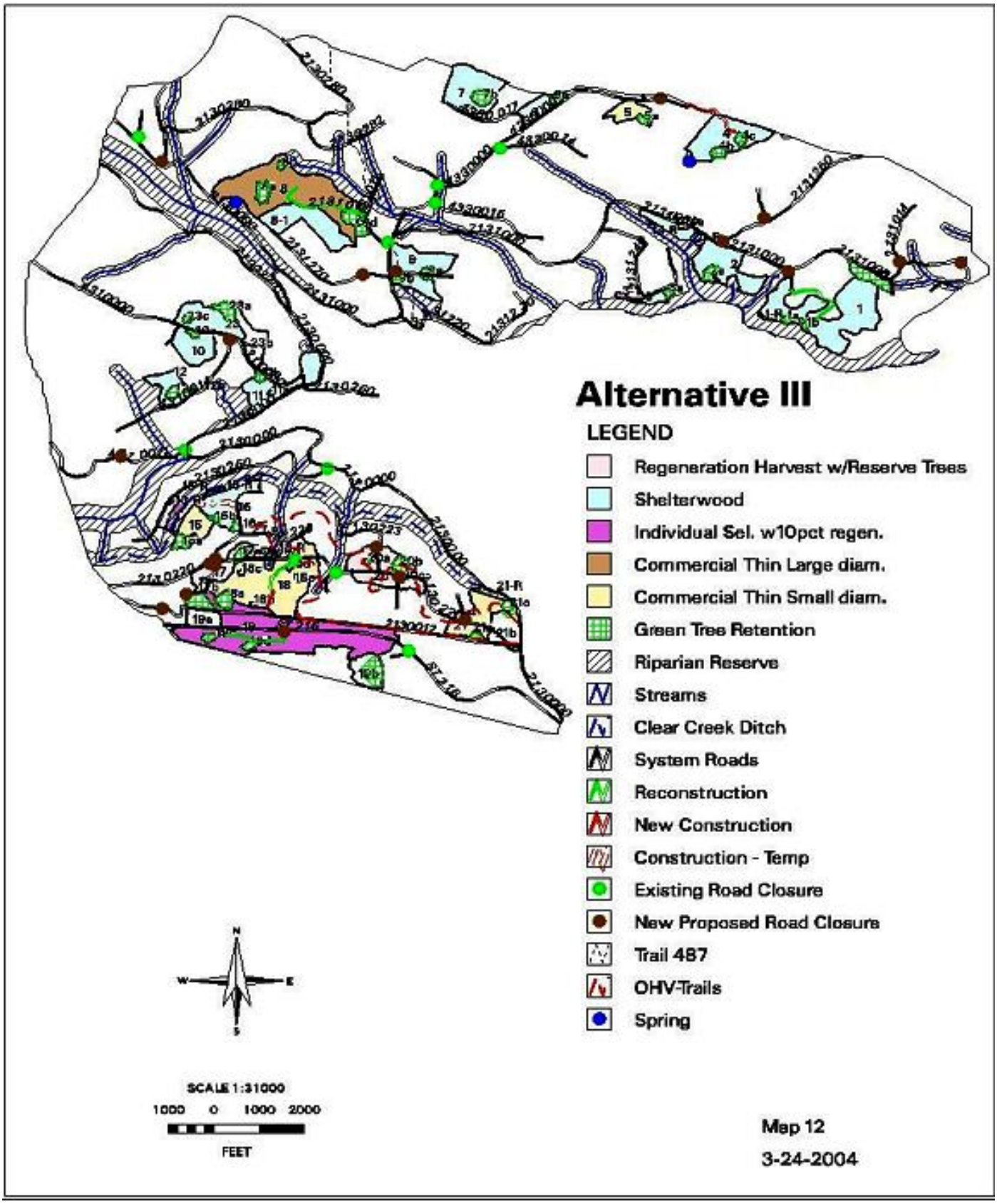
Reconstructing these roads for use during harvest activities would enable the Forest Service to close them after use.

Table 2-4 Road Reconstruction

FDR #.	Access into Unit	Miles	Type of Road	Type of Closure
FDR 2100019	19	0.3	System	Berm
FDR 2131013 (Extensions of existing Road)	1	0.3	System	
FDR 2131013	1	0.5	Existing System	Berm
FDR 2131011 (Extensions of existing Road)	8	0.4	System	
FDR 2131011	8	0.3	Existing System	Berm (retain tread for trail)
FDR 2130220	18	0.2		
	Total miles	2.0		

Approximately 10.2 miles of roads would be closed to move road densities towards Forest Plan S&G's. Tables A-3 and A-4 in Appendix O, list roads proposed for closure.

Alternative III is displayed on Map 12. A larger copy of Map 12 can be found in the Appendix Map Packet.


Alternative III
LEGEND
Regeneration Harvest w/Reserve Trees
Shelterwood
Individual Sel. w10pct regen.
Commercial Thin Large diam.
Commercial Thin Small diam.
Green Tree Retention
Riparian Reserve
Streams
Clear Creek Ditch
System Roads
Reconstruction
New Construction
Construction - Temp
Existing Road Closure
New Proposed Road Closure
Trail 487
OHV-Trails
Spring
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Map 12
3-24-2004

2.1.4 Alternative IV Uneven Aged Management Approach, With Large Tree Retention. This alternative responds to the issue of large tree retention generated by the public. Alternative IV appears similar to Alternative II. However, placing a diameter limit of 21 inches DBH changes the post harvest conditions.

This alternative uses thinning and uneven age individual trees selection to remove competing, suppressed, or dying trees under 21 inches diameter at breast height (DBH). Stand densities would be higher, with a BA averaging 173. Gaps would be formed around big trees by removing trees less than 21 inches DBH that compete with the larger trees. Trees over 21 inches located in skid trails, on landings or identified as leaning over roads would be removed.

An alternate road would enter Unit 8 on FDR 2131220, leaving Trail #487A intact. Longer skid distances would be the rule, rather than building new roads or extending existing ones.

Alternative IV would log 513 acres using a ground-based system. Units 4 and 15, a total of 37 acres, would be logged using a **helicopter.**

- Thin 98 acres of 70 to 90 year old, overstocked stands to a canopy closure between 40 to 70%. The post harvest basal area would range between 80 to 180 sq. ft. Douglas-fir, ponderosa pine, and larch would be the preferred leave species. Up to 6 acres of riparian reserves would be treated with this prescription.

- Thin 121 acres of 90 to 250 year old, overstocked stands, to a 40 to 70% canopy closure. The post harvest basal area would range from 80 to 240 sq. ft. Approximately 12 acres would require regeneration, with Douglas-fir, ponderosa pine, and larch the preferred species. No riparian reserves would be treated with this perscription.

- On 145 acres, use individual tree selection to create a stand with variable densities and a canopy closure varying between 35 and 65%. The post harvest basal area would vary, ranging from 20 to 250 sq. ft. Trees 21 inches DBH and larger would not be harvested. Exceptions would be trees located near landings, in skid trails, or identified as leaning over roads. The preferred leave trees would be Douglas-fir, ponderosa pine or larch. Up to 15 acres (10%) would need to be replanted. Up to 8 acres of riparian reserves would be treated with this prescription.

- On 169 acres, use individual tree selection to create a stand with variable densities and canopy closure varying between 45 and 55%. The post harvest basal area would vary, ranging from 20 to 220 sq. ft. Trees 21 inched DBH and larger would not be harvested. Exceptions would be trees located near landings, in skid trails, or leaning over roads. The preferred leave trees would be Douglas-fir, ponderosa pine and larch. Western hemlock would be represented in the stand. Up to 42 acres (25%) would be replanted. No riparian reserves would be treated with this prescription.

- On 17 acres, Use individual tree selection to create a stand with variable densities and canopy closures between 40 and 50%. Trees 21 inched DBH and larger would not be harvested. Exceptions would be trees located near landings, in skid trails, or identified as

leaning over roads. The preferred leave trees would be Douglas-fir, ponderosa pine and larch. Approximately 13 acres (75% of the stand) would be replanted. No riparian reserves would be treated with this prescription.

- Of the total 550 acres treated, approximately 14 acres would be in riparian areas. The same prescription for the up lands would be carried into the riparian areas in Units 15R, 18R, and 21R. Units 1R, 2R, 13R and 14R would have an Individual Tree Selection (10% regeneration) harvest. Unit 14R would have additional trees left for Large Woody Debris (LWD)

Slash would be grapple piled, and the piles burned in all units.

No roads would be constructed. Long skids would replace road construction.

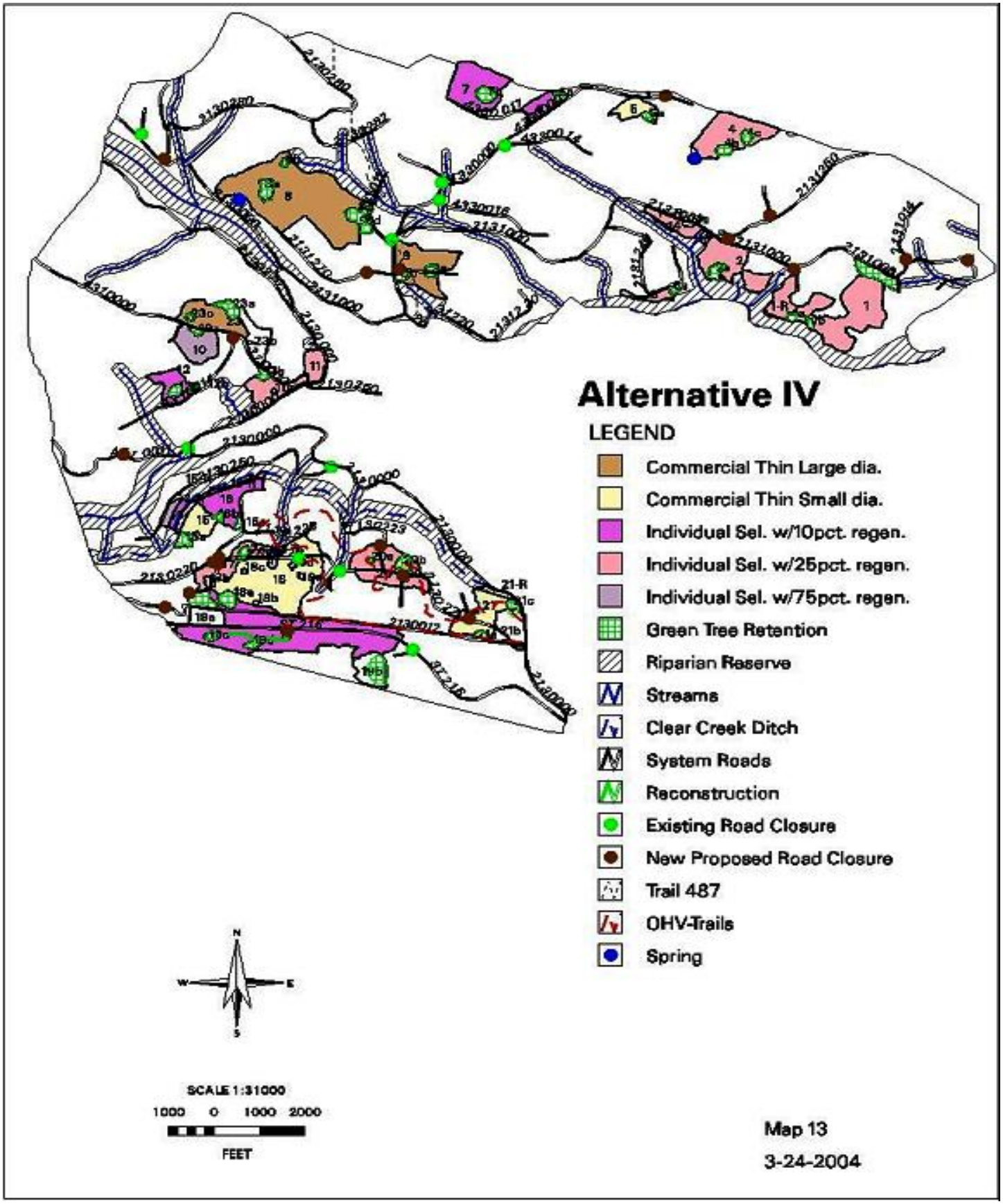
Access into Unit 19 would require the reconstruction of 0.3 miles of road.

Table 2-5 Road Reconstruction

FDR #.	Access into Unit	Miles	Type of Road	Type of Closure
FDR 2100019	19	0.3	System	Berm
	Total miles	0.3		

Approximately 10.2 miles of roads would be closed to move road densities towards Forest Plan S&G's. Tables A-3 and A-4 in appendix O, list roads proposed for closure.

Alternative IV is displayed on Map 13. A larger copy of Map 13 can be found in the Appendix Map Packet.


Alternative IV
LEGEND
Commercial Thin Large dia.
Commercial Thin Small dia.
Individual Sel. w/10pct. regen.
Individual Sel. w/25pct. regen.
Individual Sel. w/75pct. regen.
Green Tree Retention
Riparian Reserve
Streams
Clear Creek Ditch
System Roads
Reconstruction
Existing Road Closure
New Proposed Road Closure
Trail 487
OHV-Trails
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Map 13
3-24-2004

The following table summarizes silvicultural prescriptions in the Action Alternatives.

Table 2-6 Silvicultural Prescription Summary						
Silviculture Prescription	Alternative 2		Alternative 3		Alternative 4	
	Treatment Acres	*Regeneration Acres	Treatment Acres	*Regeneration Acres	Treatment Acres	*Regeneration Acres
Thinning stands 70 to 90 years old	98	0.0	98	0.0	98	0.0
Thinning stands 90 to 250 years old	121	12	57	0.0	121	12
Individual Tree Selection with 10% of the area needing regeneration	89	9	90	9	145	15
Individual Tree Selection with 25% of the area needing regeneration	80	20	0.0	0.0	169	42
Individual Tree Selection with 75% of the area needing regeneration	162	122	0.0	0.0	17	13
Shelterwood with100% regeneration	0.0	0.0	305	305	0.0	0.0
Total Acres Treated	550	163	550	302	550	82
Total MMBF	9 MMBF**		16 MMBF		5.7 MMBF	

*The amount of acres requiring regeneration is only an estimate. The amount may vary in each unit and between treatment types
**MMBF – Million Board Feet

The following table summarizes units by silvicultural prescriptions in the Action Alternatives.

Table 2-7 Units by Silvicultural Prescription						
Silviculture Prescription	**Alternative 2**		**Alternative 3**		**Alternative 4**	
	Treatment Acres	**Unit Numbers**	**Treatment Acres**	**Unit Numbers**	**Treatment Acres**	**Unit Numbers**
Thinning stands 70 to 90 years old	98	5, 15, 15R, 18, 18R, 21, 21R	98	5, 15, 15R, 18, 18R, 21, 21R	98	5, 15, 15R, 18, 18R, 21, 21R
Thinning stands 90 to 250 years old	121	8, 9, 23	57	8	121	8, 9, 23
Individual Tree Selection, with 10% of the area needing regeneration	89	1R, 2R, 13R, 14R, 16R, 19	90	1R, 2R, 13R, 14R, 16R, 3-1, 19	145	1R, 2R, 13R, 14R, 6, 7, 12, 16, 16R 19
Individual Tree Selection with 25% of the area needing regeneration	80	4, 6, 7, 12, 16	0.0	0.0	169	1, 2, 3, 4, 11, 14, 17, 20
Individual Tree Selection with 75% of the area needing regeneration	162	1, 2, 3, 10, 11, 13, 14, 17, 20	0.0	0.0	17	10, 13
Shelterwood with 100% regeneration	0.0	0.0	305	1, 2, 3, 4, 6, 7, 8-1, 9, 10, 11, 12, 13, 14, 16, 17, 20, 23	0.0	0.0
Total Acres Treated	550		550		550	

2.2 Comparison Tables for All Alternatives:

The following tables are a summary comparison between alternatives as they relate to the Purpose and Need and Significant Issues identified in Chapter I.

Table 2-8 Transportation System Summary			
Road Treatments	Alternative II	Alternative III	Alternative IV
	Miles	Miles	Miles
Roads Closed	10.2	10.2	10.2
Roads Constructed*	0.80	0.80	0.0 (Long skids, rather than extending roads)
Road Reconstruction*	2.0	2.0	0.3 (Long skids, rather than temp. roads)

*Includes system and temporary roads

Table 2-9 How Alternatives Respond to Objectives					
Objectives		**Alternative I**	**Alternative II**	**Alternative III**	**Alternative IV**
Objective # 1: Provide lumber and wood fiber		0 MMBF*	9 MMBF	16 MMBF	6 MMBF
Objective # 2: Acres of overstocking, insects & disease reduced		0 acres	550 acres	550 acres	550 acres
	Desired BA: 80-120 sq. ft.	246 sq. ft. BA per acre existing	125 sq. ft. BA acre post harvest	58 sq. ft BA per acre post harvest	143 sq. ft BA per acre post harvest
Objective # 3: Acres regenerated with Douglas fir, Ponderosa pine & western larch.		0 acres	163 acres	302 acres	82 acres
	Average BA % of shade intolerant trees in stands	69%	83%	86%	82%
Objective # 4: Maintain Connectivity Corridor		Would remain intact	Would remain intact	Would not be breached, but would be reduced in effectiveness	Would remain intact
Objective # 5: Shift Road Densities over all towards DFC		5.13 mile/mile^2	3.46 mile/mile^2	3.46 mile/mile^2	3.46 mile/mile^2
	McCubbins Gulch OHV trail area	8.38 mile/mile^2	7.57 mile/mile^2	7.57 mile/mile^2	7.57 mile/mile^2
	Area Ouside of OHV area	4.45 mile/mile^2	2.6 mile/mile^2	2.6 mile/mile^2	2.6 mile/mile^2
Objective # 6: Leaning & Unhealthy trees removed		No	Yes	Yes	Yes

*MMBF – Million Board Feet

Table 2-10 How Alternatives Respond to Significant Issues				
Significant Issues	**Alternative I**	**Alternative II**	**Alternative III**	**Alternative IV**
Temporarily relocate Trail	No	Yes	Yes	No
Miles of road constructed	0.0	0.8	0.8	0.0
Miles of road reconstructed	0.0	2.0	2.0	0.3
Cut trees larger than 21”	No	Yes	Yes	No*

*Except for trees located in sikd trails, leaning over roads, or near landings

2.3 BMPs and Design Features Common to all Action Alternatives:

Sections 208 and 319 or the Clean Water Act of 1972, as amended (1977 and 1987) acknowledge land treatment measures as being an effective means of controlling nonpoint sources of water pollution and emphasizes their development. These land treatment practices are known as Best Management Practices, (BMP's). BMP's are identified in the Forest Plan as a practice or combination of practices that are the most effective and practical (including technological, economic and institutional considerations) means of preventing or reducing the amount of pollution generated by non-point sources to a level compatible with water quality goals.

BMP's are applied as a system of practices rather than a single practice. They are designed to accommodate site specific conditions and are incorporated into the design features. Site-specific design features include such things as the design of project units, in which boundaries are moved to exclude seeps and spring found during planning. BMP's are identified within the Design Features below:

Harvest Systems

1. Where possible, use existing skid trails. (BMP)
2. All paint marking that would be visible from Oregon Highway 216, Rd. 2130 and Trail #471A would face away from the road.
3. Harvest equipment and activities would be excluded from Habitat and GTR Areas. This includes decking, skidding, hauling, parking, or camping.
4. Where possible, landings and temporary roads would not be located within 300 feet of the boundary of Habitat Areas. Proposed landings or temporary roads closer to Habitat Areas would be reviewed by the ID Team and approved by the District Ranger before use.

Riparian Reserves and Clear Creek Irrigation Ditch:

1. Leaving additional trees would increase the structural component to the stream channel and flood prone area. In Unit 14R, leave an estimated 5 to 15 additional trees, (20 to 48 inches DBH). These trees would be girdled and allowed to fall naturally. In Unit 11, the portion of trees that fall across FDR 2130 into the riparian reserve would be cut off and left for riparian reserve enhancement.
2. No equipment would be closer than 50 feet of the centerline of Clear Creek Ditch. (BMP)
3. Hand buck and pile slash within 50 feet of the centerline of the irrigation ditch. (BMP)
4. There would be no skidding across the ditch. (BMP)
5. Tree planting would not occur on the ditch berm.
6. Directionally fall trees away from streams, Clear Creek irrigation ditch, and areas specified as "no cut" areas. (BMP)
7. No skid trails are allowed closer that 50 feet of the ditch unless they are located on existing skid trails or roads. (BMP)

Fuels Treatments:

1. Activity slash would be grapple piled and these piles would be burned to reduce fine fuels. Grapple piles would be located on existing skid roads and trails were possible.

2. Large down woody material would not be piled.
3. Equipment used to grapple pile slash would be confined to existing skid trails where possible (BMP)
4. Hand buck and hand pile slash within 50 feet of the centerline of Clear Creek Ditch, if needed. (BMP)
5. Slash piling would be accomplished around owl seasonal restrictions.

Wildlife Requirements:

1. Leave four dead trees/acre, (minimum 16 inches DBH and 40 feet tall) as wildlife trees. Leave green trees if no dead trees are available.
2. All other snags would be left, except those identified as safety hazards.
3. Leave a minimum of 240 linear feet of down woody material per acre. Preference is for full-length trees.
4. An owl seasonal operating restriction of March 1 through July 15 would apply to Units 1, 8, 10 and 23.

Recreation

1. Use of OHV trails would be restricted during harvest activities.
2. Rimrock Trail #478A would be temporarily rerouted during harvest activities.
3. Keep OHV trails and Rimrock Trail #478A open during harvest activities where practical and safe to do so from Monday through Friday. Trails would be open for use on Saturday and Sunday between April 1 and October 30.
4. Limit the number of skid trails or temporary roads crossing OHV trails or Rimrock Trail #478A.
5. When skid trails must cross a recreational trail, close and obscure the first 100 feet of the skid trail entrance.

Visuals

1. Retain groups of existing young trees in Unit 19 for multistory visual diversity and screening.
2. Flush cut sumps that would be seen from Oregon Highway 216.

Noxious Weeds

1. The purchaser/contractor would be required to certify in writing that all off-road equipment is free of Invasive Plants prior to each start-up of timber sale or road related operations. (BMP)
2. The purchaser/contractor shall employ whatever cleaning methods are necessary to ensure that off road equipment is free of soil, seeds, vegetative matter or other debris that could contain or hold seed prior to coming onto National Forest lands
3. Forest Service will make a determination if a visual inspection is needed and will set the time and place for the inspection.

Vegetation Design Features Specific to Individual Units

Table A-6, in the Appendix, shows design criteria specific to individual units in the action alternatives.

Transportation

1. Restrict commercial haul when soil moisture is high enough for subgrade material to be in its plastic limit (BMP).
2. FDR 2130, at milepost 0.74, Clear Creek Irrigation bridge has a 13' width restriction.
3. Limit log haul to Monday through Friday on FDR's 2130 from 2130250 to Oregon Highway 216. Saturday, Sunday and Holidays log haul would be prohibited.
4. Log haul on Forest Service road 2130 from Clear Creek Campground to the Junction of the 2130250 would be prohibited.
5. The power line road, FDR 2130012 (Units 18, 19 & 21) is closed to skidding and hauling.
6. There is a winter CFR closure to vehicles over 40 inches wide from Dec. 1 to April 1 on FDR's 2130, 4310, and 4330.
7. Long-term road closures would utilize berms or non-movable closure devices.
8. Close and obscure the first 100 feet of all temporary roads and skid trail entrances from open system roads and OHV trails.
9. Where closed roads are crossed by motorcycle trails, scatter slash on both sides of the trail.
10. Time construction activities to minimize erosion. (BMP)
11. Control surface road drainage to disperse runoff and minimize erosion and sediment from the road. (BMP)
12. Use timely erosion control measures on incomplete roads to minimize erosion and sedimentation from disturbed ground. (BMP)

Table A-7, in the Appendix, shows specific design criteria for individual roads and units.

2.4 Monitoring

The Project Specific BMPs and practices listed above are standard operating procedures and they have been implemented in many previous projects. Past experience, research and monitoring indicate that these practices are highly implementable and highly effective based on the criteria found in the Forest Plan Appendix H (p 9)

Once the BMPs are identified and implemented, monitoring is done on a Forest-wide basis to determine the effectiveness of the BMPs. After harvest operations are completed, these BMPs would be included in the pool of Forest wide projects available for monitoring the effectiveness of the BMPs. Monitoring implementation of project specific BMPs is ongoing during project planning, layout and sale administration. Monitoring reports can be found on the Forest's web site at http://www.fs.fed.us/r6/mthood under Forest Publications.

After planning, a cross walk would be prepared to check the provisions of the Timber Sale Contract and other implementation plans with the FEIS to insure that required elements have been accounted for.

During implementation, Timber Sale Administrators monitor compliance with the Timber Sale Contract which contains provisions for resource protection including but not limited to; seasonal restrictions, snag and course woody debris retention, stream protection, erosion prevention, soil protection, road closures and protection of historical sites.

Post harvest reviews would be conducted where needed prior to post harvest activities such as slash treatment, site preparation, tree planting, or firewood removal. Suitable nesting and dispersal habitat or non-habitat and snag and course woody debris retention is reviewed. Level II surveys of perennial fish bearing creeks would continue. Based on these reviews, post harvest activities would be adjusted where needed to achieve project and resource objectives.

Reforestation monitoring would be conducted and if insufficient survival rates are found, replanting would be scheduled. Monitoring of noxious weeds and invasive plants would be conducted where appropriate to track changes in populations over time and corrective action would be prescribed when needed.

Juncrock Timber Sale
Final Environmental Impact Statement

Chapter III

Changes between Draft and Final

Minor corrections, explanations, and edits are not included in this list.

- ✓ Restructured Desired Future Conditions Tables to match text.
- ✓ Included a section on Management of Competing and Unwanted Vegetation.
- ✓ Included Table 3-10, Summary of Botanical Pre-Field and Survey Results.
- ✓ Added Cumulative Effects for Pine Marten and Pileated Woodpeckers.
- ✓ Included discussions of DecAID Analysis to the Direct and Indirect Effects of the Alternatives II, III, and IV on Snag and Down Log Associated Species.
- ✓ Included Table 3-15 with updated write up on stream temperatures.
- ✓ Economic Resources have been updated and separated into its own section.
- ✓ Added a section on research, reports and letters.

Chapter III
Affected Environment and Effects of Alternatives

3.0 Introduction:
The Affected Environment chapter describes the existing environmental resources that would be affected by the alternatives if they were implemented. This description, combined with the description of effects of implementing the Proposed Action or the Action alternatives provides the basis for evaluating the alternatives and their effects on resources.

Cumulative effects analysis includes past, present and reasonably foreseeable future activities. Included are: timber harvest activities, fuels treatment, prescribed burning, road construction and reconstruction, road closures, noxious weed treatment, stream restoration, recreation and OHV use, gathering of forest products, activities on adjacent lands, cattle grazing, transport of water for irrigation, and protection of community infrastructures and resource values.

The spatial area and assumptions made for cumulative effects analysis varies by each resource and is discussed in each section.

3.1 Silviculture
Existing Condition
The Juncrock planning area is part of the transition zone from the western hemlock series to the grand fir series. The planning area south of Frog Creek is occupied by the western hemlock-grand fir/queencup beadlily plant association. North and east of Frog Creek is occupied by the grand fir/vine maple/vanillaleaf plant association. Both series have 50 to 80 inches of rain a year, a winter snow pack, and warm dry summers.

Species Composition
In the grand fir/vine maple/vanillaleaf plant association, Douglas-fir and grand fir dominate the overstory in all stands. Grand fir seedlings regenerate abundantly in most stands. Occasional ponderosa pine shares the canopy with western larch. The composition of the western hemlock-grand fir/queencup beadlily plant association is similar except mature and regenerating western hemlock trees are common. Western red cedar and Pacific yew can be found in wetter environments. Except for young clearcuts, the basal area density of the stands range from slightly exceeding the level where imminent competition mortality occurs to maximum stocking levels where stagnation and high mortality takes place.

Diseases
Two types of stem decays, a butt rot disease, and dwarf mistletoe contributes to timber volume losses throughout the planning area.

The most serious stem decay is brown stringy rot, caused by *Echinodontium tinctorium*, commonly called Indian paint fungus. Indian paint fungus attacks the heartwood. Hosts are true firs and hemlocks. The more true fir and western hemlock in the stand and the older the stand,

the more severe the Indian paint fungus. One large conk indicates approximately 40 feet of rot within the stem. Other indicators of its presence are frost cracks and misshapen branches. The disease is spread by wind-borne spores infecting new hosts through tiny (0.5 mm) dead branch stubs. Suppressed and slow growing trees are likely to be infected because they heal branch stubs slowly. The fungus remains dormant until activated by a wound, frost crack or large branch breaking near the bole. Once activated, it rapidly decays the wood. The majority of western hemlock and grand fir trees in the treatment units are infected with this disease. The volume lost from this disease is estimated at 30% in trees less than 80 years and as high as 100% in trees over 150 years.

A second common stem decay is red ring rot, caused by the fungus *Phellinus (Fomes) pini*. This fungus is most common in older stands, but it also attacks second growth stands. It infects Douglas-fir, western larch, ponderosa pine, western hemlock, and true firs. Indicators are sunken areas on the stem and hoof-shaped to bracket-like perennial conks. Like Indian paint fungus, wind carried spores that germinate on wounds and branch stubs spread red ring rot. In the treatment units, the predominant host tree is ponderosa pine and western larch. Infected trees showing indicators of red ring rot generally have no commercial value.

The third disease is brown cubical butt rot caused by *Phaeolus (Polyporus) schweinitzii*, often called velvet top fungus. This fungus causes extensive butt rot in infected trees. It is common in older Douglas-fir, pine, spruce, and western larch trees, particularly those with fire scars. It is identified by its large mushrooms, occurring on the ground near or growing from the base of the infected trees and is mostly confined to the root system and lower 10 feet of the tree bole. The fungus can persist in roots of dead or cut trees and infect roots of the developing trees. In the treatment units, this disease is common in the over mature Douglas-fir. The volume loss can be as high as 40% when the conk is present.

The fourth and most noticeable disease is dwarf mistletoe. The major species of dwarf mistletoe are Douglas-fir dwarf mistletoe *Arceuthobium douglasii*, western larch dwarf mistletoe *A. laricis,* ponderosa pine dwarf mistletoe *A. campylopodum*, and true fir dwarf mistletoe *A. abietinum*. Infection results in growth loss, reduction in wood quality, higher rate of mortality, and bole infections that result in deformation and dead tops. Mistletoe spreads by ballistically discharging seeds. The seeds are shot out 10 to 100 feet and land on needles of lower branches or understory host trees. Mistletoe infested trees are identified by the presence of mistletoe plants, witches brooms, branch and stem swelling, stem cankers, branch flagging, mortality or topkill, and remnant attachment of shoots (basal cups) on swellings. In units planned for treatment, plot samples have estimated that 40% of the basal area of Douglas-fir have moderate to extreme infections of mistletoe. Generally all other host trees within 50 feet of these infected trees also have a low to moderate amount of mistletoe.

Insects

Three significant bark beetles and a defoliator contribute to tree mortality and damage. The hazard and risk to each stand is related to the quantity of host trees, stand density, numbers of stand layers, and favorable breeding conditions. Keeping stands in a healthy vigorous condition is the most practical means of reducing tree damage and mortality caused by these insects.

The fir engraver *Scolytus ventralis* is the most common bark beetle in the planning area. Grand firs from pole size to larger trees are it's primary host. Trees may be killed outright, top killed, or survive repeated attacks. Attacks and outbreaks are usually associated with conditions that stress the trees. Trees infected with root disease are very susceptible to attacks. This beetle eventually kills the majority of stressed grand firs.

Past outbreaks of western spruce budworm *Choristoneura occidentalis* can be observed throughout the planning area. Its primary hosts are grand fir, Douglas-fir, and western larch. It has been attacking areas where host trees form multi-layered canopies. The last outbreak occurred 15 years ago, leaving dead tops and limbs in grand fir and Douglas-fir trees.

Forest Structure

The planning area is stratified into eight structure types. Chad Oliver defines six basic structure types in his book, Forest Stand Dynamics, Chapters 7-12 (Oliver, 1990). They have been modified and expanded into eight structure types to describe unique conditions on the Barlow Ranger District. Definitions of these terms are in the glossary. The desired percentage of each is a range determined by multiple scale analyses, blending the social objectives and historical disturbances of the area. The White River Watershed Analysis (WRWA) recommends the eight structure types be represented on the landscape at any given time. The Juncrock planning team further refined the amount and location of each structure type. The refinement was based on land allocations, fire history, productivity, existing conditions, and a balance of structure types to meet resource objectives.

The comparison of the desired future condition versus existing conditions reveals two important points: The four mature seral structure types (late seral multistory, open intolerant multistory, cathedral, and open parklike) are under represented on the landscape. The youngest to mid seral structure types (stand initiation, stem exclusion, and fire excluded multistory) are exceeding the desired condition high range.

Table 3-1 Desired Future Condition vs. Existing Condition

Structure Type	Desired Future Condition Range	Existing Condition Structure	Desired Future Condition Range	Existing Condition Structure
Stand Initiation	195 -390 acres	787 acres	5-10% of area	20% of area
Stem Exclusion	584 -1169	1212	15-30	31
Fire Excluded Multistory	0 -390	601	0 -10	15
Mature Stem Exclusion	0 -390	122	0-10	3
Open Parklike	39-195	50	1-5	1
Cathedral	974 -1948	416	25-50	11
Open Multistory	780 -1364	313	20-35	8
Late Seral Multistory	390 -780	394	10-20	10

See Map 6 for existing stand structure.

Stand Initiation Stand Structure
The stand initiation group in this planning area is made up of recent clearcuts. Tree heights vary from 5 to 20 feet. These are single layered stands. Total canopy closure ranges from 0 to 25 percent. Stands consist of 5 to 25 year old Douglas-fir, ponderosa pine, and western white pines. Tree diameters range from 1 to 6 inches. Older remnant trees are absent. In places, there is a significant shrub layer of vine maple, ceanothus, and manzanita. The general health of this structure type is very good. The only identifiable concern is the lack of tree species diversity for these plant associations.

This structure type makes up 20% of the existing stand structure in this planning area. There are approximately 787 acres of this structure type in the planning area, none of which will be entered this planning cycle.

Stem Exclusion Stand Structure
The stem exclusion group is made up of older reforested clearcuts. Tree heights vary from 20 to 45 feet. These stands consist of a dominant overstory and the beginning of a Douglas-fir and grand fir understory. Total canopy closure ranges from 70 to 90 percent. The overstory consists of 30 to 40 year old Douglas-fir, ponderosa pine, and grand fir. Overstory trees range in diameter from 8 to 18 inches. Older remnant trees are absent. In places there is a significant shrub layer of 20 to 80 percent canopy cover consisting of vine maple, ceanothous, and manzanita. The majority of this layer is dying due to overhead shading. The general health of these stands is good. The identifiable concerns are high stand density in some areas and lack of tree species diversity.

This structure type makes up 31% of the existing stand structure in this planning area. There are approximately 1212 acres of this structure type in the planning area. These stands will not be entered during this planning cycle.

Fire Excluded Multistory Stand Structure
The fire excluded multistory stand structure develops in the absence of light periodic disturbance, such as fire. Over time, lack of disturbance favors shade tolerant tree species that out compete and dominate all canopy layers.

These are highly variable two and three layered stands with a mix of shade tolerant and intolerant species. Total canopy closure ranges from 60 to 90 percent. The overstory trees consist of Douglas-fir, western hemlock, and grand fir. Scattered ponderosa pine, western larch, and western white pine can also be found. Overstory tree diameters range from 20 to 48 inches and have canopy closures of 5 to 50 percent. Trees in the mid-layer and understory consists of Douglas-fir, western hemlock, and grand fir, with western red cedar in the riparian areas. Mid-layer tree diameters range from 6-16 inches with canopy closures of 5 to 60 percent. Understory tree diameters are less than 6 inches with canopy closures of 5 to 20 percent. In places, there is a significant shrub layer of vine maple.

The general health of these stands range from poor to good. As a group their health is declining from competition due to density, stem decay, mechanical damage, and dwarf mistletoe. The

health variability of this structure type is due to the susceptibility of the true firs and hemlocks to insects and disease agents.

This structure type makes up 15% of the existing stand structure in this planning area. There are 601 acres of this structure type in the planning area, of which 243 acres are proposed for treatment (Units 1, 2, 3, 4, 6, 7, 10, 11, 12, 13, 14, 16, 17 and 20). The criteria for choosing these units is based upon poor stand vigor. These units have high levels of stem decay, insect activity, dwarf mistletoe, high percentage of disease and insect host trees, and blowdown. The stand basal area density has reached the maximum density attainable and highest mortality rate are occurring.

Mature Stem Exclusion Stand Structure
The mature stem exclusion stands originated from a stand replacing fire that burned around 1900. These are combination single layered or weak two layered stands of shade intolerant and tolerant species. Total canopy closure ranges from 70 to 90 percent. The overstory consists of Douglas-fir, western hemlock, and grand fir with diameters ranging from 8 to 20 inches. Canopy closures range from 50 to 80 percent. Older remnant trees are either absent or are widely scattered. The mid-layer consists of western hemlock and grand fir with diameters ranging from 5 to 10 inches and canopy closure of 0 to 30 percent. The understory is very sparse, canopy closure ranges from 0 to 10 percent. The understory consists of scattered vine maple shrubs and western hemlock or grand fir saplings. Understory trees are suppressed with diameters less than 4 inches. A thick mat of decomposing logs, limbs, and twigs covers most areas. The only gaps in the canopy are associated with old roadbeds.

The general health of these stands is fair, but declining. The major cause of declining health is stem decay and competition due to tree density. Indian paint fungus is beginning to appear in the western hemlock trees.

This structure type makes up 3% of the existing stand structure in this planning area. There are 122 acres of this structure type in the planning area. Treatments are proposed on 98 acres (Units 5, 15, 18, and 21). These units have the beginning stages of stem decay and a high percentage of diseased trees. The stand basal area density has reached the maximum density attainable and high mortality rate are occurring.

Open Parklike Stand Structure
The open parklike stand structure results from frequent low to moderate level disturbances that keep understory trees from developing. This is a structure type on drier, rocky areas or mixed within all other structure types.

These are combination single layered and two layered stands of shade intolerant and tolerant species. The total canopy closure ranges from 20 to 70 percent. The overstory consists of Douglas-fir, ponderosa pine, and grand fir ranging from 8 to 40 inches in diameter. Canopy closure ranges from 20 to 50 percent. Older remnant trees are absent or widely scattered. The mid-layer consists of Douglas-fir, ponderosa pine, and grand fir, ranging from 5 to 8 inches in diameter with a canopy closure of 0 to 30 percent. The understory, when present, consists of

suppressed Douglas-fir, ponderosa pine, and grand fir. The understory tree diameters are less than 5 inches.

The general health of these stands is fair. The major cause of declining health is competition due to high density on very low productivity sites.

This structure type makes up 1% of the existing stand structure in this planning area. There are 50 acres of this structure type in the planning area, none of which will be entered during this planning cycle.

Cathedral Stand Structure
The cathedral stand structure results from periodic low disturbances that keep shade tolerant understory trees from developing. In the past, this was a significant structure type on the moderate and low moisture aspects. Low intensity fires and/or timber harvest activities maintained this structure type. These are combination single layered or weak two layered stands of shade intolerant species. Total canopy closure ranges from 70 to 100 percent. The overstory trees consist of Douglas-fir, ponderosa pines, and grand fir, with scattered western larch, and western white pine. Overstory tree diameters range from 20 to 48 inches. Overstory canopy closure ranges from 50 to 80 percent. The mid-layer consists of Douglas-fir, and grand fir, 4 to 18 inch diameters, with canopy closure between 0 to 30 percent. When an understory is present, it consists of suppressed Douglas-fir, western hemlocks, and grand fir less than 4 inches in diameter.

The general health of these stands is fair to good. The major cause of declining health is stem decay, blowdown, and competition due to high density in the overstory.

This structure type makes up 11% of the existing stand structure in this planning area There are approximately 416 acres of this structure type in the planning area. Treatment is proposed for 121 acres (Units 8, 9 and 23). These units have minor levels of stem decay, insect activity, and blowdown. The stand basal area density has reached the maximum density attainable and high mortality rates are occurring. .

Open Multistory Stand Structure
The open multistory stand structure is the result of periodic low to moderate disturbances that favor shade intolerant tree species. In the past, this was a significant structure type on drier aspects and was maintained by mixed severity fires. These are two and three layered stands with a mix of shade tolerant and intolerant species. Total canopy closure ranges from 60 to 90 percent. The overstory trees consist of Douglas-fir, western hemlock, and grand fir, with scattered ponderosa pine, western larch, and western white pine. Overstory tree diameters range from 18 to 40 inches with canopy closures of 20 to 30 percent. The mid-layer consists of Douglas-fir, western hemlock, and grand fir with diameters of 6 to 16 inches and canopy closures ranging from 15 to 30 percent. The understory consists of trees generally less than 6 inches in diameter of young Douglas-fir, western hemlock, grand fir, and western larch, with a canopy closure of 20 to 30 percent. There is a significant shrub layer of vine maple.

The general health of these stands is fair to good. The major cause of declining health is stem decay in the mature trees and competition due to high density in all layers.

This structure type makes up 8% of the existing stand structure in this planning area There are approximately 313 acres of this structure type in the planning area. Treatment is proposed for 80 acres (Unit 19). This unit has high levels of stem decay, insect activity, dwarf mistletoe, and blowdown. The stand basal area density has reached the maximum density attainable and highest mortality rate.

Late Seral Multistory Stand Structure
The late seral multistory stand structure develops without periodic disturbances so that the understory could develop. This is a stable structure type of wet areas, such as perennial riparian zones or moist locations on north aspects.

These are two and three layered stands with a mix of shade tolerant and intolerant species. Total canopy closure ranges from 60 to 100 percent. The overstory trees consist of Douglas-fir, western hemlock, and grand fir with scattered ponderosa pine, western larch, and western white pine. Overstory tree diameters range from 20 to 48 inches with canopy closures of 20 to 60 percent. The mid-layer consists of Douglas-fir, western hemlock, and grand fir with diameters ranging from 20 to 48 inches. Canopy closures range from 20 to 60 percent. The understory consists of Douglas-fir, western hemlock, and grand fir less than 8 inches in diameter.

The general health of these stands is fair to good. The major cause of declining health is stem decay and competition due to high stem density.

This structure type makes up 10% of the existing stand structure in this planning area. There are approximately 394 acres of this structure type in the planning area, none of which will be entered during this planning cycle.

Timber Resource

Timber productivity over the planning area is moderate to high. The height of site index trees for Western hemlock ranges from 80 to 100 feet. All structure types except stand initiation, stem exclusion, and mature stem exclusion are at an age in their growth cycle where mean annual increment for height, diameter, basal area, or volume is at a maximum. This is referred to as culmination. Douglas-fir, ponderosa pine, western larch, and western white pine regeneration has been successful with clear cut and shelterwood silvicultural prescriptions. Control of pocket gophers has been necessary for regeneration.

The majority of the older stands were salvaged with a partial overstory removal. Intentional uneven age prescriptions have not been implemented in the planning area. Commercial thinning examples are very limited. Nearly all past harvest used a ground base logging system. In the Timber Emphasis (C1) management areas, even-age management is the preferred silvicultural system. However, uneven age management may be considered in the C1 management areas. In the foreground of the Scenic Viewshed (B2) management areas, uneven age management shall be considered. Evenage management may be considered. In the middle ground and background of the B2 management areas evenage management shall be considered. Uneven age

management should be considered on middle ground, and may be considered for background. (MHFP Table Four-21, page Four-88)

Direct and Indirect Effects

Alternative I

Vegetation Composition

No trees would be cut in Alternative I. There would be no change in species composition and stand density from management activities. Without treatment, stands proposed for treatment would continue to move from a high percentage of Douglas-fir, ponderosa pine, and western larch trees to stands dominated by grand firs and western hemlock. Any gap in the overstory created by mortality would fill in with grand fir and western hemlock. This alternative does not increase the percentage of preferred shade intolerant tree species. Table 3-2 shows basal area for Alternative I.

Table 3-2 Alternative I - Stand Density

Average Stand Basal Area	Shade Tolerant Trees[1] Basal Area	Shade Intolerant Trees[2] Basal Area
246 sq. ft.	76 sq. ft.	170 sq. ft.

1 Grand fir and western hemlock
2 Ponderosa pine, western larch, and Douglas-fir

Diseases and Insects

General management recommendations for reducing timber volume losses for the identified diseases include: (USDA Forest Disease Management Notes, USDA Forest Service, Pacific Northwest Region)

- ✓ Removing infected trees.
- ✓ Harvest host trees before they become over mature (less then 150 years).
- ✓ Maintain a vigorous stand. When partial cutting, select leave trees with proper form and vigor.
- ✓ Maintain proper stand density (55 to 70% of the full stocking basal area).
- ✓ Convert to non-host or less susceptible tree species.
- ✓ Minimize wounding in harvest operations, slash disposal, or pile burning.

Alternative I proposes no active management, therefore no recovery of timber volume would occur. The overstory of some units is collapsing due to disease and insect infestations. All proposed units have a high percentage of host tree species; all are exceeding the recommended stand densities. The majority of stands are dominated by an over mature component. The average stand basal area would fluctuate around 246 sq. ft. causing mortality in all tree species. The mortality from existing diseases and insects continues to create gaps in the existing overstory, leading the way to an understory of hemlock and grand fir. The larger, very limited numbers of ponderosa pine would continue to decrease. Unhealthy trees would continue to fall across Oregon State Highway 216 and FDR 2130.

Forest Structure

Alternative I proposes no stand treatments in this planning cycle. This alternative does not reduce the ingrowth around existing old growth trees. This alternative does not promote new

park like, cathedral, and open intolerant multistory stand types. Over time, there would be an increase in fire excluded multistory stand types and a loss of limited open park like, cathedral, and open intolerant multistory. The mature stem exclusion type would reach culmination early and thinning opportunities would be lost. Table 3-3 displays structure types.

Table 3-3
Alternative I - Desired Future condition vs. Existing Condition

Structure Type	Desired Future Condition Range % Of Area	Existing Condition Structure % Of Area
Stand Initiation	5-10	20
Stem Exclusion	15-30	31
Fire Excluded Multistory	0-10	15
Mature Stem Exclusion	0-10	3
Open Multistory	20-35	8
Cathedral	25-50	11
Late Seral Multistory	10-20	10
Open Parklike	1-5	1

Timber Resource

Alternative I harvests no trees and produces no wood products (0 MMBF), resulting in no net value from land allocations that schedule regulated timber harvest. (MHFP C1-016). The volume of future harvest would be considerably less due to timber loss from mortality and decay.

Direct and Indirect Effects

Alternative II

Vegetation Composition

Cutting trees and reforestation in Alternative II creates an obvious visual change in the tree species composition. The desired basal area would be achieved by a 51% reduction in existing basal area on 550 acres. The existing tree species diversity is maintained, with the shade intolerant trees becoming more dominant. This is accomplished by a higher retention preference for shade intolerant species in the marking guide. Approximately 163 acres of variable size openings, created by overstory tree removal or landings, would be reforested with shade intolerant trees. The leave trees would stand as individuals or with slight crown overlap in a variable density pattern.

Table 3-4 displays post harvest stand densities.

Table 3-4 Alternative II - Post Harvest Stand Density

Average Stand Basal Area	Shade Tolerant Trees[1] Basal Area	Shade Intolerant Trees[2] Basal Area	Desired Basal Area Range
125 sq. ft.	21 sq. ft.	104 sq. ft.	80-120 sq. ft.

1 Grand fir and western hemlock
2 Ponderosa pine, western larch, and Douglas-fir

Harvest, landing construction, and slash piling equipment would cause soil compaction. Burning of the landing piles could cause hydrophobic soil conditions. In areas with these impacted conditions, deep-ripping promotes reforestation survival and growth. The road closures that block reforestation activities would increase the cost of reforestation and monitoring by 10 to 20%. Any proposed road closure that blocks reforestation access by more than 1000 feet should be delayed until after the first survival monitoring. In areas with long-term unevenage prescriptions (452 acres), cutting trees, building landings, and skid roads impact the existing advanced regeneration and mid-layer of the preferred species. There are very few healthy smaller diameter trees. All activities should avoid or protect as many of these advanced regeneration areas as possible.

Diseases and Insects

Cutting trees in accordance with Alternative II objectives would remove many of the infected trees. The stand basal area density achieves the recommended stocking level, increasing the vigor of leave trees and lowering the chances of mortality. The stand should not achieve high mortality levels due to high densities for twenty to thirty years. The percentage of host and infected trees would be lowered. Where disease and insect problems are concentrated, the areas would be converted to less susceptible tree species. Falling, skidding, machine piling and burning of piles in the partial cuts could cause some wounding to leave trees. If the recommended silvicultural marking guides, harvesting, slash disposal, and monitoring strategies are not implemented this could be a serious silvicultural concern. Future volume could be lost, especially in the grand fir and hemlock trees. In the case of ponderosa pine which are already at high risk based on Keen's mistletoe risk-rating system, changing the stand density surrounding these trees would do little to lower the risk of mortality due to beetle attack. Trees that could fall across Highway 216 and FDR 2130 through Unit 11 would be harvested. The portion of trees that fall into the riparian area on the west side of 2130 would be left.

Forest Structure

The silvicultural prescriptions associated with Alternative II emphasize cutting trees that are considered weak or in competition with preferred trees of all sizes. This alternative develops under represented structure types from mature stem exclusion or fire excluded multistory structure types. This alternative results in a 7% increase in three under-represented stand structure types. It also lowers two overstocked structure types by 6%. This Alternative moves the area towards the Desired Future Condition, but does not reach DFC in all stands with this entry. Table 3 –5 displays changes to structure types.

Table 3-5 Alternative II - Desired Future Condition vs. Post Harvest Condition			
Structure Type	Desired Future Condition Range % of Area	Existing Condition Structure % of Area	Alternative 2 Post Harvest % of Area
Stand Initiation	5-10	20	20
Stem Exclusion	15-30	31	31
Fire Excluded Multistory	0-10	15	10
Mature Stem Exclusion	0-10	3	2
Open Multistory	20-35	8	13
Cathedral	25-50	11	12
Late Seral Multistory	10-20	10	10
Open Parklike	1-5	1	2

Timber Resource

Alternative II produces an estimated 9 MMBF of lumber and other wood products resulting in economic benefit from land allocations scheduled for regulated timber harvest. (MHFP C1-016). The general silvicultural theme is to phase into uneven age management instead of the FP recommended evenage silvicultural system. The reason for this change is to continuously provide owl dispersal corridors of variable tree densities across the uplands. Future options increase with this system. Another harvest can be planned on a cycle as short as ten years if needed. Unevenage management incurs higher costs, as the prescriptions are more complex, requiring a higher degree of skill during layout, other silvicultural treatments such as selective pre-commercial thinning, and more extensive monitoring of all activities. The option to return to evenage management is still possible.

Direct and Indirect Effects

Alternative III

Vegetation Composition

Cutting trees and reforesting units in Alternative III increases shade intolerant species and nearly eliminates the shade tolerant species on 550 acres. The majority of treated stands would change from having a high component of grand fir and hemlock to stands with a very high percentage of Douglas-fir, ponderosa pine, western white pine, and western larch trees. Approximately 303 acres of 5 to 40 acre openings would be reforested with shade intolerant trees. The shelterwoods would have a very open remnant overstory with a seedling understory. The trees in partial cuts would stand individually or with slight crown overlap in a variable pattern.

Table 3-6 Alternative III - Post Harvest Stand Density			
Average Stand Basal Area	Shade Tolerant Trees[1] Basal Area	Shade Intolerant Trees[2, 3] Basal Area	Desired Basal Area Range
58 sq. ft.	8 sq. ft.	50 sq. ft.	80-120 sq. ft.

1 Grand fir and western hemlock
2 Ponderosa pine, western larch, and Douglas-fir
3 This number is extremely low because the regeneration basal areas do not add significant square feet.

Harvest, landing construction, and slash piling equipment would cause soil compaction. Burning of the landing piles may cause hydrophobic soil conditions. In areas with these impacted

conditions, deep-ripping promotes reforestation survival and growth. The road closures that block reforestation activities would increase the cost of reforestation and monitoring by 10 to 20%. Any proposed road closure that blocks reforestation access by more than 1000 feet should be delayed until after the first survival monitoring. In areas with long-term unevenage prescriptions (88 acres), cutting trees, building landings, and skid roads impact the existing advance regeneration and mid-layers of the preferred species. These smaller diameter trees are very limited. To promote these smaller diameter trees, all activities should avoid or protect as much of this advanced regeneration as possible.

Diseases and Insects

Cutting trees with Alternative III objectives would remove nearly all infected trees. Stands with a partial cut prescription would have the same direct and indirect effects as Alternative II. In the shelterwood regeneration areas, very few host trees would remain. All remaining suppressed trees would be felled, piled, and burned as part of the site preparation. Reforestation would be with less susceptible tree species. The proposed road closures would increase the cost of future pre-commercial thinning operations. Stand density would remain below the threshold of mortality for at least fifty years. Wounding leave trees in shelterwoods would not be a concern. There is ample room for all phases of operation and there is no plan to harvest these trees. Most trees that could fall across Highway 216 and FDR 2130 would be harvested.

Forest Structure

Alternative III lowers by 7% three under-represented structure types. The majority of these treatments are regeneration harvest (305 acres). This would increase stand initiation acres by 8%. Alternative III lowers two high density structure types by 6%. The landscape would continue to be fragmented. Table 3-7 displays changes to structure types.

Table 3-7
Alternative III - Desired Future Condition vs. Post Harvest Condition

Structure Type	Desired Future Condition Range % of Area	Existing Condition Structure % of Area	Alternative 3 Post Harvest % of Area
Stand Initiation	5-10	20	*28*
Stem Exclusion	15-30	31	31
Fire Excluded Multistory	0-10	15	10
Mature Stem Exclusion	0-10	3	2
Open Multistory	20-35	8	8
Cathedral	25-50	11	10
Late Seral Multistory	10-20	10	10
Open Park like	1-5	1	1

Timber Resource

Cutting trees in Alternative III produces an estimated 16 MMBF of lumber and other wood products. This results in an economic benefit from land allocations scheduled for regulated timber harvest (MHFP C1-016). Additional trees harvested from shelterwood units add significant volume to the timber sale. Alternative III follows the recommended evenage silvicultural system of the Forest Plan. Regeneration harvest with minimum reserve trees is

prescribed for stands that have surpassed their culmination. Commercial thinning to promote radial growth is prescribed for healthier, high-density stands. Evenage management is a less complex silvicultural system, with lower costs, and less risk of future problems. Reserve trees would remain in the stand and would not be harvested.

Direct and Indirect Effects

Alternative IV

Vegetation Composition

Cutting trees and the reforestation in Alternative IV creates an obvious visual change in the tree species composition. The desired reduction in basal area is not achieved, exceeding it by 44%. This alternative lowers the number of smaller (<21" DBH) undesirable shade tolerant and host trees, but leaves 33% more of the larger trees (>21" DBH) than Alternative II. To achieve an unevenage structural condition, a favorable growing condition for all layers must be created. This includes a regeneration layer. Leaving 33% more basal area makes unevenage management unachievable. Leaving 33% more canopy favors shade tolerant species and eliminates conditions for preferred species. The existing tree species diversity is maintained. The shade tolerant trees would remain more dominant. Approximately 75 acres of variable size openings, created in the overstory by tree removal or landings, would be reforested with shade intolerant trees. The leave trees would stand as individuals or with some major crown overlap in a variable density pattern. Table 3-8 displays post harvest stand density for Alternative IV.

Table 3-8 Alternative IV - Post Harvest Stand Density

Average Stand Basal Area	Shade Tolerant Trees[1] Basal Area	Shade Intolerant Trees[2] Basal Area	Desired Basal Area Range
173 sq. ft.	31 sq. ft.	142 sq. ft.	80-120 sq. ft.

1 Grand firs and western hemlocks
2 Ponderosa pines, western larch, and Douglas-firs

All other species composition effects are similar to Alternative II.

Diseases and Insects

Cutting trees in accordance with Alternative IV objectives would remove a portion of the infected trees. The stand basal area density does not achieve recommended stocking level and does not improve leave tree vigor. The stand would continue to have high mortality levels. The percentage of host trees is lowered. Infected trees over 21 inches in diameter remain, especially dwarf mistletoe infested Douglas-fir. Only half the area would be converted to less susceptible tree species where the disease and insect problems are concentrated. Leaving mistletoe-infected overstory would increase the rate of spread to the understory. Because there are more leave trees, the falling, skidding, machine piling and burning of the piles could cause more wounding to remaining trees. This could become a silvicultural concern. More volume loss from insects, disease and competition is predicted in all species than any other action alternatives. Trees over 21 inches in diameter that could fall across Highway 216 and FDR 2130 would be harvested.

Forest Structure
Alternative IV is similar to Alternative II. Alternative IV silvicultural prescriptions emphasize cutting trees that are considered weak or interfering with preferred trees of all sizes. This alternative develops under-represented structure types from over dense mature stem exclusion, and fire excluded multistory structure types, but leaves them at a higher post harvest density, due to the diameter limit. Cutting trees results in increasing the area of the three under-represented open mature structure types in the planning area by 7%. It also lowers the two high-density structure types by 6%. Table 3-9 displays changes to structure types.

Table 3-9
Alternatives IV - Desired Future Condition vs. Post Harvest Condition

Structure Type	Desired Future Condition Range % of Area	Existing Condition Structure % of Area	Alternative IV Post Harvest % of Area
Stand Initiation	5-10	20	*20*
Stem Exclusion	15-30	31	*31*
Fire Excluded Multistory	0-10	15	10
Mature Stem Exclusion	0-10	3	2
Open Multistory	20-35	8	11
Cathedral	25-50	11	14
Late Seral Multistory	10-20	10	10
Open Park like	1-5	1	2

Timber Resource
Cutting trees in Alternative IV produces an estimated 5 MMBF of lumber and other wood products. This results in an economic benefit from land allocations scheduled for regulated timber harvest (MHFP C1-016). The volume of material removed is the lowest of all action alternatives. The value is lower because of the higher percentage of trees less than 8 inches in diameter. All other timber resource effects are similar to Alternative II.

Cumulative Effects
As required by the NWFP, an analysis area consisting of all federal land within the 5th field White River watershed and the 6th field Beaver Creek watershed was used in the assessment to determine if the amount of late-successional forest is greater than 15% (ROD, C-44). The assessment includes all land allocations and uses the definition of late-successional forest defined by the NWFP. The analysis assumes all timber sales are harvested as planned and the predicted post harvest stand conditions occur. The analysis conclusion is a projection after all timber sales are harvested in approximately ten years.

In 1996, an analysis was completed using three different data sets. All of them indicated there is more than 15% late-successional stands left in the watersheds. The analysis concluded the Mt. Hood National Forest Current Vegetation Survey (CVS) plot data was the most recent and reliable of the data sets. This data set indicates the existing percentage of late-successional stands is 66%. The CVS was established in 1996 as a broad-scale vegetation inventory and monitoring system with a defensible database of ground resource estimates that can be used to

periodically assess vegetation and monitor changes in vegetation over time (Research Paper PNW-RP-493 1996).

Using the Mt. Hood NF GIS layers and overlaying all recent regeneration-harvested units and all proposed units over the original plots lowered the amount of late-successional stands to 63%. There has only been a slight decrease in the percentage of late-successional stand acres due to a stronger effort to prescribe partial cutting versus regeneration. Partial cutting late successional stands changes the structure type, but maintains their late successional classification. Since 1996, two of the CVS plots became older then 80 years old, qualifying them to be considered late-successional. This maturity causes an increase to 68%.

3.2 MANAGEMENT OF COMPETING AND UNWANTED VEGETATION

This analysis is guided by the Record of Decision and Mediated Agreement for the Managing Competing and Unwanted Vegetation" Final Environmental Impact Statement (referred to as VEG EIS). The purpose of this analysis is to provide information to decision makers and interested publics about proposed treatments and how they might affect unwanted vegetation. Of particular interest is the question of herbicide use. Slash is considered unwanted vegetation, so another key question is what post harvest and road construction treatments of slash and brush would be needed to achieve reforestation goals. Noxious weeds would also be addressed.

Appropriate design criteria would be identified and incorporated into any vegetation management project work to minimize potential adverse impacts to the environment, project workers, and public.

The use of herbicides is not being proposed for any of the activities associated with the Juncrock Timber Sale.

Site Analysis For Site Preparation

Site-specific vegetation management objectives have been developed. The following list of objectives would be used to identify the “damage thresholds” for vegetation management, vegetation management strategies and the feasible treatment methods.

Site Specific Objectives:

- ✓ ˜ Meet the recommended stocking levels within five years after harvesting.
- ✓ ˜ Meet standards for minimizing soil erosion and soil degradation.
- ✓ ˜ Maintain adequate levels of downed woody debris and snags.

Nature and Role of Associated Vegetation

Currently, the overstory in the stands proposed for site preparation treatment is comprised of mixed conifers with mistletoe infestation and Indian paint fungus. Harvest operations would put slash on the ground creating physical barriers to planting. The large woody debris contributes to the productivity of the site by providing a long-term source of nutrients.

Damage Thresholds
Post-treatment/preplanting "damage thresholds" have been identified for this site based upon operational experience and the site-specific management objectives. If slash exceeds the following levels prior to planting, treatment would be needed.

Damage thresholds:
1. Less than 350 well-distributed planting spots per acre.
2. Greater than 5 tons/acre of slash in the 0-3" size class (could exceed 5 tons per acre if the arrangement of the fuels do not present a fire hazard).

Harvest units, where reforestation is proposed, are expected to need treatment of slash so that management objectives can be met. Past experience in this area shows that if trees are established immediately after site preparation, no release treatments from competing brush is required to meet the stand growth objectives. This past experience includes professional expertise of local silviculturists and monitoring data from plantation survival exams and precommercial thinning exams from adjacent plantations.

Strategies
Five strategies for controlling unwanted vegetation are identified in the FEIS and Exhibit A of the Mediated Agreement. These are prevention, early treatment, maintenance, correction and no action. The following analysis will focus on the prevention, correction and no action strategies (refer to Section II-72 through 11-74 in the *VegetationManagement FEI*S). The prevention strategy is a required element and the preferred strategy in the VEG EIS to consider and analyze.

No Action Strategy
"No Action" means that after harvest, planting would occur with no site preparation activity and slash and brush would be left unaltered on the site. It would be the appropriate strategy anytime there is evidence that the damage thresholds would not be exceeded. Within the Juncrock Timber Sale harvest units, there is evidence that the no-action strategy would not meet management objectives and standards and guidelines because the damage thresholds would be exceeded.

Prevention Strategy
The prevention strategy would not involve direct treatment but would detect and ameliorate the conditions that cause or favor the presence of competing or unwanted vegetation before damage thresholds are reached. Prevention is the selected strategy for herbicide use. Early corrective action to reduce slash and brush prior to planting (described below) would result in successful reforestation and no herbicide treatments now or in the future would be needed.

Correction Strategies
Vegetation management action would likely be necessary to reduce the amount of post-harvest live vegetation and slash to a point below the damage threshold. A post-harvest review would be conducted to make a final determination because there may be small areas where the no-action strategy is appropriate. Grapple piling and burning may occur where the correction strategy is selected.

Mechanical Treatment and Burning –
This method could use a track-mounted vehicle with a grapple-type device to pile a large portion of the slash. It would also be used to pull out the larger live vegetation and pile it with the slash.. Grapple piling and burning would be a very effective corrective method on sites with less than 30% cover of larger vegetative plants. More than 500 well-distributed planting spots per acre would be made available. Piles would be burned prior to planting. Piles can be burned in the fall when smoke dispersal conditions are favorable and pile burning has a relatively low level of safety concern for workers doing the burning and there is low risk of escaped fire situations. This method would cost approximately $300 per acre.

Design Criteria
In addition to the design criteria for the Juncrock Timber Sale, the following general guidelines from the Vegetation Management FEIS (Chapter II) should be followed: Develop a silvicultural prescription, approved by a certified silviculturist with a site-specific diagnosis and treatment needs. Develop a site specific prescribed burning plan approved by a line officer. A job hazard analysis would be developed and discussed by workers to reduce exposure to hazards such as use of power tools, fire and walking in difficult terrain.

Human Health Effects
The human health effects of mechanical treatments would be very low and would be limited to the operator who is inside a protected machine. Risks would increase as slopes increase. The risk to the general public would be very low.

Prescribed burning has the potential for both short and long-term effects to both workers and members of the public. There is the possibility of an escaped fire situation. Burning is only conducted during specific parameters of fuel moisture, humidity and wind speeds when the risk of catastrophic fire is low.

Alternatives
Alternative I
The No Action Strategy for vegetation management would apply.

Alternatives II and III
A combination of prevention and correction strategies would be most effective. The corrective strategy would reduce the expected level of fuel loading and/or fire hazard following harvesting. Successful completion of this treatment would prevent the need for the use of herbicide to control unwanted vegetation at a later date.

Alternative IV
The strategy and effects of Alternative IV would be similar to those of Alternative II or III, with the following exceptions. Because of the higher number of trees being left and the closer spacing, there would be an increase in damage to the leave trees from equipment during the site preparation and piling phase. In addition, the tighter spacing presents an increased risk of damage to the residual trees when the piles are burned. The cost of treatment would be higher due to the extra time that would be necessary to work around the higher number of leave trees.

Project Monitoring
Post treatment monitoring would be conducted to determine the effectiveness of site preparation and survival rates for planted trees.

3.3 Plants, Lichens and Fungi

Table 3-10
Summary of Botany Pre-Field Review and Survey Results

Species	Life Form	On District	Habitat Present	Habitat	Survey	Found
Agoseris elata	Forb	Documented	NO	Moist meadows	NO	
Arabis sparsiflora var artorubens	Forb	Documented	NO	Dry shrub oak areas	NO	
Astragalus tyghensis	Forb	Suspected	NO	Biscuit scab lands	NO	
Botrychium minganense	Fern	Documented	YES	Cedar seeps	YES	NO
Botrychium montanum	Fern	Documented	YES	Cedar seeps	YES	NO
Botrychium pinnatum	Fern	Documented	YES	Cedar seeps	YES	NO
Castilleja thompsonii	Forb	Documented	NO	Dry rocky peaks	NO	
Lomatium watsonii	Forb	Suspected	NO	Dry ridges	NO	
Lycopodium complanatum	Fern	Suspected	NO	Old burns	YES	NO
Ranunculus reconditus	Forb	Suspected	NO	Dry rocky ridges	NO	

Existing Condition

Region 6 sensitive plants:
No Region 6 sensitive plants were located in activity areas. See Table 3-10, and the Biological Evaluation in Appendix E. Habitat was found for 3 species of R6 sensitive plants, however the habitat was marginal based on field observations of several known populations. *Botrychium minganense, Botrychium montanum* and *Botrychium pinnatum* may occur in stable moist areas and seeps, usually near western red cedar. *B. minganense* and *B. montanum* are included in the Survey and Manage Standards and Guidelines and Category Assignments (June 2002). Surveys were conducted to protocol.

S&M FSEIS species with management requirements
Survey and Manage Standards and Guidelines and Category Assignments (June 2002). Surveys are required and were conducted.

The lichen *Nephroma occultum* was not found in the planning area. There is marginally suitable habitat present. There is a known site about 3 miles west of the project area in the Hilynx planning area. This site appears to be an anomalous outlier. This lichen is most often found west of the Cascade crest at lower elevations in much wetter habitat. It is usually found high in old growth trees. The site in the Hilynx planning area is located on the side of a small grand fir bole about 8 feet up.

Schistostega pennata was not found in the project area. A known site is located within 5 miles of the area. It is a moss found on mineral soil, almost always on root wads of fallen trees in wet

or high humidity circumstances. The species is probably not present in the planning area. This opinion is based on professional judgment derived from experience discovering new sites across the forest and visiting several populations of previously known sites. However, because the spores are believed to by spread by insects and some sites are well separated from other known sites, it is possible for it to show up along Frog or Clear Creek.

Direct and Indirect Effects
Cutting timber causes a potential loss of individual sites of *N. occultum* and its habitat in the cut trees. There are no known sites *N. occultum* in the Juncrock planning area. Cutting trees may eliminate undiscovered individuals and reduce some habitat in the hemlock zone such as Unit 8. Assuming the potential to lose individuals and habitat is proportional to the volume of timber removed, Alternative I would have no impact, Alternative IV would have the least potential impact and Alternative III the greatest. This lichen has been associated with old growth, but is apparently not old growth dependant. The nearest individual is on a younger tree in a rather open site so it is assumed it could be in any of the more moist stands of the planning area, however based on what is known of the lichen's distribution and habitat it is unlikely that it is present in the project area. The risk of adverse impacts is considered low.

Harvest activities in riparian areas would have no effect to plants, lichens, and fungi species of concern. There is some potential habitat for three species of grape ferns *Botrychium* & one species of moss *S. pennata* in wet areas. Some units include portions of riparian buffers but none of the proposed activities include the cedar seep areas that are the habitat for the *Botrychium* species andother wet areas for the moss *S. pennata* species of concern.

Skidding, grapple piling, burning slash piles would cause a reduction of litter and duff layers, exposing bare soil leading to a possible increase of area infested with noxious weeds. There would be no effect to plants, lichens, and fungi species of concern. *N. occultum* is an epiphyte and grows only on trees. Its habitat will be unaffected by weeds. The habitat for the three *Botrychium* species and *S. pennata* will remain undisturbed with sufficient canopy to discourage the noxious weeds of concern, knapweeds, houndstongue and tansy.

Cumulative effects
Area of analysis for botany is the Juncrock and Hilynx planning areas.
Assumptions: The known *N. occultum* site in Hilynx is well buffered and is not expected incur any noticeable effects from activities. Considering the aggregate of the potential habitat in the two planning areas, less than half would be affected and in activity areas much of the potential habitat would remain.

There is no effect to the *Botrychium* species and *S. pennata*. There are no proposed activities likely to affect any sites suitable for these species.

3.4 Wildlife

Existing Condition

The complete Biological Evaluation is located in the Appendix. The status of threatened, endangered, and proposed species; USFS Region 6 sensitive species, FSEIS survey and manage species, and other NWFP special mention species with potential to occur in the planning area are shown in Table 3-11.

Table 3-11 Wildlife Survey Results

Species	Habitat	Surveys	Presence
Threatened, Endangered or Proposed			
Bald eagle *(Haliatus leucocephalus)-Threatened*	N	-	-
Northern spotted owl *(Strix occidentalis caurina)-Threatened*	Y[1]	N[2]	Y[1]
Canada lynx *(Lynx canadensis)- Threatened*	N[1]	Y[1]	N[1]
R6 Sensitive Species			
Oregon Slender salamander *(Batrachoseps wrighti)*	Y[1]	Y[1]	N[1]
Larch Mountain salamander *(Plethodon larselii)*	Y[1]	Y[1]	N[1]
Cope's giant salamander *(Dicomptodon copei)*	N	-	-
Cascade torrent salamander *(Rhyocotriton cascadae)*	N	-	-
Oregon spotted frog *(Rana pretiosa)*	N	-	-
Painted turtle *(Chrysemys picta)*	N	-	-
Northwestern pond turtle *(Clemmys marmorata marmorata)*	N	-	-
Baird's shrew *(Sorex bairdii permiliensis)*	N	-	-
Pacific fringe-tailed bat *(Myotis thysanodes vespertinus)*	Y	N	N
Wolverine *(Gulo gulo luteus)*	Y[1]	N[1]	Y[1]
Pacific fisher *(Martes pennanti)*	Y[1]	N[1]	N[1]
Horned grebe *(Podiceps auritus)*	N	-	-
Bufflehead *(Bucephala albeola)*	N	-	-
Harlequin duck *(Histrionicus histrionicus)*	N	-	-
Peregrine falcon *(Falco peregrinus anatum)*	N	-	-
Gray flycatcher *(Empidonax righti)*	N	-	-
Survey and Manage Species not on R6 Sensitive Species List			
Great gray owl *(Strix nebulosa)*	N[1]	Y[1]	N[1]
Oregon red tree vole *(Arborimus longicaudus)*	N	-	-
Puget oregonium *(Cryptomastix devia)*	N[1]	Y[1]	N[1]
Columbia oregonium *(Cryptomastix hendersoni)*	Y[1]	Y[1]	Y[1]
Dalles sideband *(Monadenia fidelis minor)*	Y[1]	Y[1]	N[1]
Crater Lake tightcoil *(Pristiloma arcticum crateris)*	N	Y	N
Evening fieldslug *(Deroceras hesperium)*	Y[1]	Y[1]	N[1]
NWFP Special Mention Species			
Black-backed woodpecker *(Picoides arcticus)*	N	N-	N-
Flammulated owl *(Otus flammeolus)*	N	-	-
Pygmy nuthatch *(Sitta pygmaea)*	N	-	-
White-headed woodpecker *(Picoides albolarvatus)*	N	-	-
Species	**Habitat**	**Surveys**	**Presence**
Mt. Hood NF Management Indicator Species and Neotropical Birds			
Mule Deer (*Odocoileus hemionus*) and Elk (*Cervus elaphus nelsoni*)	Y[1]	N[1]	Y[1]
Pileated Woodpecker *(Dryocopus pileatus)* Habitat Area (B-5)	Y[1]	N[1]	Y[1]

Pine Marten *(Martes americana)* Habitat Area (B-5)	N	-	-
Merriam's Turkey *(Meleagris gallopavo)*	N	-	-
Silver Gray Squirrel *(Sciurus griseus griseus)*	N	-	-
Snag and Down Log Associated Species	Y[1]	N[1]	Y[1]
Neotropical Migratory Birds	Y[1]	N[1]	Y[1]

1 - See narrative.
2 - The last surveys were conducted in 1993. In accordance with the NWFP, additional surveys are not needed in this area.

3.4.1 Threatened, Endangered or Proposed Species:

Bald eagle:
There is no potential habitat within or adjacent to the planning area, nor have bald eagles been observed in the area.

Northern spotted owl:
The northern spotted owl inhabits the planning area. A 100 Acre LSR (#2156 at 124 acres) has been identified and designated for the one owl activity center known at the time of adoption of the NWFP. Two additional owl activity centers with 100 Acre LSR's (#2037 and #2161) are within 1.2 miles of the planning area and located within the White River LSR. A survey conducted for installation of a fiber optic cable through the center of the planning area, detected a northern spotted owl response to the east of the planning area and outside of existing LSR's, but none within the planning area. Nearly all of the proposed planning area (3865 acres) is within the OR 2 critical habitat unit (CHU) established by the USFWS. The CHU was established because of potential for loss of dispersal habitat below levels necessary to insure adequate dispersal of the species across the landscape. The White River LSR Assessment recognized the need for dispersal habitat across the landscape and designated a dispersal corridor (area of concern, Mt. Hood NF and US Fish Wildlife Service). This corridor includes most of the Juncrock planning area.

Spotted owls nest in platform nests with this area. Dwarf mistletoe brooms or other branch deformities may create these platform nest sites. Total nesting, roosting and foraging habitat (NRF) in the planning area is 810 acres. About 755 acres also provide NRF or marginal NRF habitat for a total of about 1565 acres (40.5% of the proposed planning area). Approximately 281 acres of dispersal habitat makes up 7.3% of the planning area. The remaining 2019 acres (52.2% of the planning area) are neither dispersal nor NRF habitat. All NRF habitat is also dispersal, therefore when considering how much total area is available for dispersal, the NRF and dispersal habitat acres must be added together. A desired goal is to have 50% of a given area in dispersal habitat. This planning area currently contains 47.8% dispersal habitat.

Canada lynx:
The Canada lynx was listed as a threatened species in January 2000. Canada lynx and its habitat are not present on the Mt. Hood National Forest.

3.4.2 R-6 Sensitive Species:

Oregon slender salamander:
The Oregon slender salamander was listed as a R6 sensitive species in 2000. Oregon slender salamander habitat has been described as evergreen forests, older second-growth, and old growth Douglas-fir with large numbers of large logs and stumps (Amphibians of Washington and Oregon, Leonard, et al 1993 and Amphibians of Oregon, Washington and British Columbia, Corkran and Thoms 1996). These conditions occur in the planning area, however no Oregon slender salamanders were found in the fall of 2000 Larch Mountain salamander surveys of the Juncrock planning area.

Density of Oregon slender salamanders seems closely tied to stands with 40 percent or greater canopy closure and moderate levels of coarse to large down wood. Oregon slender salamanders were also found in logged and burned areas provided there was still canopy shading and some down wood remaining.

Larch Mountain salamander:
Surveys were conducted in the fall of 2000 in accordance with the October 1999 protocol. No Larch Mountain salamanders were found. Suitable conditions for Larch Mountain Salamander are not present within the proposed units. Surveys north of the Columbia River have found this species under conifer stands where litter, duff, large woody material, and moisture conditions are sufficient. The substrate beneath the litter/duff tended to be open, porous rocky material with talus like characteristics. The soil conditions within the proposed units are relatively tight with virtually no spaces suitable for salamanders to descend into as the substrate dries.

Pacific fringe-tailed bat:
Suitable riparian foraging conditions occur within and adjacent to the planning area. No surveys were required or conducted; however presence is assumed. Roost and hibernation sites are generally in crevices within caves, mines, and old wooden bridges and buildings, although snags and large trees also may be important. No caves, mines, wooden bridges, or buildings are in the planning area.

Wolverine:
No denning habitat occurs in the planning area, and foraging habitat appears to be highly variable. Wolverine tracks have been observed about 8 miles northwest of the planning area. Because of the open road density and the snowmobile use of the area in winter, occupancy by wolverine is very unlikely except as a transient moving through the area.

Pacific fisher:
Possible fisher and the related marten tracks were found in several locations within two to five miles of the planning area. Both species are assumed to be present. The planning area is at an elevation and snow zone that should support fisher if other conditions are satisfactory.

Fishers are not dependent upon late-successional forests, but appear to require closed-canopy forests that vary in age as long as they contain adequate prey populations. Besides continuous canopy, fishers also prefer forests that have complex physical structure near the forest floor.

Natal den site needs appear to be restricted to cavities in trees or snags over 20 inches in diameter and generally are over 20 feet above ground. Some large diameter snags do occur within the planning area, both within units and outside them.

3.4.3 Survey and Manage Species:

Great gray owl:
Surveys of all potential habitats across the Barlow RD including the planning area have been conducted with no great gray owls found. Meadows or natural openings of adequate size do not occur in the planning area. Great gray owls are mostly associated with grassy meadows and openings next to forested areas, where they feed on voles and pocket gophers. Prey availability is considered a major factor in great gray owl abundance (Hayward and Verner 1994).

Puget oregonium:
This snail species was not found during the mollusk surveys conducted for the planning area. This snail species has a strong riparian habitat association with permanent streams, springs and seeps; and moist shaded ravines that usually have some deciduous component. The known range of Puget oregonium is from southern Vancouver Island to the north side of the Columbia Gorge and it is considered relatively rare.

Columbia oregonium:
This snail was found at four locations in the Juncrock planning area. All locations are within the hemlock zone with at least moderate levels of large woody debris and at least a minor component of hardwoods. Three of the locations are associated with relatively mature closed canopy forest with a hemlock component. One location is in a stand dominated by 8 to 20 foot tall vine maple with a light conifer overstory.

Dalles sideband:
This snail was not found in the Juncrock planning area. The snail has been found on the Barlow Ranger District in habitat similar to the planning area.

Evening fieldslug:
This slug species was not found in the planning area. The limited available information on habitat includes varied low vegetation, litter, debris, down wood and rocks. It appears to be very rare, with 1969 being the last report of a living Evening fieldslug.

3.4.4 NWFP Special Mention Species:

Black-backed woodpecker:
Black-backed woodpecker habitat is not present within the planning area. The primary habitat is in lodge pole pine stands. There are no lodge pole pine stands with in the Juncrock Planning Area.

3.4.5 Mt. Hood National Forest Management Indicator Species:

Deer and Elk:
The Juncrock planning area is classified as summer range for black-tail deer and Rocky Mountain elk, and is inhabited by both during the summer period and mild winters.

Approximately 48% (1850 acres) of the planning area is classified as thermal cover and 18% (700 acres) is classified as optimal cover. The planning area exceeds the MHFP S&G (FW-206) of at least 15% thermal and 15% optimal cover. Approximately 6% (250 acres) is foraging habitat. The desired amount is 20 percent on summer range. The remaining 46% (1765 acres) is hiding cover with various levels of forage mixed in. Fawning and calving habitat is scattered throughout the planning area, with most concentrated in and near the riparian reserves.

There are 30.98 miles of open road used to calculate wildlife open road density, for a density of 5.13 miles/mile^2. This is above the 2.5 miles/mile^2 standard. Road Tables are located in the Appendix.

The effect of the motorized trail use on the 1.04 square mile McCubbins Gulch OHV trail area, south of the Clear Creek irrigation ditch is additive to the open road density. Therefore, that area was isolated from the remaining planning area for computation of effective open road densities. With 2.68 miles of motorized trails and 6.03 miles of open roads, the effective open road/trail density for motorized use on the McCubbins Gulch motorized trail area is 8.38 miles/mile^2 . This exceeds the summer open road density standard of 2.5 miles/mile^2 .

The remainder of the planning area is 5.00 square miles with 22.27 miles of roads with motorized use, yielding 4.45 miles/mile^2 which exceeds the standard of 2.5 miles/mile^2 .

Pine Marten and Pileated Woodpecker Habitat Areas:
Pileated woodpecker habitat area #2011W (838 acres) is located mainly within the Camas planning area, however a small portion protrudes into the Juncrock planning area. More than 300 (MHFP B5-008, 9) acres of contiguous late seral habitat exists within the Camas planning area.
See Map 17 for pine marten (2151M) and pileated woodpecker (2011W) in appendix.

Snag and Down Log Associated Species:
Snags (standing dead trees) and down logs are essential components in forests. Many wildlife species depend on them for survival. The MHFP (FW-215, 216, 217) recommends a 40% biological potential (0.9 snags/acre) for cavity nesting species across the landscape and a 60% biological potential (1.35 snags /acre) in new timber harvest units (Wildlife Habitats in Managed Forest, Thomas et al, 1979). The planning area meets the 40% level. Timbered stands within the planning area generally exceed the 100% biological potential (2.25 snags/acre) and the areas of past timber harvest are at or below the 40% level.
The ROD recommends 240 linear feet of down logs per acre greater than 20 inches in diameter within the matrix areas. The density of down logs varies across the planning area. Timbered areas meet or exceed the recommendation. Harvested areas are at or below the recommendation.

Neotropical Migratory Birds:
These species occupy a variety of structure types within the planning area. All habitat structures from late seral (old growth) to early seral openings (existing plantations) that could be expected within the lower western hemlock zone are present. All neotropical species associated with these habitats are assumed to be present. Approximately 22% (850 acres) of the area should support late seral dependent species such as hermit thrush. About 40% of the late seral acres are riparian

reserves commonly containing a mix of conifer and hardwood vegetation potentially suitable for species such as red-breasted sapsuckers. About 49% (1894 acres) should support mid-seral dependent species such as Cooper's hawk, and 29% (1120 acres) should support early seral dependent species such as olive-sided flycatchers and red-tailed hawk.

3.4.6 Direct, Indirect, and Cumulative Effects of Alternatives I, II, III, and IV:

The complete wildlife biological evaluation/biological assessment and survey and manage species effects can be found in the Appendix.

Table 3-12 displays the effects summary of threatened, endangered and proposed species; USFR Region 6 sensitive species; FSEIS survey and manage species; and other NWFP special mention species with the potential to occur in the Juncrock Planning Area.

Table 3-12 - Effects for Wildlife				
Species	Alt. I	Alt. II	Alt. III	Alt. IV
Threatened and Endangered Species				
Bald Eagle	No Effect	No Effect	No Effect	No Effect
Northern Spotted Owl	MEILTAE	MEILTAE ME-NLTAE	MEILTAE ME-NLTAE	MEILTAE ME-NLTAE
Canada Lynx	No Effect	No Effect	No Effect	No Effect
R6 Sensitive Species				
Larch Mountain Salamander	No Impact	No Impact	No Impact	No Impact
Oregon Slender Salamander	No impact	MII	MII	MII
Pacific Fringe-tailed Bat	No Impact	MII	MII	MII
Wolverine	No Impact	MII	MII	MII
Pacific fisher	No Impact	MII	MII	MII
Survey and Manage Species not on R6 Sensitive Species List				
Great Gray Owl	No Habitat	No Habitat	No Habitat	No Habitat
Puget oregonium	SN	SN	SN	SN
Columbia oregonium	SF	SF	SF	SF
Dalles sideband	SN	SN	SN	SN
Evening fieldslug	SN	SN	SN	SN

MEILTAE—May Effect and Is Likely To Adversely Effect
ME-NLTAE—May Effect-Not Likely To Adversely Effect
MII-May Impact Individuals, but are not likely to impact populations, nor contribute to a potential loss of viability of the species
SN---Surveyed, not found
SF--- Surveyed, found

3.4.7 Effects on Threatened, Endangered, or Proposed Species:

Northern spotted owl:

Direct and Indirect Effects of Alternative I:

There would be no harvesting trees within the proposed units. The existing disease and other health problems would continue to degrade nesting, roosting, and foraging habitat and dispersal habitat over the next 10 years. A total of 57 acres of NRF and 9 acres of dispersal habitat would be lost within 10 years with no treatment. These losses in habitat are not likely to result in breaches of the dispersal corridor/area of concern in the planning area.

Direct and Indirect Effects of Alternative II:
The cutting of timber would reduce NRF and dispersal habitat. This results in the following changes to habitat: the loss of 57 acres of NRF habitat, a downgrading of 28 acres of NRF habitat, and the direct loss of 28 acres of dispersal habitat. There is an additional degradation of 264 acres of nesting, roosting and foraging habitat, and 78 acres of dispersal habitat. The resulting net change would be a loss of 85 acres of NRF habitat, and no change in acres of dispersal habitat. These losses in habitat would not result in breaches of the dispersal corridor in the planning area nor would it substantially reduce its effectiveness. Post treatment nesting, roosting, and foraging habitat would be approximately 38.3% (1480 acres of the planning area), a loss of 85 acres. Dispersal habitat would be approximately 7.3% (281 acres of the area), no net change from present. Total dispersal habitat, which includes NRF habitat, would be 45.6% (1761 acres), a net loss of 85 acres.

The net effect of Alternative II in 10 years versus no treatment is 28 acres less NRF habitat, 9 acres more dispersal habitat. This would have a negative effect on spotted owl habitat.

Alternative II is within the incidental take, reasonable and prudent measures, terms and conditions, and conservation recommendations of the Biological Opinion issued by the USFWS (Willamette Province fiscal Year 1999, Habitat Modification Biological Assessment (BA) for Effect to Listed Species).

The dispersal corridor designated by the White River LSR Assessment/area of concern along Frog Creek and Clear Creek to allow connectivity north and south across the Mt. Hood National Forest would remain intact.

Direct and Indirect Effects of Alternative III:
The cutting of timber would reduce NRF and dispersal habitat. This would result in the loss of 179 acres of NRF habitat, a downgrading of 2 acres of NRF habitat, and the direct loss of 36 acres of dispersal habitat. There would be an additional degradation of 168 acres of NRF habitat and 71 acres of dispersal habitat. Post treatment NRF habitat would be approximately 35.8% (1384 acres), a loss of 181 acres. Dispersal habitat would be approximately 6.4% (248 acres), a loss of 33 acres. Total dispersal habitat, which includes NRF habitat, would be 42.2% (1632 acres), a net loss of 214 acres.

This alternative proposes more regeneration harvest prescription than the other alternatives. The net effect of the proposed action over 10 years versus no treatment would be 124 acres less NRF habitat, 24 acres less dispersal habitat. This alternative would remove the most dispersal habitat, with 42.2% remaining. The regeneration harvest units would take 40 to 50 years to reestablish dispersal habitat. The desired condition is 50% of any area in dispersal habitat. This would have a negative impact on spotted owl habitat.

Alternative III is within the incidental take, reasonable and prudent measures, terms and conditions, and conservation recommendations of the Biological Opinion issued by the USFWS (Willamette Province fiscal Year 1999, Habitat Modification Biological Assessment (BA) for Effect to Listed Species).

The dispersal corridor would not be breached but would be reduced in effectiveness.

Direct and Indirect Effects of Alternative IV:
The cutting of timber would reduce NRF and dispersal habitat. This would result in the loss of 20 acres of NRF habitat, a downgrading of 46 acres of NRF habitat to dispersal habitat, and the direct loss of 22 acres of dispersal habitat. There would be an additional degradation of 283 acres of NRF habitat, and 84 acres of dispersal habitat. Post treatment NRF habitat would be about 38.7% (1499 acres), a loss of 66 acres. Dispersal habitat would be approximately 7.9% (305 acres), a gain of 24 acres. Total dispersal habitat, which includes NRF habitat, would be 46.7% (1804 acres), a net loss of 42 acres. This would have a negative impact on spotted owl habitat.

Alternative IV is within the incidental take, reasonable and prudent measures, terms and conditions, and conservation recommendations of the Biological Opinion issued by the USFWS (Willamette Province fiscal Year 1999, Habitat Modification Biological Assessment (BA) for Effect to Listed Species).

The net effect of the Alternative IV in 10 years versus no treatment would be 9 acres less NRF habitat and 33 acres more dispersal habitat. The dispersal corridor would remain intact.

The results of each alternative on NRF or dispersal habitat are shown in the Table 3-13.

Table 3-13 NRF or Dispersal Habitat In the Juncrock Planning Area

	NRF Acres	Dispersal Acres	Total %	Non Habitat
Existing Condition	1565 acres (40.5%)	281 acres (7.3%)	47.8%	2019 acres (52.2%)
Alternative I	1508 acres (39%)	272 acres (7.3%)	46.3%	2085 acres (53.7%)
Alternative II	1480 acres (38.3%)	281 acres (7.3%)	45.6%	2104 acres (54.4%)
Alternative III	1384 acres (35.8%)	248 acres (6.4%)	42.2%	2233 acres (57.8%)
Alternative IV	1499 acres (38.7)	305 acres (7.9%)	46.6%	2061 acres (53.4%)

These are estimates 10 years after treatment.

Direct and Indirect Effects Common to Alternatives II, III & IV:

The cutting of trees and hauling of logs during the breeding season would disturb spotted owls. A seasonal operating restriction of March 1 through July 15 would apply to those units within 0.25 miles of Late Successional Reserves 2156, 2161, and 2037 (Units 1, 8, 10, and 23).

Cumulative Effects:
The cumulative effects analysis includes the area bordered on the south by the Confederated Tribes of Warm Springs (CTWS) reservation boundary; the Mt. Hood NF boundary line on the east, the White River LSR on the north and FDR 43 is the western boundary. This area includes

the Clear, Camas, Hilynx, Diablo and Juncrock Planning Areas in which all or portions of these planning areas are contained within an Area of Concern (AOC). The White River LSR Plan identified the AOC for dispersing owls. The southern two thirds of the Juncrock Planning Area is within this AOC (see Map 10). The White River LSR is not included in the analysis because it is considered as fully functioning dispersal habitat. The goal for dispersal habitat is a minimum of 50% of an area. The older plantations (10-20 years old) were not considered, as they would not grow into dispersal habitat within 10 years.

The Juncrock Planning Area would have between 42% and 48% dispersal habitat remaining depending on the alternative selected. The activities in the Diablo Planning Area would result in approximately 60% dispersal habitat remaining. The activities in the Hilynx Planning Area would result in approximately 53% dispersal habitat remaining. Clear and Camas Planning Areas have approximately 64% dispersal habitat. All the surrounding planning areas have sufficient (above 50%) dispersal habitat. The Juncrock Planning Area becomes a critical link within the AOC as this planning area falls between the Hilynx and Diablo Planning Areas. The Clear and Frog Creek drainages would function as dispersal corridors through the Juncrock Planning area, connecting the Hilynx and Diablo Planning areas. These two dispersal corridors would continue to function for the next 10-20 years, at which time the older plantations start to become dispersal habitat (adding approximately 15-20% to the Planning Area).

The removal of NRF habitat within the Juncrock Planning Area is covered within the US Fish and Wildlife Service's (USFWS) Biological Opinion (1999 Habitat Modification Projects for the Willamette Province – file name: 98F381.wpd). The conclusion by USFWS is that these projects are not likely to jeopardize the continued existence of the spotted owl or result in the destruction or adverse modification of spotted owl critical habitat.

The CTWS bordering the southern edge of this analysis area may not have adequate dispersal routes to the south through the reservation. The riparian areas within the Reservation may be the only long-term travel corridors for owls. Owls dispersing into the Reservation may be exposed to higher levels of predation when trying to disperse to the south through tribal land.

3.4.8 Effects on R6 Sensitive Species:

Oregon slender salamander:

Direct and Indirect Effects of Alternative I:

There would be no planned activities. Natural processes would continue. The habitat would remain suitable.

Direct and Indirect Effects of Alternative II:

Cutting trees would reduce canopy closure to potentially unsuitable levels on about 75% of Units 1, 2, 3, 10, 11, 13, 14, 17, and 20 (122 acres); and on about 25% of Units 4, 6, 7, 12, and 16 (20 acres). After 20 to 40 years there would be sufficient canopy closure to provide for the needs of the Oregon slender salamander. The remaining acres within the above stands and all other treated acres would retain the characteristics of suitable habitat post treatment.

Direct and Indirect Effects Alternative III:
Cutting trees would reduce canopy closure to unsuitable levels on virtually 100% of Units 1, 2, 3, 4, 6, 7, 8-1, 9, 10, 11, 12, 13, 14, 17, 20, and 23 (289 acres) in the short run. However, within 30 to 40 years even those acres would have sufficient canopy closure to provide for the needs of the Oregon slender salamander. The remaining treated acres would retain all the characteristics of suitable habitat post treatment.

Direct and Indirect Effects of Alternative IV:
Cutting trees would reduce canopy closure to potentially unsuitable levels on about 75% of Units 10 and 13 (13 acres); and on about 25% of Units 1, 2, 3, 4, 11, 14, 17, and 20 (42 acres). After 20 to 40 years there would be sufficient canopy closure to provide for the needs of the Oregon slender salamander. The remaining acres within the above stands and all other treated acres would retain the characteristics of suitable habitat post treatment.

Cutting trees would reduce canopy closure. Building new roads and landings would remove both canopy and down wood habitat. Machine grapple piling and pile burning would remove down wood habitat. Skidding logs would remove or move down wood habitat within the skid trails.

Sufficient large down woody material (minimum of 240 linear feet per acre) would be left in all harvest units to provide potential habitat. Four snags/acre (or live wildlife trees in the absence of snags) would be left for future down wood. Sufficient green tree replacements would be left for future snags in all harvest units.

Cumulative Effects:
The cumulative effect analysis area is the planning area. The planning area would have enough habitats with any alternative to allow the continued existence of this species.

Pacific fringe-tailed bat:
Direct and Indirect Effects of Alternative I:
There would be no planned activities. Natural processes would continue. The habitat would remain suitable. The tree mortality would increase the number of snags for this species thus increasing the number of potential roost trees. The riparian foraging areas would remain unchanged.

Direct and Indirect Alternatives II, III, & IV:
About 14 acres of potentially suitable riparian habitat would be entered with the proposed activities in any of the action alternatives. The habitat may be degraded but would remain suitable. A minimum of four snags per acre (or live wildlife trees in the absence of snags) would be left in all treatment units.

Cumulative Effects:
The cumulative effect analysis area is the planning area. The planning area would have enough habitats with any alternative to allow the continued existence of this species.

Wolverine
Direct and Indirect Effects of Alternative I:
This alternative would not change open road densities or snowmobile use. No habitat would be removed with this alternative.

Direct and Indirect Effects of Alternatives II, III, & IV:
Closing roads in these alternatives would have a positive impact on wolverines by reducing road densities. Habitat for prey species (or carrion) would not be impacted by the proposed activities.

Cumulative Effects:
The cumulative effects analysis includes the area bordered on the south by the Confederated Tribes of Warm Springs reservation boundary, the summer range boundary line on the east, the White River LSR on the north and the west edge of the Bear Knoll Planning Area forming the western boundary. This area includes the Bear knoll, Hilynx, Diablo, Clear, Camas, and Juncrock Planning Areas.

Open road densities are decreasing across the analysis area. Open road densities are planned for reduction in the action alternatives of Bear Knoll. Cumulatively, reduced human presence would reduce harassment to wolverines.

Pacific fisher:
Direct and Indirect Effects of Alternative I
There would be no planned activities. Natural processes would continue. The habitat would remain suitable. The tree mortality would increase the number of snags for this species thus increasing the number of potential natal den sites.

Direct and Indirect Effects of Alternative II:
Cutting trees would modify 426 acres of denning and 124 acres of foraging habitat. Post treatment, 370 acres would remain denning habitat and 106 acres of foraging habitat, with a net loss of 56 acres of denning and 18 acres of foraging habitat.

Direct and Indirect Effects of Alternative III:
The effects would be similar to Alternative II except, post treatment 239 acres would remain denning habitat and 73 acres of foraging habitat, with a net loss of 187 acres of denning habitat and 51 acres of foraging habitat.

Direct and Indirect Effects of Alternative IV:
Cutting trees would modify 426 acres of potential denning and 124 acres of foraging suitable habitat. Twenty acres of potential foraging habitat would be lost.

Direct and Indirect Effects Common to Alternative II, III & IV:
Cutting trees would reduce canopy closure. Building new roads and landings would remove both canopy and down wood habitat. Machine grapple piling and pile burning would remove down wood habitat. Skidding logs would remove or move down wood habitat within the skid trails.

There are 1015 acres (30 percent of the planning area) of denning and foraging habitat within the planning area that would not be entered.

Within ten years, all treated acres should exhibit sufficient canopy closure that would allow year around foraging. At least three large diameter snags per acre (or live wildlife trees in the absence of snags) and a minimum of 240 linear feet/acre of down wood would be retained. In addition, 30% of the planning area would be retained in untreated condition, retaining all of the snags and other existing characteristics that are expected in fully functioning late successional stands.

Cumulative Effects:
The cumulative effects analysis area is the White River 5th field watershed.

Cumulatively, about 68% of the watershed would remain in late successional habitat, which is adequate for this species.

3.4.9 Effects on Survey and Manage Species:

Columbia oregonium:
Direct and Indirect Effects of Alternative I:
The four sites found would not be affected because there are no harvest activities.

Direct and Indirect Effects of Alternatives II, III, & IV:
All four locations of Columbia oregonium found in the Juncrock planning area would be protected, so there would be no effect to the sites.

3.4.10 Effects on Mt. Hood National Forest Management Indicator Species

Deer & Elk:
Direct and Indirect Effects of Alternative I:
Trees would not be harvested. The proportions of thermal, optimal, or hiding cover; or forage would not change. Fawning and calving habitat is concentrated in and near the riparian reserves and would remain unchanged.

No roads would be closed or built; therefore the open road density would remain unchanged. A portion of roads closed with guard rails have not been effective. These roads may continue to be breeched.

Direct and Indirect Effects of Alternative II:
Cutting trees, building roads and landings would reduce canopy closure. Approximately 300 acres of thermal cover would be lost. Optimal cover would increase by about 140 acres. The planning area would contain 40% thermal cover and 19% optimal cover which exceeds the standards and guides of at least 15% thermal and 15% optimal cover (MHNF S&G FW-206). After the project there would be adequate thermal cover for big game.
Cutting trees and building landings would create about 280 acres of foraging habitat. This would result in approximately 480 total acres of foraging habitat (12%), which is short of the recommended 20% for summer range. Forage would improve by 6% within the planning area.

Fawning and calving habitat is mostly concentrated in and near the riparian reserves, which are largely avoided.

A total of 10.94 miles of the 32.08 miles of roads used to calculate wildlife road density would be closed. Some previous road closures have been ineffective. Open road density would be reduced from 5.13 miles/mile^2 to 3.46 miles/mile^2.

Open road/trail density for motorized use on the McCubbins Gulch OHV trail area (7.87 open miles, 1.04 miles^2) would go from 8.38 miles/mile^2 to 7.57 miles/mile^2. This would still exceed the summer open road density standard of 2.5 miles/mile^2, however the McCubbin's Gulch OHV Plan recognized that road densities would never meet these standards within the OHV Area.

The area outside the OHV trail area (20.89 open miles, 5.00 miles^2) would go from 4.45 miles/mile^2 to 2.60 miles/mile^2, which would be above the Forest Plan standard of 2.5 miles/mile^2 but moving towards the standard.

Direct and Indirect Effects of Alternative III:
Cutting trees, building roads and landings would reduce canopy closure. Approximately 370 acres of thermal cover and 10 acres of optimal cover would be lost. The planning area would contain 38% thermal cover and 18% optimal cover, which exceeds the standards and guides. After the project there would be adequate thermal cover for big game.
Cutting trees and building landings would create about 290 acres of foraging habitat. This would result in approximately 490 acres of foraging habitat (13%), which is short of the recommended 20% for summer range. Fawning and calving habitat is concentrated in and near the riparian reserves, which are largely avoided. Forage would improve by 7% in the planning area. Total miles of open road, motorized trails, and miles of road closure are the same as Alternative II.

Direct and Indirect Effects of Alternative IV:
Cutting trees, building roads and landings would reduce canopy closure. Approximately 270 acres of thermal cover would be lost. Optimal cover would increase by about 220 acres. The planning area would contain 41% thermal cover and 24% optimal cover, which exceed standards and guides. After the project there would be adequate thermal cover for big game.

Cutting trees and building landings would create about 190 acres of foraging habitat. This would result in approximately 390 acres of foraging habitat (11%), which is short of the recommended 20% for summer range. Forage would improve by 5% within the planning area. Fawning and calving habitat is concentrated in and near the riparian reserves, which are largely avoided.

Total miles of open road, motorized trails, and miles of road closure are the same as Alternative II.

Cumulative Effects:
The cumulative effects analysis includes the area bordered on the south by the Confederated Tribes of Warm Springs (CTWS) reservation boundary, the summer range boundary line on the east, the White River LSR on the north and the west edge of the Bear Knoll Planning Area forming the western boundary. This area includes the Bear knoll, Hilynx, Diablo, Camas, Clear,

and Juncrock planning areas. The Bear Knoll and Juncrock areas are in the planning stages. The Diablo and Hilynx areas are in the implementation stage. Camas and Clear are not scheduled for planning.

Assumptions made: A trend of reduced forage habitat on summer range because of fewer regeneration harvest units within the last 10 years; White River is a physical boundary on the north side of this analysis area; harvest activities on CTWS land will create forage over the foreseeable future; road densities are decreasing toward 2.5 miles/mile^2 on summer range MHNF S&Gs FW-209.

Forage within the Juncrock planning area would range between 6% for the no action Alternative and 13% for Alternative III. The Hilynx planning area will have 34% forage remaining post harvest. The Diablo planning area will have 35% forage post harvest. The Bear Knoll planning area currently has 3% forage, with a potential to increase the amount depending on the alternative selected. The Camas and Clear planning areas currently have 4% forage. The optimum habitat for deer and elk is 60% forage and 40% cover of proper size and distribution (Wildlife Habitats in Managed Forests, Thomas et al, 1979). A goal for planning is to have 20% of a planning area in forage through time for summer range. Forage is below planning goals in the Juncrock, Bear Knoll, Clear and Camas areas and above goals in the Diablo and Hilynx Areas. The CTWS land is also expected to supply adequate forage over the next ten years. Deer and elk using this summer range area will have adequate forage opportunities for the next ten years, however forage may not be distributed evenly across the landscape.

The open road density for Juncrock is currently 5.13 miles/mile^2 and reduced to 3.46 miles/mile^2 within the entire planning area. For all action alternatives the open road density would be 2.6 miles/mile^2 outside the OHV area. The Hilynx area would reduce road densities from 5.41 miles/mile^2 to 2.16 miles/mile^2. The Diablo area would reduce road densities from 3.09 miles/mile^2 to 2.4 miles/mile^2. The Bear Knoll area currently has 4 miles/mile^2 of open roads with the action alternatives reducing this density. The Camas and Clear planning areas currently have 4.98 miles/mile^2 of open roads. Open road densities are being reduced in the Hilynx and Diablo Planning Areas. Open road densities are reduced in the action alternatives of Juncrock and Bear Knoll. Open road densities are being reduced in all planning areas. Closing roads would reduce wildlife harassment and improve utilization of the habitat.

Pine Marten and Pileated Woodpecker Habitat Areas:

Direct and Indirect Effects of Alternative I:

Pileated woodpecker habitat area #2011W would not be impacted by this alternative. No habitat would be removed.

Direct and Indirect Effects of Alternative II, III & IV:

Pileated woodpecker habitat area #2011W would be impacted by units 11 (21 acres) and 23 (1 acre). A contiguous mature and/or old growth core area of 714 acres has been established within the Camas planning area. A pine martin area, #2151M has 286 acres of core area. Both areas are above MHFP S&G's for established core areas. The MHFP B5-018 states that regulated timber harvest should occur where B5 Management Areas are inclusions within B and C Category Management Areas. MHFP B5-020 and 021 state that commercial thinning may occur

within the non-mature habitat component, i.e. less than 100 years of age. Crown closure within the forest canopy shall be at least 50% within commercial thinning activity areas. These units within Juncrock would meet these standards.

Cumulative Effects**:**

The cumulative effects analysis includes the area bordered on the south by the Confederated Tribes of Warm Springs (CTWS) reservation boundary, the Mt. Hood NF boundary line on the east, the White River LSR on the north and FDR 43 is the western boundary. This area includes the Clear, Camas, Hilynx, Diablo and Juncrock Planning Areas in which all or portions of these planning areas are contained within an Area of Concern (AOC). The White River LSR Plan identified the AOC for dispersing owls. The southern two thirds of the Juncrock Planning Area is within this AOC (see Map 10). The White River LSR is not included in the analysis because it is considered as fully functioning dispersal habitat. The goal for dispersal habitat is a minimum of 50% of an area. The older plantations (10-20 years old) were not considered, as they would not grow into dispersal habitat within 10 years.

See spotted owl cumulative effects section for discussion on the dispersal corridor. These pine marten and Pileated habitat areas, 100 acre LSR's and LSR's are part of the mature and old growth species habitat net work for the Mt. Hood National Forest.

Snag and Down Log Associated Species:

Direct and Indirect Effects of Alternative I:

There would be no planned activities. Natural processes would continue. The habitat would remain suitable. Tree mortality would increase the number of snags for down log and snag associated species. This would increase the biological potential in areas under 100% and be excess to those species in areas already at 100%.

Tree diseases such as Indian Paint Fungus may be beneficial to cavity nesting species. Indian Paint Fungus promotes heart rot which cavity nesting species use to create cavities in diseased trees. Diseased trees would supply long term habitat for the cavity dependent species in the planning area.

Direct and Indirect Effects of Alternative II & IV:

The silvicultural prescriptions for Alternatives II and IV are the same; Individual Tree Selection, with varying percentages of regeneration. With this prescription, four wildlife trees per acre would be identified, providing potential snags and down wood. Alternative IV has an upper diameter limit of 21 " DBH, so the opportunity for additional snags and down wood through time is greater.

Direct and Indirect Effects of Alternative III

Alternative III's silvicultural prescription for all units except 5, 15, 15R, 18, 18R 21, and 21R (thinning units) would be to leave a minimum of 18 trees/acre, 9 of the leave trees with some disease or insects (unhealthy or poor form) and the other 9 healthy trees. Units 15, 15R, 18, 18R, 21, and 21R would have some diseased trees remain as leave trees. Wildlife trees would marked if sufficient snags are not available. Grand fir and western hemlock are the most likely tree

species in this area to have Indian Paint Fungus (Bull et al, 1997, GTR 391). These diseased trees would supply future long-term habitat for cavity dependant species within this planning area.

The DecAID Advisor was used to re-determine the number of snags per acre to be identified for snag and down logs.

DecAID Advisor – DecAID is a planning tool intended to help advise and guide managers as they conserve and manage snags, partially dead trees and down wood for biodiversity (Mellen et. al. 2003). Refer to this web site for more detail and for definition of terms. This advisory tool focuses on several key themes prevalent in recent literature concerning this subject and are as follows:

Important decayed wood elements consist of snags, down wood and live trees with dead tops or stem decay.

Decayed wood provides habitat and resources for a wide array of organisms and their ecological functions.

Wood decay is an ecological process important to many organisms.

The DecAID tool provides information on the array of key ecological functions and functional groups of wildlife that use snags and down wood, and can be used to describe the effect of changing snag and down wood levels on those functions and functional groups. This tool is not a wildlife population simulator nor is it an analysis of wildlife population viability.

A critical consideration in the use and interpretation of the DecAID tool is that of scales of space and time. DecAID is best applied at scales of subwatersheds, watersheds, subbasins, physiographic provinces, or large administrative units such as Ranger Districts or National Forests. DecAID is not intended to predict occurrence of wildlife at the scale of individual forest stands or specific locations. It is intended to be a broader planning aid not a species of stand specific prediction tool

The Juncrock Planning Area falls into the "Eastside Mixed Conifer Forest, East Cascades/Blue Mountains, Small/Medium Trees Vegetation Condition" as described in the DecAID tool.

The snag densities of 30, 50, and 80 percent levels are extrapolated from limited wildlife data. This is the best data available. The 30 percent tolerance level has 6.7 snags/acre greater than 10", of which 2.7/acre are greater than 19.7 inches DBH. The 50 percent tolerance level has 12.5 snags/acre greater than 10 inches, of which 4.2 /acre are greater than 19.7 inches DBH. The 80 percent tolerance level has 25 snags/acre greater than 10 inches, of which 8.5/acres are greater than 19.7 inches DBH.

According to the White River LSR plan, this planning area falls mainly within the Transition Zone and some of the planning area lies within the Crest Zone. This planning area is then capable of producing 4-10 snags/acre greater than 16 inches DBH. This coincides mainly with the 30 percent tolerance level in the DecAID tool and some of the area capable of the 50 percent tolerance level.

Snag densities in central Oregon averaged 4 snags/acre greater than 10" DBH of which 60 percent were larger than 20 inches DBH (Bullet al, 1997, GTR-390).

All harvest activities would reduce the number of snags and down logs. A minimum of 4 snags per acre (or live wildlife trees in the absence of snags) and a minimum of 240 linear feet of down logs per acre greater than 20 inches in diameter would remain in all alternatives. This would assure 100% biological potential for snag dependent species within the harvested areas and is consistent with the above tools and research information.

Neotropical Migratory Birds:

Direct and Indirect Effects of Alternative I:

There would be no planned activities. The percentage of existing structure types that these birds depend on would change very little and thus the species mix and populations are expected to change very little. All neotropical species associated with these habitats are assumed to be present. Approximately 22% (850 acres) of the area should support late seral dependent species such as hermit thrush. About 40% of the late seral acres are riparian reserves commonly containing a mix of conifer and hardwood vegetation potentially suitable for species such as red-breasted sapsuckers. About 49% (1894 acres) should support mid-seral dependent species such as Cooper's hawk, and 29% (1121 acres) should support early seral dependent species such as olive-sided flycatchers and red-tailed hawk. The Oregon-Washington Partners In Flight group has produced a Conservation Plan for the east slope of the Cascades in Oregon and Washington (Conservation Strategy For Landbirds Of The East-Slope Of The Cascade Mountains In Oregon And Washington, Altman 2000). This strategy identified the mixed conifer (late-successional) habitat as a priority habitat type that occurs in this planning area.

Direct and Indirect Effects of Alternative II:

Cutting trees, building roads, and landings would reduce canopy closure. The habitat for the early seral dependent species increases by 6% all of which is the open multistory and open parklike structure types. A gain of about 232 acres of early seral dependent species habitat would result in about 1353 acres (35%) of the area capable of supporting such species as olive-sided flycatchers and red-tailed hawk. The olive-sided flycatcher is a focal species in the East-Slope Conservation Strategy. The increase in habitat would help this species.

The mid-seral dependent species habitat would decrease to 1662 acres (43%) capable of supporting species such as Cooper's hawk. This alternative would decrease the amount of habitat and consequently the number of birds. This habitat type was not identified as priority habitat in the East-Slope Conservation Strategy as this habitat type was not limited throughout Oregon and Washington.

The late-seral dependent species habitat would stay at 850 acres (22%) capable of supporting species such as hermit thrush. About 40% of the late seral acres are riparian reserves containing a mix of conifer and hardwood vegetation suitable for species such as red-breasted sapsuckers. The East-Slope Conservation Strategy identified the mixed conifer (late-successional) habitat as a priority habitat type. A Strategy Objective is to have “no net loss” of habitat. The hermit thrush is a focal species for this habitat type and would remain constant with this alternative as no net loss of habitat would occur.

Direct and Indirect Effects of Alternative III:
Cutting trees, building roads, and landings would reduce canopy closure. The habitat for the early seral dependent species increases by 8% all of which is the stand initiation structure type. A gain of about 303 acres of early seral dependent species habitat would result in about 1430 acres (37%) of the area capable of supporting such species as olive-sided flycatchers and red-tailed hawk. The olive-sided flycatcher is a focal species in the East-Slope Conservation Strategy. The increase in habitat would help this species.

The mid-seral dependent species habitat would decrease to 1662 acres (43%) capable of supporting species such as Cooper's hawk. This alternative would decrease the amount of habitat and consequently the number of birds. This habitat type was not identified as priority habitat in the East-Slope Conservation Strategy as this habitat type was not limited throughout Oregon and Washington.

The late-seral dependent species habitat would decrease by 77 acres to 773 acres (20%) capable of supporting species such as such species as hermit thrush. About 40% of the late seral acres are riparian reserves containing a mix of conifer and hardwood vegetation suitable for species such as red-breasted sapsuckers. The East-Slope Coservation Strategy identified the mixed conifer (late-successional) habitat as a priority habitat type. A Strategy Objective is to have “no net loss” of habitat. The hermit thrush is a focal species for this habitat type and would be reduced with this alternative as a net loss of habitat would occur.

Direct and Indirect Effects of Alternative IV:
Cutting trees, building roads, and landings would reduce canopy closure. The habitat for the early seral dependent species increases by 4% all of which is the open multistory and open parklike structure types. A gain of about 163 acres of early seral dependent species habitat would result in about 1275 acres (33%) of the area capable of supporting such species as olive-sided flycatchers and red-tailed hawk. The olive-sided flycatcher is a focal species in the East-Slope Conservation Strategy. The increase in habitat would help this species.
The mid-seral dependent species habitat would decrease to 1662 acres (43%) capable of supporting species such as Cooper's hawk. This alternative would decrease the amount of habitat and consequently the number of birds. This habitat type was not identified as priority habitat in the East-Slope Conservation Strategy as this habitat type was not limited throughout Oregon and Washington.

The late-seral dependent species habitat would increase by 78 acres to 928 acres (24%) capable of supporting species such as such species as hermit thrush. About 40% of the late seral acres are riparian reserves containing a mix of conifer and hardwood vegetation suitable for species such as red-breasted sapsuckers. The East-Slope Conservation Strategy identified the mixed conifer (late-successional) habitat as a priority habitat type. A Strategy Objective is to have “no net loss” of habitat. The hermit thrush is a focal species for this habitat type and would benefit from the increase in habitat.

Cumulative Effects:
The cumulative effects analysis includes the area bordered on the south by the Confederated Tribes of Warm Springs reservation boundary, the east edge of the Diablo planning Area

forming the east boundary, the White River LSR on the north and the west edge of the Bear Knoll Planning Area forming the western boundary. This area includes the Bear knoll, Hilynx, Diablo, Camas, Clear, and Juncrock planning areas. The Bear Knoll and Juncrock Areas are in the planning stages. The Diablo and Hilynx Areas are in the implementation stage. Camas and Clear are not scheduled for planning.

Assumptions made: The early seral structure types across the landscape would become limited within 10 years for those species. There is currently a limited amount of late seral structure types across the landscape. The mid seral structure types (close canopy) are more than adequate for those species.

Early seral habitat within the Juncrock planning area would range between 29% for the no action Alternative and a high of 37% for Alternative III. The Hilynx planning area will have 34% early seral remaining post harvest. The Diablo planning area will have 35% early seral post harvest. The Bear Knoll planning area currently has 25% early seral, with a potential to increase the amount depending on the alternative selected. The Camas and Clear planning areas currently have 36% early seral. The early seral habitat does not appear to be limited in any of the planning areas. The CTWS land is also expected to supply early seral habitat over the next twenty to forty years. Early seral species using this area would have adequate habitat for the next twenty to forty years, however habitat may not be distributed evenly across the landscape.

Open late seral habitat within the Juncrock planning area would range between 21% for the no action Alternative and 24% for Alternative IV. The Hilynx planning area would have 41% late seral remaining post harvest. The Diablo planning area would have 25% late seral post harvest. The Bear Knoll planning area currently has 41% late seral, with a potential to decrease the amount depending on the alternative selected. Late seral habitat appears to be adequate to support these species.

3.5 Hydrology

Existing Condition

The Juncrock planning area (3,865 acres) is within two 5th field Watersheds; White River and Beaver Creek, 94% and 6% of the planning area respectively. The White River is designated as a tier 2 Key Watershed under the NWFP. Beaver Creek is not a key watershed and falls under the direction of matrix lands.

Within the planning area there is one 6th field watershed in the White River Watershed. The 6th field watershed, Clear Creek, is comprised of two drainages, Clear Creek and its tributary, Frog Creek. Clear Creek irrigation ditch, constructed in the early 1900's, bisects the area. This ditch is used to capture and convey water from both Clear and Frog Creeks to serve the Juniper Flat Improvement District. Timber harvest, grazing and water withdrawal have all contributed to Clear Creek's inclusion in Oregon's water quality limited streams list (303(d)) for temperature from the mouth to the headwaters.

Fine sediment in Frog Creek is above Forest Standards. Approximately 80% of Frog Creek is diverted through an irrigation ditch to Clear Creek. Frog Creek irrigation ditch dumps back into Clear Creek approximately 2.9 miles above the Juncrock planning area. At this point the Clear

Creek Ditch begins. Approximately 70% of stream flow from Clear Creek is diverted into the irrigation ditch with 100% flow diversion permitted. These perennial flowing ditches alter the bankfull (channel maintenance flows) discharge within both Clear and Frog Creeks. This reduces the seasonal flushing action inherent to mountain streams, leaving an accumulation of fine sediment in Frog Creek (Clear Creek riparian survey, 1990 and Rosgen, 1996).

Generally, riparian areas are late seral multi story structures and are in fair condition, with some stands going to poor condition. Riparian stands are composed of grand fir dying from overstocking, insects and disease, interrupting the connectivity between stands along the streams. Dwarf mistletoe is spreading from the mature trees into the younger regeneration, causing early mortality in what would become future riparian reserve trees. Some riparian reserve stands lack tree species diversity. Blow down has reduced canopy cover in some riparian areas. Skid trails from previous entries reduce infiltration of water and cause erosion.

An analysis of the White River Watershed during the 1995 WRWA showed that the Aggregate Recovery Percentage model (APR) was 70%. An ARP of 65% or less predicts adverse effects through time and space during a rain on snow event (MHFP FW-062).

In 1999, the ARP for the upper White River 5th field Watershed was calculated at 82%, and 76% for the Clear Creek 6th field watershed. No additional timber harvest has occurred in the Clear Creek 6th field watershed since the ARP model was last calculated.

Juncrock straddles portions of two 6th field watersheds in the Beaver Creek Watershed, Upper Beaver Creek and Middle Beaver Creek. The Beaver Creek Watershed lies primarily within the CTWS. Only 0.5% (240 acres) of the 45,406-acre Beaver Creek 5th field watershed is managed by the Forest Service and falls under the guidelines of the NWFP (ROD p.4). There are no riparian reserves located on this portion of the watershed; it is flat and has no drainages with signs of annual scour. The ARP was not calculated for this drainage due to limited information about management activities on the reservation. Instead, a predicted change in recovery was calculated which is based on the same principles of the ARP model.

Riparian Reserve widths are defined in the ROD (C30). There is a recommendation of 300 feet per side for perennial fish bearing creeks. Clear Creek and Frog Creek have 600' reserves. Intermittent non fish bearing streams have a recommendation of 100' reserve per side, based on the height of a site index tree. Consistent with these recommendations, riparian reserves were ground verified by the ID Team. Riparian reserves are being treated in units 1R, 2R, 13R, 14R, 15R, 16R, 18R and 21R.

Recommendations made by the WRWA were also followed, (WRWA pages 6-10 – 6-12). They include establishing a riparian reserve on any ditch that uses a natural channel and are fish bearing. Clear Creek Ditch has a reserve of 200 feet per side. Also followed is the recommendation of consolidating areas that have a high density of unmapped springs. Units 4, 8, 11, & 12, have riparian reserves identified to protect previously unknown springs. See Map 5 for riparian reserve locations.

Direct and Indirect Effects

Alternative I

No timber harvest would occur. Mature stands would continue to decline, causing a loss of canopy closure. Young tree growth would offset the loss in canopy closure. Aggregate Recovery Percentage (ARP) would not change. There would be no expected change in peak flow. There would be no change in water temperature in Clear Creek, Frog Creek, or the Clear Creek Ditch.

There would be no roads, landings, or skid trails built. Sediment run-off would not increase.

There would be no road closures. Sediment run-off would continue or increase.

Alternatives II, III, IV

The prescription of cutting trees in riparian areas is the same for all action alternatives, and the direct and indirect effects would be the same unless otherwise stated.

Harvesting trees, building roads, landings, or skid trails following Best Management Practices (BMP) and design features would cause a negligible increase in water temperature and sedimentation in Clear Creek ditch, Clear and Frog Creeks and their tributaries. The proposed harvest would not cause a change in Clear Creek's listing as a 303(d) stream.

Closing and improving drainage on 10.2 miles of road, including 4310011 are proposed for all action alternatives. These actions would reduce sedimentation in Clear Creek and its tributaries.

Cumulative Effects

The analysis area for cumulative effects is the two 5th field Watersheds; White River and Beaver Creek, including the 6th field watersheds, Clear Creek, and Upper and Middle Beaver Creeks.

Assumptions: Path, Diablo, Wildfire, the sales from the Hilynx planning area and future sales from the Bear Knoll area would go forward as planned. If the untreated or recovered vegetation condition were above 65% at the subwatershed analysis level there would be minimal cumulative effects. (MHFP S&G FW 061 to 064)

Alternative I

There would be no measurable change in the ARP value for the Clear Creek subdrainage or the recovery of the Beaver Creek subdrainage. Water temperature would remain at current levels. Sedimentation would continue at existing levels.

Alternative II

The ARP value for the Clear Creek subwatershed, currently 76%, would decrease by less than 1%, maintaining it well above the threshold of 65%. The predicted change in recovery in the Upper and Middle Beaver Creek subwatersheds would be a decline of less than 0.05%.

Stands in both subwatersheds would be more open in the short term, with a higher percentage of healthy trees maintaining a denser canopy closure through the long term. Water temperature would remain at current levels. Improvements to road drainage would decrease sedimentation.

Following design features and best management practices, sedimentation would not increase from current levels.

Alternative III
The ARP value for the Clear Creek subwatershed would decrease by 1-2%, maintaining it above the threshold of 65%. The predicted change in recovery in the Upper and Middle Beaver Creek subwatersheds would be a decline of about 0.2%.

Half of the stands proposed for treatment would be more open. Trees that are left would be the healthiest in the stand, maintaining a denser canopy closure in the long term. The remaining half of the stands would be relatively sparse, allowing more snow to reach the ground. Melting times would be shortened, with higher runoff peaks, which could increase sediment movement. Loss from insects, disease, or fire would be reduced, keeping canopy closure intact. Loss from windthrow would open the canopy further. Water temperature would remain at current levels. Improvements to road drainage would decrease sedimentation. Due to design features and best management practices being followed, sedimentation would not be expected to increase from current levels.

Alternative IV
The ARP value for the Clear Creek subwatershed would decrease by 1-2%, maintaining it above the threshold of 65%. The predicted change in recovery in the Upper and Middle Beaver Creek subwatersheds would decline about 0.1%. This predicted change is an estimate, based on the total acres in the subwatershed and the number of acres being treated by Juncrock.

Water temperature would be maintained at current levels. Following design features and best management practices, sedimentation would not increase from current levels.

3.6 Aquatic and Fisheries

Existing Condition

A complete Aquatics Biological Evaluation can be found in Appendix D. Table 3-14 displays aquatic species analyzed for the Juncrock planning area.

Table 3-14 Aquatic Species Analyzed for the Juncrock Planning Area EIS

Threatened Species	Suitable Habitat	Presence	Surveys
Mid-Columbia River Steelhead Trout (ESU)	N	N	Y
Columbia River Bull Trout (ESU)	N	N	Y
R6 Sensitive Species			
Coastal Cutthroat Trout	Y	N	Y
Interior Redband Trout	Y	Y	Y
Deschutes River Summer/Fall Chinook Salmon (ESU)	N	N	Y
R6 Survey and Manage Species			
Basalt Juga *Oreobasis spp.*	Y	N	Y
Columbia dusky snail *Lyogyrus spp.*	Y	Y	Y
Essential Fish Habitat			
Chinook and Coho	N	N	N/A

N/A = Not Apply

The Juncrock Planning Area (3,865 acres) is located within both the White River (3,625 acres) and Beaver Creek (240 acres) fifth field watersheds. White River has been identified within the NWFP as a Tier 2 Key Watershed where high quality water is important, but may not contain at-risk fish stocks, (NWFP, p. B-91). Beaver Creek under the NWFP (ROD, p. C-39) has been designated as a non-Key watershed.

Information on the Beaver Creek watershed is limited, as the majority of the watershed is managed by the Confederated Tribes of Warm Springs. The planning area in the Beaver Creek watershed is isolated to 240 acres of flat ridgeline with no riparian reserves present. Fish species present within the Beaver Creek watershed are: MCR summer steelhead trout *Oncorhynchus mykiss gairdneri*, Deschutes River summer chinook salmon *O. tshawytscha*, resident rainbow trout *O. mykiss spp.*, and pacific lamprey *Entosphenus tridentatus* (personal communication with P. O'toole, CTWS, 2002). The headwaters of an unnamed Indian Creek tributary (Middle Beaver Creek subwatershed) are located just outside of the Juncrock planning area.

White River originates from the White River Glacier located on the eastern flanks of Mt. Hood. Elevation in the watershed ranges from 6,525 feet to 800 feet. Precipitation ranges from 100 inches to 12 inches per year.

The White River Watershed starts to become segmented approximately one mile from its confluence with the Deschutes River by a series of three falls. The upper most falls, White River Falls, at RM 2.0, is impassable to all upstream fish migration. Below this point, MCR summer steelhead trout, MCR spring chinook salmon and bull trout, *Salvelinus confluentus,* have access. Above the falls, only resident native interior redband trout, *O. mykiss gairdneri,* sculpin *Cottus spp.*, resident non-native coastal rainbow trout, *O. mykiss iridius* (hatchery stocks), and brook trout, *S. fontinalis,* are present.

There are approximately 4.0 miles of perennial, fish bearing streams in the Juncrock planning area. The two primary streams are Clear Creek and Frog Creek. There is one unnamed tributary, which is fish bearing for approximately 500 feet upstream from the confluence of Frog Creek. Clear and Frog Creeks are moderate to small sized streams.
Large woody material is an important physical structure component to both quality and quantity of fish habitat within a stream system. The LWM creates complex habitat such as quality pools, hiding cover for fish, and retains substrates. The MHFP standard for LWM is 106 pieces per mile that are at least 35 feet long, and greater than 12 inches in diameter at the small end of the log (MHFP FW-094 and 095). Stream survey data from 1990 shows Clear Creek reaches 1 and 2 are located within the Juncrock planning area. Reach 2 is above the MHFP standard. Reach 1 is below standard. Stream survey data from 1997 shows Frog Creek, reach 1 and 2 are below the MHFP minimum standard for LWM.

Fish habitat conditions are considered good due to adequate amounts of brush and small sized woody debris in the main channel. This debris plays a vital role in defining the channel's characteristics, pool formation, and fish refuge during high flows.

Clear Creek supports the Clear Creek irrigation ditch system. This perennial fish bearing irrigation ditch flows into a natural fish bearing stream channel (McCubbins Gulch), which the MHFP mandates the forest to maintain a suitable water temperature for fish using the natural channel. The WRWA (p. 6-11) recommends giving Clear Creek irrigation ditch a riparian area land allocation. The intention is to manage the ditch as a water transmission corridor. It is not intended to prohibit maintenance. The LWM within the ditch is undesirable due to high maintenance costs. Future recruitment of LWM within the ditch is also undesirable.

There is no fish screen at the headgate. Exceptions to fish screening of water diversions has not been given to the Clear Creek irrigation ditch system. Therefore it is not in accordance with the Oregon Revised Statute 509.615.

About 80% of Frog Creek is diverted through an irrigation ditch to Clear Creek. Frog Creek irrigation ditch dumps back into Clear Creek approximately 2.9 miles above the Juncrock planning area. At this point the Clear Creek Ditch begins. Approximately 70% of stream flow from Clear Creek is diverted into the irrigation ditch with 100% flow diversion permitted. These perennial flowing ditches alter the bankfull (channel maintenance flows) discharge within both Clear and Frog Creeks. This may impact fish spawning and foraging habitat by reducing seasonal flushing of fine sediment through the system, which is inherent to mountain streams (Clear Creek riparian survey, 1990 and Rosgen, 1996). Review Table 11 of existing conditions and LRMP standards for fine sediment levels in both Clear and Frog Creeks, (Appendix D, Aquatic BE, p. 18).

Interior redband trout throughout the Oregon interior basins, are well known to be hereditary resilient to high water temperatures (Behnke R., 1992). Interior redband trout have been found in water temperatures over 28 ^{o}C (Behnke R., 1992). Interior redband trout spawn in Clear Creek and Frog Creek during the latter half of April. Fry are believed to leave the gravel in late June, depending on water temperatures.

As of 1998, the Oregon Department of Environmental Quality (ODEQ) has placed Clear Creek (RM 0 to 15.1) and White River (RM 0 to 12) on the 303(d) list for water temperature. However, the 7 day running average did not exceeded ODEQ standards from 1996 through 2003 at either of the two data collecting sites located in Clear Creek during the spawning or incubation period. Frog Creek is the largest tributary to Clear Creek and currently meets Oregon state water quality standards. McCubbins Gulch (a natural stream channel, fed with 100% of Clear Creek ditch water) is managed to meet Oregon state water quality standards for water temperature, only. Water temperature data in McCubbins Gulch has been recorded for three years (2001-2003). A summer drought was experienced in 2001 and an extremely low snow pack was experienced in 2003, while 2002 was considered to have a normal water year. Water temperature met ODEQ standards in 2001 by exceeding 17.8 ^{o}C for only 6 consecutive days in 2001 and 0 days in 2002. In 2003, water temperature did exceed ODEQ standards for 14 consecutive days. Review Table 3-15 for additional information.

Table 3-15. Stream Temperature Summary									
Stream	**Location**	**Days over Max (7 day Average >17.8 ^{o} C)**							
		96	**97**	**98**	**99**	**00**	**01**	**02**	**03**
Clear Creek	**Above confluence of Camas Creek**	**-**	**-**	**0**	**0**	**-**	**-**	**-**	**-**
Clear Creek	**At Keeps Mills Campground**	**0**	**0**	**0**	**0**	**-**	**0**	**0**	**0**
Frog Creek	**At confluence of Frog Creek**	**-**	**0**	**-**	**-**	**-**	**-**	**-**	**0**
McCubbins Gulch	**About 1.75 miles upstream of McCubbins Gulch Campground**	**-**	**-**	**-**	**-**	**-**	**6**	**0**	**14**
Clear Creek Ditch	**In Clear Creek Ditch just below the headgate diversion**	**-**	**-**	**-**	**-**	**-**	**0**	**0**	**0**

0 = No days over 17.8
- = No data available

The interdisciplinary team selected BMPs and Design Features for this project. BMP selection is dictated by water quality objectives, soils, topography, geology and land form, channel morphology, vegetation, climate, economics, or institutional constraints. BMPs for this project can be found in Chapter II, pages 31-33.

3.6.1 Threatened Species

Mid-Columbia River Steelhead trout (listed 3/25/99)
Mid-Columbia River steelhead trout are not present within the planning area, but are present approximately 17 miles downstream below White River Falls. There is no historical or present evidence that steelhead have ever existed above White River Falls.

Mid-Columbia River summer steelhead are present within the Beaver Creek watershed, and have suitable spawning and rearing habitat in both Upper and Middle Beaver Creek subwatersheds. Spawning adults have been seen, and are believed to continually utilize the lower reaches of Indian Creek, which is on CTWS land and has potential habitat up to Bear Springs Meadow (personal communication with M. Weldon, CTWS, 2002). Data on fish distribution within the Upper Beaver Creek subwatershed is unavailable.

Columbia River Bull Trout (listed 6/10/98)
There is no evidence of Columbia River bull trout use in the planning area, above White River Falls or within Beaver Creek Watershed.

3.6.2 R6 Sensitive Aquatic Species

Interior Redband Trout
Presence of interior redband trout has been documented within the White River watershed and within the planning area. Units entering riparian reserves that are known to have redband trout present are: 1R, 13R, 15R, 16R, and 21R. Interior redband trout are known to be present up to the barrier located at Clear Creek Dam, approximately 7 miles upstream of the planning area. They are also in Frog Creek and its major tributaries, Clear Creek Irrigation ditch (entire length),

and one unnamed tributary located approximately 0.5 mile downstream of the Frog Creek Confluence to Clear Creek. Suitable rearing habitat is present in other unnamed intermittent tributaries to Clear Creek within the planning area. These tributaries maybe used by redband trout when water is present, during the winter and spring months. Review Map 8, for further detailed information on redband distribution within the Juncrock Planning Area.

There are resident rainbow trout within the Beaver Creek watershed. It is inconclusive if they are native interior redband trout or a hybrid stock between native interior redband trout and non-native coastal rainbow trout (hatchery stocks). Resident rainbow trout were documented up to approximately RM 2.5 and suspected up to RM 5.0 within Indian Creek of the Middle Beaver Creek subwatershed. Three juvenile fish barriers were identified within Indian Creek, all are culverts, and are on CTWS lands (personal communication with M. Weldon, CTWS, 2002).

Coastal Cutthroat Trout
There is no substantiated evidence that coastal cutthroat trout are present in the White River Watershed. There is suitable habitat in the planning area for coastal cutthroat trout.

Deschutes River Summer/Fall Chinook Salmon
Deschutes River Summer Chinook salmon have been documented in Beaver Creek watershed on CTWS lands. Chinook salmon are present within both Beaver Creek and Indian Creek drainages (RM 0.75) (personal communication with M. Weldon, CTWS, 2002).

3.6.3 R6 Survey and Manage Aquatic Mollusks

Columbia Dusky Snail and Basalt Juga Snail
Although the two aquatic mollusk species listed as "Survey and Manage": Basalt Juga *Oreobasis* spp.n. and the Columbia duskysnail *Lyogyrus* spp.are not R6 sensitive or federally listed as threatened or endanger, the MHNF does manage known sites. Surveys were conducted during 2000 and 2001 at multiple locations throughout the planning area. Habitat types that were surveyed included seeps and springs, small cold springs, and irrigation ditched. Only the Columbia duskysnail has been documented in the in the White River watershed including the planning area. Basalt Juga has not been found in any survey conducted on the MHNF. There are documented Columbia dusky snail populations located within 1/8 of a mile of Units 2, 2R, 8, 11, 14, 14R, 21, and 21R. The Columbia dusky snail was present in multiple habitat types such as springs, seeps, tributaries to Clear and Frog Creeks and the Clear Creek Ditch. See Map 8.

3.6.4 Essential Habitat

Chinook and Coho
Chinook and coho essential habitat (designated by NMFS) stops at White River Falls. No documented historical use of chinook or coho salmon is known to occur above the White River Falls. Chinook salmon are present within the Beaver Creek watershed; therefore, essential habitat is present up to the headwaters of Beaver Creek watershed.

Direct and Indirect Effects
Alternative I
There should be no short-term direct or indirect effects to aquatic habitat or individuals by implementing this alternative. There would be no soil disturbance because logging operations, road construction/closing, or prescribed fire activities would not occur. No riparian vegetation would be disturbed. The existing stream channel and aquatic habitat conditions should stay the same until the next high flow event occurs. Amounts of LWD throughout the planning area and fine sediment levels in Clear and Frog Creeks would still not meet MHFP standards and guidelines.
There should be no noticeable long-term effect to aquatic habitat or individuals by implementing this alternative. In the long-term there would be an increase in LWM, which would trend towards meeting standards and guidelines (MHFP S&G FW-094 and FW-095).

Alternatives II, III, and IV
Alternatives II, III, and IV have the same direct and indirect effects unless otherwise specified.

Building roads and landings, and skidding would have a negligible increase of fine sediment (<1mm in diameter) to fish spawning and rearing habitat, as well as to aquatic mollusk or their habitat. This is due to the riparian reserves acting as a sediment buffer between the activities and the stream channels.

Harvest of trees in the riparian reserves is designed to retain the desired amount of LWM (MHFP FW-092 and FW-135). Leaving additional down trees in both fish bearing (Unit 1R & Unit 11), and non-fish bearing streams (Units 2R and 14R), would increase the physical structure component to the stream channel and flood prone area depending on wood routing during periods of natural flooding. In Unit 14R, an additional 5 to 15 trees, (20 to 48 inches DBH) would come from diseased trees located at the outer edge (100 to 125 feet) of the riparian reserve. These trees would be girdled and allowed to fall naturally. In Unit 11, the portion of trees that fall down hill of FDR 2130 into the riparian reserve would be bucked and left. These additional trees would act as sediment buffers, provide additional riparian dependent wildlife habitat, and enhance stream channel complexity.

Cutting and removing trees in the riparian reserve along Clear Creek Irrigation Ditch, Units 13R, 15R, 16R, and 21R, causes no loss to the LWM. The ditch is not managed for LWM. It is managed for temperature only. Due to the management direction LWM within the ditch riparian reserve would be maintained at current levels.

Cutting trees in riparian reserves reduces tree canopy. Design layout and best management practices would retain adequate direct shade to the stream channels and Clear Creek irrigation ditch (professional opinion). There would be no short or long-term direct or indirect effects to water temperature, which would continue to meet DEQ standards for water temperature in both Clear and frog creeks, but may exceed ODEQ standards during poor water years (low snow pack or drought) in McCubbins Gulch.

Cumulative Effects
Cumulative effects were analyzed at two scales: the White River and Beaver Creek 5th field watersheds, which includes the Clear Creek, Upper and Middle Beaver Creek 6th field subwatersheds.

The assumptions for this analysis include: Water quality and quantity determines the abundance of aquatic biomass; leaving adequate LWM improves aquatic habitat; if there is good interior redband trout habitat then there is good aquatic mollusk habitat.

Riparian conditions at the 5th and 6th field watershed scales would be improved by treating the riparian stands. Large woody debris recruitment would be increased in both the short and long-term.

Water temperature at both the 5th and 6th field watershed scales would be maintained or decreased over time from leaving shade along natural stream channels and along the irrigation ditch. Oregon state water quality standards for water temperature would be met in the short and long-term. Maintaining cool water temperatures would maintain a healthy fish population, by keeping stress levels to a minimum.

Table 3-16 shows the specific findings for the action alternatives.

Table 3-16 Specific Findings For Alternatives I, II, III and IV

			Effect Determination			
Species	Species Present	Suitable Habitat Present	Alt. I	Alt. II	Alt. III	Alt. IV
Threatened Species						
Steelhead trout	No	No	NE	NE	NE	NE
Bull trout	No	No	NE	NE	NE	NE
R6 Sensitive Species						
Cutthroat trout	No	Yes	NI	NI	NI	NI
Interior Redband trout	Yes	Yes	NI	NI	NI	NI
Chinook salmon	No	No	NI	NI	NI	NI
R6 Survey and Manage Species						
Basalt Juga snail	No	Yes	NF	NF	NF	NF
Columbia Dusky snail	Yes	Yes	FS	FS	FS	FS
Essential Fish Habitat						
Chinook and Coho		No	NE	NE	NE	NE

NE = No Effect
NI = No Impact.
NF= None Found
FS= Found, Site protected

3.7 Consistency with ACS Objectives

The following table summarizes the complete document, "Consistency with ACS Objectives", which can be found in the Appendix.

This section assesses the consistency of the Juncrock planning area with the Aquatic Conservation Strategy at the White River fifth field watershed scale. Beaver Creek fifth field watershed and its two six field subwatersheds, Upper and Middle Beaver Creeks, will have minimum analysis done, due to the lack of information on existing conditions at both the fifth and sixth field watershed scale. Beaver Creek watershed is almost entirely located on Confederated Tribes of Warm Springs lands.

Alternative I represents the baseline conditions in the ACS analysis. Alternatives II, III, & IV reflect changes to the base line from the actions. Table 3-17 summarizes the ACS Objectives.

Table 3-17 Consistency with ACS Objectivities

ACS Objectives	Alternative I	Alternatives II, III & IV
1. Maintain & restore complexity of Watershed	Would maintain the distribution, diversity & complexity of watershed (C)	Would maintain & restore distribution & Complexity over time. (C)
2. Maintain & restore connectivity	Spatial & temporal connectivity would be maintained (C)	Would maintain spatial & temporal connectivity for Alt.s II & IV. (C), would degrade for Alt. III but still be consistent(C)
3. Maintain & restore physical integrity	Water quality would be maintained in natural stream courses, (C) Ditch could be compromised from blow down (NC)	Banks, shorelines and bottom configurations would be maintained. (C)
4. Maintain & restore water quality	Water quality would be maintained (C)	Water quality would be maintained. (C)
5. Maintain & restore sediment regime	Sediment regime would be maintained (C)	Maintain and improve sediment regime by reducing road mile densities. (C)
6. Maintain & restore in-stream flows	In-stream flows would be maintained (C)	Sediment, nutrient and wood routing would not be affected. (C)
7. Maintain & restore floodplains & watertables	Conditions of floodplains and watertables would be maintained (C)	Closed roads would increase drainage network function. (C)
8. Maintain & restore species composition & structural diversity	Species composition & structural diversity would be maintained (C)	Riparian reserve would encourage tree growth, and reduce competition. (C)
9. Maintain & restore habitat	Habitat would be maintained and restored (C)	Tree Canopy development would increase future LWM. (C)

(C)= Consistent with ACS Objectives
(NC)= Not consistent with ACS Objectives

3.8 Transportation System

Existing Condition

The Juncrock road system consists of 32.53 miles of system/classified Forest Development Roads, 3.6 miles of State Highway 216, and 2.68 miles of designated Off Highway Vehicle trails. A roads analysis or the Juncrock planning area has been completed. See the Appendix K for more information.

There are 3.35 miles of road currently closed with gates, guardrails or earth berms. There are examples of each type of road closure in the area. Generally, earth berms have been more effective road closures than gates or guardrails. FDR 2130280 is an example of a breeched guard rail closure. FDR 2130250 is an example of an effective road closure using berms.

Roads are asphalt, gravel, and native surface. Water generally drains down ditches to culverts or off the road by an outsloped road surface. In some places, water runs down the road, not draining as designed. The Clear Creek Irrigation Ditch Bridge, on FDR 2130 has a 13' width limitation. Leakage from the ditch keeps the subsurface of 2130 saturated year round. Culverts provide fish passage on Clear Creek and Frog Creek.

Limited road maintenance dollars have resulted in many roads brushing in, drainages becoming blocked, and road surfaces needing repair. Lack of past maintenance affects safety, road structure, and storm water run off. Roads brushing in reduce visibility for safe driving. Blocked drainages cause water to flow over the road, resulting in sediment entering creeks. Damaged road surfaces such as pot holes, ruts, washboards, breached water bars and pavement cracking, can be obstacles to drivers, add sediment into creeks, and increase the rate of degradation of the of the road infrastructure.

Oregon Hwy 216 crosses the planning area near the southern boundary. There is a Memorandum of Understanding (MOU) with ODOT regarding the issue of trees leaning over Highway 216. The Forest Service and ODOT identify and remove leaning trees that are considered an imminent safety hazard on a year round basis. Trees that are removed are placed in an agreed upon location and made available to the fire wood program.

Roads in the Juncrock Planning Area provide access for administrative, public, and commercial users. They access Clear Creek irrigation ditch, Clear Creek Campground, Rimrock trailhead, Rimrock pit, and a portion of McCubbins Gulch OHV trails and a day use area. Juncrock roads also provide access to power lines and two fiber optic cables. Many of the roads are used during winter for winter recreation, primarily snowmobile trails. Roads in Juncrock provide for timber haul and firewood removal.

FDR 2130 accesses two campgrounds and does not have adequate turnouts or shoulders to accommodate commercial and public traffic, resulting in a safety concern for mixed recreation and commercial use. There are unhealthy and/or leaning trees along this road in Unit 11. Two fiber optic lines are buried within the road prism. They adversely affect FDR 2130 due to inadequate compaction, causing the asphalt and shoulders to sink where it was backfilled.

Roads were analyzed for three different seasons of haul: wet operation season, normal operating season and dry operating season. Given the existing conditions and life expectancy of roads, wet season haul and normal season haul did not protect the integrity of existing roads. The roads in the Juncrock Planning Area were designed for hauling timber during the normal operating season, generally June through October (reference policy December 18, 1989 extended season haul policy). All action alternatives were analyzed for a dry season haul. Soil moisture in the subgrade must be below its plastic limit or less to meet this design parameter

Direct and Indirect Effect
Activities related to timber sales affecting the transportation system include: log haul, road construction, reconstruction, maintenance, road closures, access, and cutting unhealthy trees that lean over the road. These relationships/effects will be discussed for the no action and action alternatives.

Alternative I
The No Action alternative would not involve log hauling, road construction, road reconstruction, road closures, or timber sale related road maintenance. This alternative would not change the use pattern of roads, correct existing road erosion problems, or correct ineffective road closures. The MOU with ODOT, along Highway 216, would remain in effect and individual trees would continue to be removed as they are identified. These trees would continue to be available for the fire wood program.

Alternatives II, III, and IV
Log Haul has the most critical effect on the transportation resource. The amount of moisture present in the subgrade or base course is a concern. Past commercial haul during wet conditions of the base and subgrade have weakened the structural capacity of aggregate surfaced as well as asphalt surfaced roads. Even with normal traffic, road damage is likely to occur. With heavy vehicles, the damage would be accelerated.

Hauling during freeze/thaw conditions has damaged the surface and base materials. As frost penetrates the road prism, it pulls moisture up into the subgrade and base course material, saturating the subgrade. When the moisture in the subgrade and base course freezes, the ice expands, pushing soil and rock particles apart. This action reduces the compaction in the subgrade and base course, which in turn reduces the structural capacity of the road.

Plowing snow for winter haul eliminates insulation, which allows deeper frost penetration. Plowing also stores snow along the shoulders of the road. As the snow melts, the subgrade is saturated and prolongs the time it takes for the road to dry out in the spring.

All action alternatives would involve log haul. The main haul routes include 43, 4310 and 2130. Commercial haul would be prohibited when moisture is greater than the plastic limit in the subgrade and during freeze/thaw cycles, which would mitigate damage to road surfaces (dry operating season).

Commercial haul would be prohibited on FDR 2130 from Clear Creek Campground to the junction of FDR 2130250, which would mitigate conflicts between commercial haul and

recreational use of FDR 2130. Haul would also be limited to Monday through Friday on FDR 2130 from FDR 2130025 to Oregon Highway 216. These mitigation measures apply to all action alternatives.

Road maintenance would occur under all action alternatives. Maintenance would protect the road infrastructure, improve safety of the road, decrease sedimentation, help to protect fish and fish habitat, and reduce the spread of noxious weeds. Brushing roads increases sight distance to improve visibility for safe driving. Blading, ditch and culvert cleaning, rocking, spot rocking, resurfacing, removing and replacing barriers and water bars, corrects or improves water drainage. It may cause a temporary increase in sedimentation while the work is being done, but long term, would decrease the volume and velocity of water that carries sediment into creeks. Repairing road surfaces by blading, rocking, spot rocking, resurfacing, removing and replacing barriers and water bars, pavement patching and deep patching, would reduce obstacles, reduce maintenance costs, and protect the road infrastructure. Pre-locating ditch spoil and brush disposal locations would reduce the likelihood of spreading noxious weeds. Appropriate water sources would be selected for compacting and dust abatement that assure stream flow and fish protection measures are met. Maintenance activities could cause some short term delays or detours for road users while road work is being done.

Road construction and reconstruction are proposed for Alternatives II and III. Alternative II and III construct 0.80 miles and reconstruct 2.0 miles of road. Alternative IV reconstructs 0.3 miles. There would be no effects from construction, reconstruction, temporary roads or road closures as long as BMP's are followed. (General Water Quality Best Management Practices, USDA Pacific Northwest Region, November, 1988 R –1 through R – 23. There would be a temporary increase in access for all forest users until roads are closed at the end of the project

Road closures are proposed for all action alternatives (1.49 miles of road closures within the OHV area and 8.71 miles of road closures in the non-OHV area). In the past the district used gates, guardrails and earth berm closures. All three types of road closures are used in this planning area. Gates and guardrails have proven to be ineffective road closure devices. Earth berm closures have been the most effective and are the preferred method of road closure in all action alternatives. See Tables A-3 and A-4, in Appendix O. All action alternatives would result in the same amount of closed and open roads after all activities are implemented. Road closures would decrease access (public, administrative and commercial), decrease the current effective open road density, reduce existing road erosion problems, and reduce road maintenance costs. There would be fewer roads for public and administrative vehicle access for recreation, reforestation, managing fire and noxious weed control. Timing road closures with reforestation treatments would reduce the amount of time spent walking into areas for planting surveys. Removing berms to access roads for fires would take additional time and equipment. It would cost more to treat weeds if backpack sprayers are used instead of vehicles. Access behind closed roads would have the additional cost of reopening re-closing the road. The cost of maintaining a road that has been effectively barricaded and has self maintaining water drainages is less costly than keeping it open. The only cost would be monitoring for resource damage and the effectiveness of the closure.

Removing unhealthy, leaning trees along Oregon State Highway 216 and along FDR 2130 in Unit 11, is proposed for all action alternatives. It has been observed by ODOT and Forest Service personnel that thinned areas along the 216 corridor have shown a reduction in the number of trees that have fallen into the road way. The Forest Service and ODOT have worked closely together through the local maintenance division to identify and remove trees that could become a safety problem. This practice has been in place over 20 years in this corridor, and has proven very effective. Removing unhealthy trees would be in line with the MOU, reduces costs to the both the Forest Service and ODOT and complements this necessary maintenance requirement. These trees would be removed under these alternatives. Removing unhealthy, trees increases public safety and decreases damage to roads.

Cumulative Effects
The planning areas that share common haul routes define the spatial area for the cumulative effects analysis. Bear Knoll, Hilynx, and Juncrock share FDR 43, and Hilynx and Juncrock would share FDR 4310, and two segments of FDR 2130. Factors considered for cumulative effects on the transportation system include log haul, road construction, road closures, road density, road maintenance, and access.

Assumptions for this analysis include: Log haul would occur during the dry season. No log haul on FDR 2130 on weekends. No log haul on FDR 2130 from Clear Creek Campground to the junction of FDR 2130250. No haul over the bridge crossing the ditch on FDR 2130. All the timber sales from the above planning efforts would be completed in 10 years. All the other timber sales would protect the roads to standard.

Alternative I
Road use, access, and maintenance would be unchanged. Timber sales from the adjacent planting areas would continue independent of Juncrock.

Alternatives II, III, and IV
With the mitigation measure of dry season haul, there would be no unacceptable damage to roadbeds on haul routes. Removing leaning trees would increase public safety but would reduce the amount of wood available to the fire wood program.

3.9 Fire and Fuels

Existing Condition
Historically, the Juncrock planning area is considered a III B mixed severity fire regime, with a return interval from 50 to 100+ years, depending on a variety of factors (Mt. Hood National Forest Fire Management Plan (FMP)). The severity of a wildfire's effects is directly related to the amount of live and dead fuel on the ground, fuel moisture, weather conditions, and stand characteristics (species, height, density, structure, crown closure and crown ratios). The effects of mixed severity fires are variable with areas of low intensity ground fire, small groups of trees that burn and active crown fires with high tree mortality over short distances. Stand replacing independent running crown fires are possible given the right conditions.

The Juncrock planning area has had 19 wildfires in the past 40 years. Causes included lightning (8), smoking (6), equipment use (2), campfires (2), and arson (1). All were one acre or less in size and suppressed within 24 hours of detection.

Information on historic (pre-1855) levels of dead fuel on the ground is non-existent except for journal entries from early pioneers (WRWA). It is believed that the range of natural fuel loading varied between 5-50 tons per acre throughout the entire White River watershed. Current fuel loadings in the planning area range from 12 to 56 tons per acre. The majority of heavier fuel loadings occur in older stands, which have a high mortality rate in the grand fir. At least 15 tons per acre of dead and down woody material in east side communities and 25 tons per acre on west side communities should be maintained and evenly distributed across managed sites (S&G FW-033). The White River Watershed Analysis recommends 10 to 20 tons of surface residue per acre with at least 75% of the material being greater then 3 inches in diameter for maximum fuel loadings in the transition zone. Although the current fuel loadings may be considered within the natural range of conditions, some units are at the high end of the range.

The current road system provides adequate access and response times for fire suppression. Communities at risk include Pine Grove and Bear Springs, identified in National Fire Plan. Infrastructures at risk include the Clear Creek Campground, Oregon State Highway Maintenance Compound, Bear Springs Work Center and campground, a fiber optic relay building, Keeps Mill Seed Orchard and a power line. Resource values at risk include the White River Wild and Scenic River corridor, critical wildlife habitat, commercial timberland, the Highway 26 scenic viewshed and riparian areas.

Direct and Indirect Effects

Alternative I

There would be no trees cuts in Alternative I. Stand structures with the current ladder fuels and fuel loading would remain the same, as would the species composition. Stands dominated by non fire resistant tree species would have higher mortality from a surface fire. Current fire starts and predicted fire behavior would not be expected to change in the near future. Leaving roads open would allow current levels of access for fire suppression.

Alternative II

Cutting trees would result in more open stand structures with reduced ladder fuels. The microclimate would change on the forest floor. More sunlight would reach the floor creating hotter, drier conditions. Fine fuels (grass, shrubs) would become more abundant. Some fire behavior attributes (probability of ignition, rate of spread) would increase, and may result in larger, faster moving fires; however, more open stand structures and reduced ladder fuels would help confine fires to surface fuels and lower the probability of wildfires transitioning into independent running crown fires. Chances of successful wildfire suppression are increased when fires are confined to surface fuels. Slash left from timber activities would create a short-term increase in fuel loading, which would be alleviated as soon as slash treatment is completed. Cutting trees along with planting seedlings would increase species diversity and the percentage of fire resistant trees (i.e. ponderosa pine, Douglas-fir, and western larch).

Machine grapple piling the slash concentrates fuels generated by logging activities and some natural fuel loadings considered in the high range. Consolidating the fuels is essential for the protection of the residual trees during slash disposal. Large down woody material would not be piled. Heavy equipment used to grapple pile slash would be confined to existing skid roads and trails, where possible.

Burning the machine grapple piles would dispose of the concentrated slash, resulting in less fuel loading. Burning piles during the winter prevents fire creep. Burning piles concentrates heat in the soil directly beneath the pile. Loss of soil profiles and the creation of hydrophobic soil could result directly beneath machine piles that are burned. Grapple piles would be located on existing skid roads and trails, where possible.

Road closures and deep ripping landings and entry points would limit access for the public and fire suppression forces. Less public access may result in fewer dispersed campsites. The probability of human caused wildfires could be lowered. Less access for fire suppression equipment could allow some fires to grow larger.

Alternative III
The effects of this alternative are similar to Alternative II with a few exceptions. Alternative III would cut more trees, especially fire intolerant species. There would be more acres planted with fire resistant species. More open stand structures and less ladder fuels would be present. The microclimate would be changed substantially on the forest floor. An increase in sunlight would allow an increase in fine fuels (grass and shrubs). More activity slash would be generated, which would require additional or larger grapple machine piles.

Alternative IV
The effects of this alternative are similar to Alternative II with a few exceptions. Alternative IV would cut fewer large trees. Less open stand structures would be present. There would be fewer acres planted with fire resistant species. The microclimate would change less and on fewer acres than in Alternative II and III. Less slash would be generated which would require fewer or smaller grapple machine piles.

Cumulative Effects
The area considered for fire and fuels analysis is the Cascade crest to the west, the White River to the north and the forest boundaries to the east and the south. Past, present and foreseeable future activities include timber harvest, road closures, and fuel treatment in the Clear, Camas, Hilynx, Diablo and Juncrock Planning Areas.

Assumptions for this analysis area include: fire intensities will be lower where natural dead and down fuel loadings are reduced; lower fire intensities result in less damage to standing trees; opening up the canopy, reducing ladder fuels and lower fire intensities would reduce the likelihood of a wildfire transitioning into an independent running crown fire; crown fires are impossible to suppress until they return to the surface.

Past, present and foreseeable future activities in the planning areas have opened up stand structures and reduced fuel loads which have created conditions that limit the potential for

independent running crown fires to become initiated. Juncrock continues this trend over the landscape and would create conditions where fire suppression activities have a higher expectation of success. Communities at risk would experience lower probabilities of impacts from uncontrollable wildfires.

3.10 Air Quality

Existing Conditions

Two critical airsheds of note lie near the vicinity of the Juncrock planning area. The Mt. Hood Wilderness Area's airshed is federally protected and is approximately 12 miles to the northwest. Current air quality is generally good most of the year and is monitored daily. Smoke (airborne particulate matter) intrusions shall be minimized in Class 1 airsheds (MHFP FW-052). The City of Portland's airshed lies about 35 miles due west and is sensitive to any additional pollution.

Winds in the planning area generally blow from the west, southwest or northwest. Exceptions occur during east wind events where winds from the east blow across the Mt. Hood National Forest and into the City of Portland. These east winds are unpredictable but generally occur during the fall and winter. East winds can be very strong in the Columbia River Gorge and west of the Cascade crest. They are generally light and variable east of the crest around Juncrock.

Large wildfires generate large smoke columns that may reach up to 20,000 feet or more. The smoke columns of wildfires will always move in the direction of the general winds. A large smoke column originating from the planning area that is influenced by an east or southeast wind would be very noticeable in both the Mt. Hood Wilderness and the City of Portland. Large fires are possible in an east wind event but generally will occur during westerly winds due to the general wind pattern most of the year. West winds are generally stronger then east winds in the planning area.

Direct and Indirect Effects:

Alternatives I, II, III, and IV

Burning slash piles produces smoke. Every alternative has the same effects but to slightly differing degrees. The more fuel that is consumed, the more particulate matter is put into the atmosphere. Where that particulate matter travels is dependent on the height of the smoke column and the wind direction at the time. Smoke could intrude into Mt. Hood Wilderness airshed or The City of Portland's airshed depending on the direction of the transport winds at the time.

Alternative I would have no slash piles burned and no particulate matter produced. There would be no appreciable change in air quality. If a wildfire were to burn in this area, particulate matter could be higher than if slash were burned under more controlled conditions

All three action alternatives would require fuels treatment. The fuels treatment would consist of piling the slash and burning it when a west, southwest or northwest wind is present. All prescribed burning would follow Oregon Smoke Management Guidelines. This would avoid smoke intrusions into critical airsheds. Alternative III will have the lowest remaining fuel loads on the ground followed by Alternatives II and IV respectively. All three of these alternatives

will produce smoke in varying degrees as fuel treatment is completed. Alternative III would generate the most smoke followed by Alternatives II and IV respectively.

Cumulative Effects.
No cumulative effects have been identified.

3.11 Recreation

Existing Condition
A wide range of recreation opportunities is provided to the public. All but one of these opportunities is found in other places on the Mt. Hood National Forest. These include but are not limited to dispersed camping, driving for pleasure, hunting, hiking, and biking.
The one experience unique to this and two adjacent planning areas is the McCubbins Gulch OHV trail system. McCubbins Gulch OHV Area is the only designated OHV system on the forest. Motorcycle enthusiasts from all over the Pacific Northwest use this area.

Off Highway Vehicles: The planning area includes 3.64 miles of the McCubbins Gulch OHV trail system located in Units 17, 18, 19, 20, and 21. The McCubbins Gulch Campground is three miles east of Juncrock. The OHV system was designed for and is used primarily by off road motorcycles. Part of the OHV system is located in the southern portion of the planning area adjacent to FDR 2130220. Motorcycle trails were constructed in 1996. Also included in this planning area is the McCubbins OHV Day Use site, located north of the junction of FS roads 2130 and 2130220. This site was completed in 1997 to relieve the pressure of increased use at McCubbins Gulch Campground and to allow better access to the west side of the trail system. Use of this site is increasing.

Hiking: There are 1.39 miles of the Rimrock Trail #487A in the planning area. This trail is open to hiking, horse use, and mountain bikes. This trail connects the Camas Trail system and Clear Creek Campground to the Barlow Road, approximately 1.5 miles north of the planning area. The trail goes through Unit 9, cross FDR 2131, and continues on an existing road bed for approximately 100 yards, then continues through the plantations adjacent to Unit 8.

Driving: Driving for pleasure is one of the main recreation activities on the forest. The primary travel routes through the planning area are FDR's 2130, 2131, 4310, 4330, and Oregon State Highway 216. Traffic on these roads is high on summer weekends and during hunting seasons. Most vehicles are passenger vehicles with some motor home and fifth wheel recreational vehicle use.

Camping/Hunting: All camping in this planning area is dispersed use. Camping usually takes place during the various hunting seasons and throughout the summer months. There are no developed campgrounds within the planning area. Clear Creek Campground is adjacent to the eastern boundary. Access to this campground is FDR's 2130 and 2130260 through the planning area.

There are two main dispersed camping sites accessed by FDR 2130 and three sites accessed by FDR's 2131 that are used during some hunting seasons. Deer, elk, and various birds and small

game are hunted through out the fall and winter. These camps are often occupied for up to two weeks before, during and shortly after hunting season. Hunters use the transportation system to access camps and to travel between various hunting areas.

Direct and Indirect Effects

Alternative I

Existing uses and facilities would not change. User access within the area would remain at current levels since no road closures or new construction would be planned. Since no log haul is proposed in this alternative, there would be no safety concerns or conflicts between recreation and commercial use.

Alternatives II, III, and IV

OHV's: Tree cutting and skidding would create wider distances between trees and reduce ground vegetation. This in turn would increase sight distance for trail users. Increased sight distance may increase riding safety by increasing visibility for oncoming traffic. Increased visibility would allow users to drive at higher rates of speed, which would decrease riding safety.

Harvest also has the potential to damage portions of the OHV trail system and the hiking/mountain bike trail due to the construction of temporary roads on existing trails, or harvest operations. The logging operations will restrict use of the trail systems during times of operations.

There is the potential for the user group to create random trails as the stand is opened up due to tree cutting and skidding. This would increase future maintenance and restoration costs as these trails would need to be obliterated. Harvest activities would increase sight distance, potentially increasing rider safety, however, users may travel at higher speeds, which may have a negative impact on rider safety.

Skidding operations would damage portions of the OHV trail system where skid trails cross the trail. Requiring the operator to limit the crossings and repair all skid trail crossings would mitigate this effect. During logging operations, a trail use restriction would be in effect.

Machine Grapple piling of slash creates the potential for the user group to create random trails off of the main trail system as more ground is opened up. This would encourage off trail use. Locating piles at the entrance to skid trails and leaving some slash along both sides of the existing trail system would help mitigate this effect.

Hiking: The Rimrock hiking and mountain bike trail passes through Unit 9. Tree cutting and skidding would open up these stand canopies. This would increase the amount of sunlight on the trail, causing the trail to dry out faster, resulting in dustier conditions. Dustier conditions degrade the recreational experience. These conditions would improve over time as the canopy closes and soil moisture increases. Trail #487A would be temporally relocated onto an existing road and connecting skid trails located in the plantation adjacent to Unit 8, after it crosses FDR 2131.

Skidding operations would damage portions of the Rimrock trail where skid trails cross the trail. Requiring the operator to limit the crossings and repair all crossings would mitigate this effect. During logging operations, the trail would be temporarily rerouted.

Reconstruction of FDR 2131011 into Unit 8 would have a negative short-term effect on approximately 1/4 mile of the trail. The trail would be obliterated with the reconstruction. The trail would be restored after hauling operations are completed.

Alternative IV does not reconstruct FDR 2131011. Rimrock trail 487A would not be obliterated. The Rimrock Trail would be closed during harvest activities.

Driving: There are 26.33 miles of open roads. These proposed alternatives would close 8.69 miles of open road, reducing the amount of miles for the driving public.

Mixing log haul traffic and recreation traffic increases driving hazards. The proposed alternatives would use a portion of FDR 2130 for log haul, which is the main access road into Clear Creek Campground. Limiting the log haul to weekdays only would help mitigate this effect.

Camping/Hunting: Log haul on FDR 2130 would cause noise, which is a concern of the recreational experience. Harvest activities have no effect on two of the main dispersed sites accessed from FDR 2131. The third dispersed site is located on an old landing at the junction of FDR's 2131 and 2131230 within Unit 9. This dispersed site in Unit 9 would be closed during harvest activates. Proposed road closures would eliminate a few dispersed sites but would have no effect on the overall dispersed camping opportunities.

Cumulative Effects:
The total area analyzed for cumulative effects is the White River Wild and Scenic River Corridor on the north, Oregon Highway 216 to the south, Mt. Hood National Forest boundary to the east, and FDR 43 to the west. This area includes the McCubbins Gulch OHV area; hiking trails are Rimrock trail #487A, Clear Creek trail #487, and Camas trail #490. Also included in the cumulative effects analysis are the Wildfire, Diablo and Path timber sales, and the Hilynx planning area.

Assumptions include: OHV use is increasing. Multiple entries throughout the OHV trail area have opened the stand canopy. Logging will take place during the summer when OHV use is the highest. Path Timber Sale will be logged over the next 5 years.

OHV's: Cutting trees across three ongoing timber sales and one proposed timber sale creates wider spacing between trees resulting in longer sight distances. This could lead to higher speeds, although the increased visibility may offset this safety risk. Wider spaced trees also generate opportunities for user created trails, which can cause dangerous intersections. Ripping and piling slash on skid trails would reduce user created trails.

Opening the canopy over larger areas dries out the trail over longer distances, and creates dustier conditions along the approximate 40 miles of OHV trails. OHV use mixes the trail surface, which exposes the lower layers to drying conditions.

Portions of the trail system being rerouted because of ongoing timber harvest activities could cause increased use on the remaining trail system.

Hiking: As Unit 9 along Trail #487A is opened, conditions on the trail would change, becoming sunny and dryer. Long distance views would become available as the stand is opened up, possibly, enhancing the recreation experience. This view would change as trees in the foreground grow and fill in.

Driving: Cumulatively, closing roads reduces the miles of roads available to the driving public, reducing the opportunity for driving in a forest environment. The main through routes would remain open.

Camping/Hunting: The three developed campgrounds, Clear Creek, Keeps Mill and McCubbins Gulch, would remain open. There would be no cumulative effects to any of these campgrounds. Some potential dispersed sites would become unavailable when roads are closed. Many other dispersed sites would be available. Hunting opportunities would remain unchanged.

3.12 Scenic Resources

Existing condition

The landscape consists of gently sloped, continuous textured forested canopy with occasional rock outcrops typically found within the Cascade crest zone. Vegetation consists predominately of grand fir in association with Douglas-fir, western hemlock, noble fir, and western larch.

The critical viewpoints for scenery analysis are views from Oregon Highway 216 and U.S. Highway 26. Distance zones for landscapes are foreground, middleground and back ground. (See glossary.) Human activities are not evident to the casual visitor in the foreground of Juncrock. Oregon Highway 216 divides Unit 19 and is considered foreground. Most middleground views are screened by vegetation from Unit 19. Units 17, 18, 18R, 20 and 21 are considered middleground from the critical viewpoints. There are no background zones seen from critical viewpoints. In all other areas, management activities may dominate the landscape.

The existing scenic condition (now referred to as scenic integrity under the new scenery management system) ranges from low to moderate scenic integrity (moderately altered to slightly altered). [Note: what was called existing visual condition in the old visual management system (1974) is now called Scenic Integrity (see Landscape Aesthetics; A Handbook for Scenery Management-Agriculture Handbook, 1995, #701)].

Direct and Indirect Effects

Alternative I

Scenic integrity would remain unchanged because no activities would occur.

Alternatives II, III, and IV
The Forest Plan Visual Quality Objectives (VQO's) are retention in the foreground as seen from Oregon Highway 216, partial retention in the middleground as seen from Highways 216 and 26, and modification for the remaining areas. Trail #487A is a level II trail, with VQO's of Partial Retention in the near foreground, Modification in the far foreground and Modification in the middleground distance.

The VQO's and their definitions are as follows: (MHFP S & G FW-552-557; 560-571; 581-583; 584-589):

- ✓ Retention: Human activities are not evident to the casual forest visitor.
- ✓ Partial Retention: human activities may be evident but subordinate to the characteristic landscape.
- ✓ Modification: human activity may dominate the characteristic landscape but must, at the same time, utilize natural established form, line color, and texture. It should appear as a natural occurrence when viewed in foreground or middleground.

Cutting trees, building landings, skid trails, and temporary roads within Unit 19 could create small (less than 1/2 acres) openings visible from critical viewpoints. Unit 19 would meet the definition for retention if these activities were not evident to the casual forest visitor from Highways 216 and 26. To meet retention, emphasis would be placed on retaining large, healthy trees, openings would be planted with western larch to provide spring and fall color, stumps and tree marking would not be visible from the highway.

Cutting trees at variable spacing and planting openings in Units 17, 18, 18 R, 20, and 21 would create textural changes in the landscape. Small clumps of trees would be protected in Unit 19 for vegetative screening to maintain partial retention of the middleground. All harvest activities outside the scenic viewshed would not change the existing VQO of modification.

Cumulative Effect:
The White River Wild and Scenic River corridor bound the area analyzed for cumulative effects on the north, the Warm Springs Indian Reservation on the south, the Mt Hood National Forest boundary on the east, and FDR 43 on the west. This analysis area will be stratified to retention, partial retention and modification VQO areas.

Assumptions include: The "seen area' is the part of the landscape visible from the viewers position on a travel route, trail, water body or recreation use area. Projects included in the effects are Diablo, Wildfire, and Path Timber Sales, and the Hilynx planning area. These projects currently meet Forest Plan VQO's. The presence of large trees provide a distinct personal, social, and esthetic value that other types of forested environments cannot provide.

The scenic value, present in areas where management activities are less evident would remain throughout the landscape. The visual aspect of tree removal, when looked at from a larger landscape viewpoint, is very low. There have been texture changes in some areas but all VQO's from viewpoints along Hwy 216 and 26 would be met.

Trail #487A, through Unit 9 is located along a GTR, then goes through the Unit. The view from the trail would meet VQO's. The trail goes through the shelterwood for a short distance, and then would be rerouted through an existing plantation with trees 15 to 20 feet tall. Views of the landscape would be seen through openings in the stand. The landscape would be seen as various shades of green. Landscape views would diminish over time as the stand fills in.

A forested environment provides an immeasurable social value in addition to many kinds of recreation. This forested environment includes trees of different sizes and species and includes other types of vegetation. The experience that one feels when recreating in this environment is influenced and affected by management activities. The value of this experience is different for all who use the National Forest. Harvest activities may affect the social value for some users in certain areas by removing trees. Other landscapes within and adjacent to the proposed harvest units would retain their vegetative composition, including the presence of large trees. For some, opening vistas by removing trees adds value to the recreational experience. While there is a local effect to the esthetic value from removing large trees, the cumulative effect when experienced throughout the larger landscape should be very low. The social value, present in areas where management activities are less evident, would remain throughout the landscape.

3.13 Heritage Resource

Existing Condition

A cultural resource survey was conducted on a planning area scale and documented in Heritage Resource Report 01/01/01. Survey methodology was conducted in accordance with the 1995 agreement between Region 6 of the Forest Service, the State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation. The SHPO has reviewed the finding of **No Effect** to heritage resources and had no objections with this finding.

The Juncrock Planning Area lies adjacent to the boundary for the Confederated Tribes of Warm Springs. From a report compiled through oral interviews and archival sources, conducted over a period of four years, it has been determined that there are no known traditional use areas within the project area (An Ethnographic Study of the Mt. Hood National Forest, Oregon, Report No. 86, Archaeological Investigations Northwest, Inc. Aug, 1995).

A possible segment of the Oak Grove/Oregon City Wagon Road (662EA013) was also found to lie within the Juncrock Planning Area. The road was constructed in the late 1800's as an alternative route to the Barlow Road, and connected the Willamette Valley to eastern Oregon. The wagon road has been extensively fragmented through past road construction and reconstruction, and from other development. The short segment within the Juncrock planning area may be one of the few remaining portions of the road.

The Clear Creek Irrigation Ditch (661EA259) is a previously documented site that bisects the Juncrock Planning Area. The ditch was constructed in the early 1900's to transport irrigation water from Clear and Frog creeks to the Juniper Flat Improvement District. The ditch is in good condition and continues to be used and maintained by the improvement district to transport water.

Two prehistoric isolate sites (661IS261 and 661IS271) lie within the Juncrock planning area. Both sites are of indeterminate cultural affiliation. One site consists of a single flake located within a small ephemeral drainage. The other site consists of flakes scattered along FDR 2131.

The remains of an historic vehicle (661IS270) lie within the Juncrock planning area. The site consists of a rusty metal vehicle frame, running board, and headlight. The site dates to the mid 1900's.

Direct and Indirect Effects
Alternative 1
Since no activities would occur, there would be no effect to heritage resources other than the natural processes that are already occurring.

Alternatives II, III and IV
The Oak Grove/Oregon City Wagon Road (661EA013) lies within a Green Tree Retention (GTR) Area. No activities are proposed within the GTR area in association with Alternatives II, III and IV. The alternatives would have no effect on the wagon road.

The Clear Creek Irrigation Ditch (661EA259) is designated as a riparian reserve. Activities proposed within the riparian reserves include directionally falling timber away from the ditch and hand piling slash. Heavy machinery and skidders would be limited to existing skid trails and roads. The proposed activities within the riparian reserve for Alternatives II, III and IV would have no effect on the ditch.

The prehistoric isolate 661IS261 is located within an area that is not being entered or impacted by activities proposed under Alternatives II, III or IV. The alternatives would have no effect on the site.

The prehistoric isolate 661IS271 is located on Forest Service Road 2131 in an area of proposed roadwork. Shovel tests determined that the site is ineligible for inclusion on the National Register of Historic Places. All significant information has been collected from the site and the site offers no further archaeological research potential. No avoidance measures are necessary or required for ineligible sites. Alternatives II, III or IV would have no effect on the site.

The historic vehicle is protected with a ten-meter buffer zone. No activities would occur under Alternatives II, III and IV within the designated buffer zone. The alternatives would have no effect on the site.

Should additional historic or prehistoric cultural resources be discovered within the planning area, work would immediately cease in that area and Heritage Resource personnel would be notified to evaluate the site for potential effects and determine appropriate mitigation measures.

Cumulative Effects
Since there would be no effects to heritage resources under any alternative, there would be no cumulative effects.

3.14 Soils

Existing Condition

The landform characteristics consist of gently rolling terrain resulting from hard, stable, volcanic rock deposits. Field investigations of the planning area and proposed units occurred jointly with the district geologist. These field trips verified that slopes within the planning area generally do not exceed 30%, with the predominate soil type in the area mapped as 352 (Mt. Hood National Forest Soil Resource inventory (SRI), Howes, 1979). In addition, shovel excavations revealed this soil is slightly rocky and well drained, having 10 to 30% coarse fragments throughout the soil profile and typically a silt loam to loamy surface soil. This soil is productive and exhibits resiliency to disturbance. The surface and subsurface erosion potential are estimated as moderate and high on bare soil, respectively. The compaction hazard is estimated as moderate, and the susceptibility to soil displacement is low.

The percentage of area in a detrimental soil condition varies from stand to stand because of the manner and extent of past ground based timber harvesting. All proposed stands were visited and observed with aerial photography to verify mapping and previous impacts. Of the stands proposed for activity, Unit 8 appeared to have the greatest existing damage as determined by visual observation. This stand was chosen for further existing soil damage investigation using shovel probe transects, which revealed less than 5% existing detrimental soil damage. All other units that are proposed for activity likely fall below this percentage.

No mineral or energy resources are present in the immediate planning area with the exception of Rimrock Quarry, which would not likely be used for projects described in this analysis.

Direct and Indirect Effects

Impacts to soil resources are disclosed with appropriate mitigation measures based on the MHFP as amended by the NWFP. Impacts such as soil compaction caused by ground based harvest and fuels treatment as outlined in the proposed action are measured by percent of harvest area in detrimental soil condition. This is a combined measurement that includes soil compaction, displacement, and severe burning, and their relationship to erosion and long term site productivity. Detrimental soil conditions are measured using shovel probe transects (compaction) and visual observation (severe burning, displacement). Activity areas (units) should not exceed 15% detrimental soil conditions (FW-022). (Should, as defined in the MHFP, means that the action is required. However, case-by-case exceptions are allowed if identified and documented during interdisciplinary project planning.)

Soils and long-term productivity are protected by standards and guidelines for the retention of woody debris, ground cover, and live trees. All of these standards and guidelines protect soil structure and macropore space and soil organisms such as mycorrizal fungi.

Alternative I

There would not be impacts from skidding, road construction, grapple piling slash, and pile burning to soil resources. Soils would continue to develop through natural processes. Percent existing detrimental soil condition would slowly decline as compacted areas recover due to physical and biological processes

Alternatives II and III
Skidding, road construction, grapple piling slash, and pile burning would result in soil compaction and isolated soil damage from burning. Reductions in site productivity and problems with erosion, which include unacceptable soil loss and sedimentation of local watercourses, are not expected from the implementation of the proposed actions and risk reduction alternatives as designed. All alternatives would enter stands with acceptable percentages (estimated 0 to 5%) of existing detrimental soil condition from old compaction. Maximizing use of existing skid trails where possible should result in soil damage remaining within the acceptable forest plan standard of 15% following timber harvest and fuels treatment. It is estimated that Unit 8 would fall between 10 and 14%, with the remainder between 5 and 10% following all activities. Therefore, it is expected that site productivity would be maintained over time, with no perceivable or measurable loss in tree growth. In addition, it is important to note that the effects from skid trail patterns, if kept within the 15% threshold, tend to be thin, linear features within a harvest unit instead of one large, concentrated area of compacted ground within the same unit. This tends to minimize the impact to any particular patch of vegetation, except for the areas designated as landings.

It is expected that detrimental damage would remain below 15% in all proposed units. Subsoiling within regeneration openings to fully facilitate reforestation activities would mitigate compaction. There would be an overall positive effect on the soil resource within these units. For other treatment areas, if implementation monitoring reveals damage in excess of 15%, compaction can be mitigated through subsoiling of skid trails and landings. Should subsoiling occur, it should take place following harvest, but before reforestation activities, and be approximately 16 inches in depth, plus or minus 4 inches to avoid pulling up subsurface stones and boulders.

Alternative IV
This alternative has the same effects and mitigations as alternatives II and III except that proposed Units 4 and 15 would be helicopter logged, followed by ground based fuels treatment. Because helicopter logging would have less impact to the ground, there would be slightly less overall detrimental soil impact as compared to alternatives II and III.

Cumulative Effects
The spatial area for cumulative analysis is the combined area of activity units. It was assumed Unit 8 appeared to have the greatest existing damage as determined by visual observation, which revealed less than 5% existing detrimental soil damage. All other units that are proposed for activity are assumed to fall below this percentage.

Cumulatively, the analysis meets or falls below the 15% maximum detrimental soil damage standard and guide.

3.15 Invasive Plant Species
The Record of Decision for Managing Competing and Unwanted Vegetation FEIS (USDA-FS 1988) requires that noxious weeds be addressed. Forest Service Manual (FSM) direction requires that a Noxious Weed Risk Assessments be prepared for all projects involving ground-disturbing activities. For projects that have a moderate to high risk of introducing or spreading

noxious weeds, recent Forest Service policy (Executive Order 13112, dated February 3, 1999),requires that decision documents must identify noxious weed control measures that would be undertaken during project implementation (FSM 2081.03, 11/29/95). This project has been determined to have a "moderate" risk of introducing or spreading invasive plants.

Existing Condition
Invasive plant species are non-native plants that can inhabit and negatively alter native plant communities and ecosystems. The invasive plant species of concern are legally recognized as noxious weeds, meaning laws have been developed by the state of Oregon to restrict their spread and effect on the environment. The following noxious weeds are identified by the Oregon Department of Agriculture and are known to occur and are being treated within the Juncrock planning area. An "A" rated weed has an economic impact, and is known to occur in the county in small enough infestation to make eradication practical. A "B" rated weed has an economic impact, and is of limited distribution in the county and is subject to intensive control or eradication, where feasible. Table 3-18 lists invasive plant species.

Table 3-18 Invasive Plant Species	
"A" rated weeds	"B" rated weeds
Tansy Ragwort (*Senecio jacobaea)*	Scotch Broom (*Cytisus scoparius*)
Houndstongue (*Cynoglossum officinale)*	Diffuse Knapweed (*Centaurea diffusa*)

Since 1984 the tansy population has expanded in size and intensity. The 1976 tansy survey map indicated 8 locations infested, 1986 indicated 18, 1996 indicated 20, and 1998 indicated 23, totaling 3 acres.

Houndstongue has expanded its range westward from its origin near Keeps Mill seed orchard in the early 1980's, currently totaling 60 acres infested. Scotch broom has expanded its movement eastward from the Willamette Valley and now infests a total of 2 acres. There was less than 5 acres infested in 1975 and now totals 65 acres for these three species.

Diffuse knapweed is prevalent in all previously disturbed areas.
These species occur on disturbed areas such as past timber harvested units, skid trails, landings, roadside prisms, concentrated livestock use areas, OHV trails, and dispersed campsites. Forested areas with little disturbance and at least 70% canopy closure are generally weed free.

Direct and Indirect Effects: Alternative I
No new weed populations would occur from ground disturbance caused by harvest activities. The rate of spread would be expected to continue at the same level from other activities. Road closures would not be implemented, thus there would not be an increase in the cost of monitoring and treating weeds.

Direct and Indirect Effects: Alternative II, III, and IV
Alternatives II, III and IV would prescribe different types of stand treatments. Canopy closure would vary between 4 and 66%, averaging 44%, 25%, and 49% respectively. Cutting trees, road building, and landing construction would cause a reduction in canopy and stems, which would

provide favorable light conditions for noxious weed establishment. Harvest activities, deep ripping, and grapple piling expose soils, which provides a seedbed for noxious weeds. Once piles are burned, soil conditions are favorable for houndstongue establishment.

To reduce the risk of spreading noxious weeds and to lower costs involve the timing of about 10.2 miles of road closures to allow for noxious weed treatment and monitoring of noxious weed sites after post harvest activities are complete. Closing roads would increase the cost of implementing the districts noxious weed program. Limiting access to the public would help reduce the opportunity of spreading weeds. Timing of road closures are displayed in Tables A-3 and A-4.

Other provisions require cleaning of off-road equipment related to logging operations, road construction and reconstruction, and road maintenance. Based upon the existing noxious weed inventories in this area, the purchaser/contractor would be required to certify in writing that all off-road equipment is free of Invasive Plants prior to each start-up of timber sale or road related operations, and for each subsequent move of equipment onto National Forest lands.

Design Criteria call for the Purchaser/Contractor to employ whatever cleaning methods are necessary to ensure that off-road equipment is free of soil, seeds, vegetative matter, or other debris that could contain or hold seeds prior to coming onto National Forest lands. Purchaser/Contractor shall notify the Forest Service at least 5 days prior to moving each piece of off-road equipment onto National Forest lands. An authorized Forest Official, with knowledge to identify invasive plant materials, would conduct inspection of equipment prior to off-loading.

Cumulative Effects
The potential analysis area for noxious weeds is as far as humans, livestock, wildlife, or vehicles range. The focus of this analysis is the role of activities on the Barlow Ranger District and their contribution to the introduction and spread of noxious weeds.

Assumptions include: U.S. Forest Service has only a slight influence on movement of humans, livestock, wildlife, or vehicles in or out of the planning area. Once a small infestation is detected, the rate of spread can be controlled. Mitigation and an active treatment program can control the rate of spread. Herbicides are the most cost effective method for controlling the spread of noxious weeds.

Many actions have and would contribute to the risk of weed spread on the district. Conceivably, 550 acres would become more susceptible to a weed establishment opportunity. These new weed populations would be a source of seed to outside areas.

There are several case studies on the district of noxious weed treatments that have varying levels of success. In the early 1990's toadflax was found during monitoring and it was eradicated with an active noxious weed program. Scotch broom was documented on the district in the 1980's. Recent monitoring indicates this noxious weed is seldom found on the district. In the early 1980's, houndstongue originated near Keeps Mill seed orchard. There was no active control when the infestation was small. Houndstongue has expanded its range westward, now totaling 214 acres.

In the mid 1970's, eight locations of tansy were found. From 1984 to 1997, hand pulling and bio-control was used to treat tansy. The population continued to expand. In 1999 treatment included herbicides and the rate of spread has decreased with complete eradication of some sites.

3.16 Range

Existing Condition

This planning area lies within the western pasture of the White River Cattle Allotment. The permit is 250 cow/calf pairs, under a deferred grazing system. The current permitted grazing season is from 6/1 to 9/30. The livestock are first turned out in the eastern pasture near McCubbins Gulch. They graze this pasture for about 1½ months then move to the western pasture after July 15. The pasture division line is the "Keeps Mill" road (2110) fence.

The majority of permanent range occurs in the meadows and riparian areas. In the timbered portions of this allotment the transitory range provides forage on a relatively short-term basis (5 to 30 years). This forage is produced in openings created by timber harvest activities. Forage production is significant for the first 8-10 years following harvest but drops off as the tree canopy shades out the herbaceous vegetation.

Specific details of allotment management are discussed in the White River Allotment Management Plan, available at the Barlow Ranger District. Range improvements within the allotment are a combination of drift and boundary fences, stock watering ponds, spring developments, corrals and cattleguards.

Direct and Indirect Effects

Alternative I

No trees would be cut. Landings, skid trails or roads would not be built. New openings in the forest canopy would not be created which would have produced new forage. There would be no increase in the carrying capacity for the harvest units proposed in Juncrock from additional forage or changes to the current distribution patterns of the livestock. Road closures would not be implemented thus there would not be an increase in the cost of permit administration, monitoring, and range improvement maintenance from the current condition.

Alternatives II, III, and IV

Alternatives II, III and IV would prescribe different types of treatment, each one based on the existing stand structure. Canopy closure would vary between 4 to 66%, averaging approximately 44%, 25% and 49%, respectively. Cutting trees would create openings in the forest canopy, which would increase herbaceous forage, increasing carrying capacity and improving distribution patterns. The difference between the alternatives in amounts of forage created is minimal. This transitional forage increase would last 5 to 30 years before the forest canopy fills back in. Animals would not be as concentrated, thus utilization levels would be lower in certain areas (MHFP FW-293).

There have been studies done on livestock grazing versus reforestation after timber harvest. There are two contrasting views in this area. One is that they are not compatible due to cattle

browsing, rubbing, or trampling of the newly planted seedlings. The other view is that livestock can in fact be utilized as an additional tool for controlling competing understory vegetation in and around new seedlings (Doescher, and others, 1987).

Studies have examined and monitored damage resulting when livestock and reforestation occurred in the same area. (Kingery and Graham, 19900). The conclusion was that more seedling mortality occurred from pocket gophers, deer and elk, and factors other than animals (competition from grass for sunlight, moisture, and space) than from livestock grazing.

All Action alternatives propose to close 10.94 miles of roads. Closure of roads would limit access. This would increase the cost of permit administration and monitoring. For example, road 4330018 that currently provides access to the spring development in Unit 4, would be closed, making maintenance access harder and more time consuming.

Cumulative Effects
The analysis area for cumulative effects is the White River Allotment. Diablo, Bear Knoll, and Hilynx Planning Areas are within the White River Allotment.

Assumptions made: White River would continue as an active allotment; timber harvest activities and road closures are likely to continue into the reasonably foreseeable future within the allotment; forage would be increased for 5 to 30 years following timber harvest from past planning efforts; forage in Juncrock is decreasing because the canopies are closing in; Juncrock amounts to 8% of the allotment.

Juncrock activities, at the most, affect the overall amount of forage produced in the White River Allotment by 1%. There have been concerns that grazing has contributed to increasingly dense forests and changes in tree species composition (Belsky and Blumenthal 1997). Other research suggests that, based on a historic scale, that concept would have been partially correct, but is not likely in the managed-grazed context of today's grazing systems, (Borman, 2003).

The trend of closing roads would increase the cost of permit administration and monitoring.

3.17 Economic Resources:

One of the goals of the Northwest Forest Plan is provide a sustainable level of forest products for local and regional economies and to provide jobs. This analysis tiers to the Northwest Forest Plan Final Environmental Impact Statement (FEIS, p. IV-112), which has an in depth analysis of the economic basis behind the goal of providing forest products for local and regional economies. It also contains an analysis of the social and economic benefits and impacts of preservation, recreation, and other values.

For the action alternatives, most of the costs for planning have already occurred. All action alternatives would remove timber. Logging systems to remove the timber are similar in Alternatives II and III. Both alternatives have road construction, and use the same types of logging systems. The increases in volume in Alternative III would be more economical for removal. There would be product value difference between these two alternatives, as more and

larger trees would be harvested in Alternative III. The associated cost for Alternative IV would be higher because two units are scheduled for helicopter logging.

A timber sale would be appraised just prior to advertisement, so the figures below would likely change in today's fluctuating markets, but the relative difference between the alternatives would remain approximately the same. Competitive bidding may result in increased value. Table 3-19 displays costs and economic returns for a timber sale.

Table 3-19 Costs and Benefits

	Total Net Value $	Agency Costs	Net Present Value	Benefit/cost Ratio
I	$ 0	$ 0	$ 0	$0
II	$-40,623	548,100	-99,450	0.83
III	$198,800	700,800	94,524	1.13
IV	$-71,661	241,020	-91,470	0.63

Agency Costs: This figure (undiscounted) is based on Regional and Forest Averages. For the action alternatives it includes costs that have not yet occurred such as sale administration.

Net Present Value: This is the present day project value where estimated administrative costs and essential KV costs (discounted), are subtracted from total revenue generated (discounted). Benefit cost Raito: this is a ratio derived from dividing the estimated bid value (discounted) by the estimated administrative and essential KV cots (discounted). A benefit/cost ratio greater than 1.0 indicates that benefits exceed costs.

Alternative I would not provide forest products consistent with the Northwest Forest Plan goal of maintaining the stability of local and regional economies now and in the future. No funding would be available for other projects, including road closures. Future costs for road closures may increase. There would be no return on the planning costs already used for this project.

Alternative II would produce approximately 9 MMBF. A full range of timber products would be removed, and logging systems would be the same as in Alternative III. Costs in these two alternatives are similar; production rates with a lower volume per acre would be less, making logging costs higher.

Alternative III would produce approximately 16 MMBF. A full range of timber products would be removed. Production rates, with an increased volume per acre, would be higher, making logging costs lower. The volume and value of the trees being offered in this alternative makes it probable there would be bidders for sales developed from this alternative.

Alternative IV would produce approximately 6 MMBF and would eliminate most of the road construction planned in Alternatives II and III. Two Units would be helicopter logged, as road access would not be constructed. This alternative has a 21" diameter limit. The larger timber is not harvested in this alternative. Smaller timber and a lower volume per acre would lower the over all product value. The associated costs for helicopter logging, along with the reduced

timber harvest, makes this alternative the least economical. If this alternative is selected, the minimal value of the smaller timber may result in no bidders for the offered sales.

Between September 2001 and December 2003, 24 separate timber sales were auctioned on the Mt. Hood National Forest. Four of the sales received no bids. Three of the 4 sales were re-auctioned at a later date. Two of these re-auctions had numerous bidders present and the sales ere sold to the highest bidder. A total of 22 timber sales were sold during this time period. The highest bidders (purchasers) of the 22 timber sales are from what is considered the local and regional areas. Some of the purchasers have their own manufacturing facilities while others are considered log brokers. All of them to some extent market logs between different mills that have been tooled for specific species, size classes and/or products. It is not uncommon for logs from one timber sale to be trucked to 3 or 4 different mills with in the region.

The purchasers of 19 of the 22 timber sales also qualify as small business" by the Small Business Administration (SBA). Eight of the timber sales were purchased by a business with less than 25 employees. Eleven of the sales were purchased by businesses with less than 500 employees. Three of the sales were purchased by business that have more than 500 employees and are not considered "small businesses" by SBA.

The highest bids on 15 of the 22 sales sold were in excess of the minimum required bid. The highest bids on 6 out of the 22 sales are almost double the minimum required bid. The bidding results of the timber sales sold since September of 2001 indicates substantial competition for forest products in the region as well as high demand for forest products form the Mt. Hood Nation Forest. Timber sales sold from the Mt. Hood National Forest provide forest products for the local and regional areas and would be purchased from business in these areas that employ people to work in the woods or in the mills.

3.18 Other Disclosures

Employment and Consumers:

Short-term increases in local employment may occur during the implementation of this project. This is primarily in the forest worker sector.

Compliance with Executive Order 12898 Regarding Environmental Justice:
On February 11, 1994, President Clinton issued the Executive Order on Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (Executive Order 12898). In accordance with this order, the proposed actions has been reviewed to determine if it would result in disproportionately high and adverse human and environmental effects on minorities and low-income populations.

A public information effort to inform and involve the potentially affected and interested individuals, agencies or organizations occurred (reference Chapter 1 of this document). No specific concerns regarding minorities or low-income families were identified during this public information process.

Environmental Justice

On February 11, 1994, President Clinton issued the Executive Order on Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (Executive Order 12898). This order directs agencies to identify and address disproportionately high and adverse human health or environmental effects of projects on certain populations. This includes Asian Americans, African Americans, Hispanics, American Indians, low-income populations and subsistence uses. The Juncrock Planning area is located on the southern end of the Mt. Hood National Forest, adjacent to the Warm Springs Indian Reservation. For this analysis, the term "Juncrock area" is use to include the planning area and the approximately 15 square miles between the ODOT compound and the Bear Springs Work Center.

Potentially Affected Communities

There are two small compounds within four miles of Juncrock. The Oregon Department of Transportation (ODOT) Compound is approximately four miles west of the Juncrock area. This compound is for employees of ODOT; three families live there year round. The Bear Springs Work Center, approximately two miles to the east of Juncrock is a Forest Service Compound. There are five Forest Service families and an office building on this compound. Occasionally, members of the CTWS rent vacant houses on the Bear Springs Compound. The population at Bear Springs increases during the summer months when temporary summer employees are hired. The population at the ODOT Compound increases during the winter months when the winter road crew works out of the compound.

The community of Pine Grove is 11 miles east of the Juncrock Area, while the largest community to the northwest is Government Camp, with Zigzag, another 10 miles to the west. The communities of Hood River, Parkdale, and Odell are 20 to 34 miles to the north. Other communities that may have an interest in the Juncrock area would include Maupin, Madras, Redmond, and Bend to the east and south and Sandy, Gresham and Portland to the West.

Census data confirm that the larger communities have minorities and low-income populations that may be affected by the Juncrock Timber Sale. The percentage of people below the poverty line ranges from 11 to 14 % of the population. Minority populations range from 14 to 21%. These small rural communities and small towns, have a lower income than the state and National average. Unemployment is higher than state and national averages, especially in the logging and lumber milling operations, as mills in Maupin, Tygh Valley, and Parkdale have closed down in the last decade. It is common for individuals from smaller, rural communities to drive into larger communities for jobs, shopping or recreation. However, there are individuals who earn their living or supplement their income from activities that occur on the Forest.

The American Indian communities of the Confederated Tribes of the Warm Springs Reservation could potentially be affected by activities in the Juncrock Planning area. Portions of past sales (wood fiber) in this area have been purchased by the Warm 'Springs Forest Products Mill, which is owned and operated by the Confederated Tribe of Warm Springs. The Planning area lies within ceded lands of the CTWS. The treaty of 1855 granted the CTWS the right of "usual and accustomed" gathering of traditional native plants and "special interest" use. According to the Ethnographic Study of the Mt. Hood National Forest (French et al, 1995), no traditional use areas have been identified. No activities are proposed that would preclude any granted rights.

Potentially Affected Workers

Employment opportunities are limited in the Juncrock area. There is work available for employees of ODOT and the Forest Service. Logging and the work associated with timber harvest such as heavy equipment operation and post harvest activities are limited to the times harvest operations are actually occurring. There are individuals in Pine Grove who work for the local logging company. They can benefit from harvest activity in the dimidiate vicinity. Post harvest activity, slash piling, and tree planting, are done mainly with contractors. In recent years, the percentages of Hispanics working on these types of contracts have increased. Alternatives II, III, and IV would provide employment to woods workers at different levels and for varying lengths of time. The nearest operating mills are the Warm Springs Forest Products Mill, on the Warm Springs Reservation, and in Bingen & Stevenson, WA. These are the communities that would benefit from employment in the mills. The no action alternative would eliminate employment in both areas.

There are hazards and risks associated with working in the woods with heavy equipment, chainsaws, falling trees, burning and driving narrow roads. These risks do not fall disproportionately on minorities or low income persons and there are safety practices in place to provide appropriate levels of protection.

Some minorities and low-income people work in the forest gathering products. In the Juncrock area, no permits have been sold for any products on a commercial basis. Other products are harvested for resale to generate income. Some is harvested for personal use. These include mushrooms, firewood, and Christmas trees. Permits are issued for most gathering, but minor use occurs without need for a permit. A large percentage of product gathering is by minority and low-income individuals to supplement their income or as a primary job. Asian Americans and Hispanics are known frequent product gathers.

The Juncrock Timber Sale alternatives may result in a short term increase in firewood opportunities and a short-term decrease in other product. Forest product availability on a landscape level would not be negatively affected. Many thousands of acres are available for gathering and the Juncrock area does not represent a special or unique source of products that are not available elsewhere. The no-action alternative would provide no firewood.

Potential Affect to Recreation

Minorities and low-income people recreate on the Mt. Hood National Forest. There is one campground adjacent to the Juncrock area. Trail 478 goes through the upper portion of the area. There are 3.4 miles of OHV trails within the planning area as well. The main recreational use of the Juncrock area is for dispersed camping and hunting during the fall.

There is no indication that minorities or low-income people focus on the Juncrock area to recreate more than any other similarly remote portion of the Forest. With the action alternatives, there may be short-term movement of dispersed campers or hunters during and after project implementation. There may also be restricted use of OHV trails for short periods of time. The no action alternative would eliminate these affects.

Potential Affect to Health
The Juncrock project would not be a significant source of pollution. Because of the distance of the proposed roads to streams, vegetative buffers would act as an effective barrier to any sediment being transported into stream channels by surface erosion or runoff. Any impact to water and air quality is discussed in Chapter III. An example of indirect effects may be water quality caused by sedimentation would be short-term and undetectable at a watershed scale. The proposed action does not involve the use of herbicides or pesticides.

An example of effects to air quality may include smoke caused by slash burning. Burning has the potential to degrade air quality for short periods of time affecting visibility for recreation users. Usual wind direction during burning would carry smoke away from nearby communities and there would be little, if any, health affect.

Potential Affect to Historical or Cultural Sties
Surveys have been conducted. The project would not affect any known sites that are historically or culturally significant to minority or low-income communities.

Potential Affect to Environment
Refer to the effects discussions at the beginning of this chapter. Many resources were evaluated to determine the extent of environmental benefit or impact that may affect minority or low-income communities. The following resources may be of particular value to these communities: rare plants and animals, fish, hydrology, wildlife, old growth, soils scenery, air quality and heritage resources.

No adverse impacts were identified that would have a disproportionate affect on minority or low-income communities.

Wet lands and Flood lands:

There are wetlands in the planning area. Some of these wetlands and riparian areas are associated with the Clear Creek Ditch. A total of 14 acres of riparian reserves would be treated in any of the action alternatives. BMPs and Design Features for harvest in riparian areas are included in this proposal. There would be no impacts to wet lands or riparian areas from the action alternatives.

Short Term Uses and Long Term Productivity

The National Environmental Policy Act requires consideration of "the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity" (40 Code of Federal Regulations 1502.16). As declared by the Congress, this includes using all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic and other requirements of resent and future generations of Americans (NEPA Sections 101)

The Multiple Use – Sustained Yield Act of 1960 requires the Forest Service to manage national Forest System lands for multiple uses, including timber, recreation, fish and wildlife, range and watershed. All renewable resources are to be managed in such a way that they are available for future generations. The harvesting and use of standing timber can be considered a short-term use of a renewable resource. As a renewable resource, trees can be re-established and grown in again if the productivity of the land is not impaired

Marinating the productivity of the land is a complex, long-term objective. All action alternatives protect the long-term productivity of the project area through the use of specific Forest Plan standards and guides, mitigation measures and design criteria. Long-term productivity could change as a result of various management activities propose in the alternatives. Timber management activities would have direct, indirect and cumulative effects on the economic, social and biological environment. Soil and water are two key factors in ecosystem productivity, and these resources would be protected in all alternatives to avoid damage that could take years to correct. Sustained yield of timber, wildlife habitat and other renewable resources all rely on maintaining long-term soil productivity. No long term effects to soil or water resources are expected to occur as a result of timber management activities.

All alternatives would provide the fish and wildlife habitat necessary to contribute to the maintenance of viable, well-distributed populations of existing native and non-native vertebrate species. The abundance and diversity of wildlife species depends on the quality, quantity and distribution of habitat, whether for breeding, feeding or resting. Management Indicator Species are used to represent the habitat requirement of wildlife species found in the project area. By managing habitat of indicator species, the other species associated with the same habitat would also benefit. The alternatives provide standards, guidelines, and mitigation measures for maintaining long-term habitat and species productivity. The alternatives vary in degree of risk to wildlife habitat and habitat capability.

None of the action alternatives would have an effect on the long-term productivity of timber resources. Trees would be regenerated to provide post harvest productivity.

Unavoidable Adverse Effects

Implementation of any of the alternatives would result in some unavoidable adverse environmental effects. Although formation of the alternatives and mitigation measures include avoidance of some potential adverse effects, some adverse effects could occur that cannot be completely mitigated. The unavoidable adverse impacts summarized below are those that are expected to occur after the application of mitigation measures, or that cannot be mitigated completely away.

Compaction: Under the Action alternatives, additional soil compaction would occur as a result of the use of ground-based equipment to remove trees. Mitigation measures would limit the area compacted to comply with Forest Standards and Guidelines for soil protection (no more than 15% cumulative detrimental impacts). It is expected that site productivity would be maintained over time, with no perceivable or measurable loss in tree growth. See the discussion under Soil in section 3.14.

Air Quality: Project design and mitigation measures are expected to reduce the potential for air quality degradation. The potential exists for changes in atmospheric condition that could result in smoke and particulate matter to drift, causing minor, short-term impacts on air quality. All pile burning would be conducted in compliance with Oregon Smoke Management Guidelines administered by the Oregon Department of Environmental Quality. See the discussion under Air Quality in section 3.10.

Invasive plant Species: Under all action alternatives, conditions would be created that increase the risk of introduction or spread of invasive plant species. Mitigation measures would be used to reduce this risk, however, the desired open stand conditions would remain vulnerable to weed introduction. See the discussion under Invasive Plant Species in section 3.15.

Disturbance to Residence and Visitors: Implementation of activities under any of the action alternatives would cause noise, and may result in localized dust that could affect visitors and residents in or adjacent to the project area. In addition, transportation of equipment along Forest Roads may be a concern for visitors. Visitors would be notified, by signing, of activities that may affect them.

Plants or Animals: Unknown occurrences of sensitive or special interest plants could be damaged or destroyed by activities associated with all action alternatives. This would be mitigated by surveys and would not result in a loss of viability for any species. Disturbance, displacement or loss of individual fish or wildlife may occur as a consequence of harvest activities. The intensity and duration of these effects depend on the alternative selected. Most disturbance or displacement is expected to be short-term. See the discussion under Plants, Lichen and Fungi, section 3.3, Wildlife, section 3.4, and Aquatics and Fisheries, section 3.6.

Irreversible and Irretrievable Commitment of Resources

Irreversible refers to a loss of non-renewable resources, such as mineral extraction heritage resources, or to factors which are renewable over a long time span. Irretrievable refers to losses that are temporary, such as forage production in a ski area or use of renewable natural resources.

Irreversible and irretrievable effects have been addressed in the Forest Plan and the Northwest Forest Plan when this area was designated as timber emphasis, and matrix lands. There would be no irreversible commitment of resources with any of the alternatives. There would be an irretrievable loss of wood fiber with Alternative I, and to a lesser extent with Alternative IV.

Other

Comments were received which included references to research papers, reports, letters and other documents that relate to forest management issues. The commenters wanted the agency to consider this information and to make the decision maker aware of the other points of view. However, most commenters did not specify what details they wanted the agency to consider that would be relevant to the Juncrock Project. The documents have been examined and the agency is aware of the information contained in them.

Commenters referenced the following research papers.

Coats, Robert, et al. 1979. Assessing Cumulative Effects of silvicultural Activities.

Harr, R. Dennis, et al. 1975. Changes in Storm Hydrographs after Rao Building and Clear-Cutting in the Oregon Coast Range. 11 Water Resur.Res.436-44

Harr, R. Dennis, et al. 1979. Change in Steam-Flow Following Timber Harvest in Southwestern Oregon. Pacific Northwest Research station. USDA Forest Service. PNW-249

Harr, R. Dennis et al. 1989. Effects of Timber Harvest on Rain-on-Snow Runoff in the Transient Snow Zone of the Washington Cascades. Pacific Northwest Research Station. USDA Forest Service. PNW88-593

Jones, J., and G. Grant. 1996. Peak Flow Responses to /Clear Cutting and Road in Small and Large Basins, Western Cascades, Oregon. 32 Water Resur. Res. 959-74

Lyons, K., and L. Beschta. 1983. Land Use, Floods, and Channel Changes: Upper Middle Fork Willamette River Oregon (1936-1980). 19 Water Resour. Res. 463-71

Reid, M., and T. Dunne. 1984. Sediment Production from Forest Road Surfaces, 20 Water Resour. Tes. 1753-61

Johnson, D. H. and T. A. O'Neil. 2001. Wildlife-Habitat Relationships in Oregon and Washington. Oregon State University Press. Chapter 24. Decaying Wood in Pacific Northwest Forest: Concepts and Tools for Habitat management. Rose, et al. <http://nwhi.org/nhi/whrow/overview.asp

These research papers were reviewed and found to contain no new information. This information has been available for a long period of time. The analysis in the FEIS considers this information. Much of the information contained in the reports that predate 1990 was also available during development of the Forest Plan.

The following four research papers were also referenced by commenters.

Duncan, S. 1999. Dead and Dying Trees: Essential for Life in the Forest Service Findings, Nov. 1999. Pacific Northwest Research Station. USDA Forest Service.

Boleyn, P., E.Wold, and K. Byford. @000. Created Snag Monitoring on the Willamette National Forest. PSW-GTRT-181

Beschta, R., et al. 1995. Cumulative Effects of Forest Practices in Oregon: Literature and Synthesis. Prepared for the Oregon Department of Forestry. Chapter 7.

Christner, J. 1982. Appendix C: Water resource recommendation for controlling the amount of timber harvest in a sub-drainage. Willamette National Forest.

These documents were reviewed and fond to contain no new information. Within the FEIS, there is additional clarification to explain how this information was considered when making the determination of effects.

The following two letter that were address to the Regional Interagency Executive Committee were referenced in comments.

> Perry, D. A. et al. 2001. Letter from Scientists to the Regional Interagency Executive Committee. Contains recommendations regarding management of late-successional and old growth forests. September 4, 2001.
>
> Hagen, D. A. et al. 2002. Letter from Economists to the regional Interagency Executive Committee. Contains recommendations regarding management of late-successional and old growth forests. February 15, 2002

These two letters do not present new scientific information.

In the letter dated September 4, 2001 the summary states, "we believe the science is clear: saving all remaining LSOG (late successional old growth) significantly enhances the probability of LSOG-dependant species persisting through this period of extreme habitat bottleneck. Moreover, the social and economic scene in the Pacific Northwest has changed sufficiently during the 1990's to make this an acceptable and, judging from the polls, even popular decision. We hope you will give it serious consideration."

The letter dated February 15, 2002 concludes, "that there is insufficient economic justification to warrant further logging of the region's late-successional and old growth forest. We urge you to protect all remaining late-successional and old-growth forest through out the Pacific Northwest Region.

The authors are mostly environmental scientists, with experience in the Pacific Northwest and expertise that includes conservation biology, disturbance ecology, geomorphology, zoology, ecosystem science, and the ecology of lichens, fungi, invertebrates, and mollusks, as well as economists who are familiar with the situation in the Pacific Northwest. The information presented in these letters is not new science since the development of NFP. The authors present their suggested policy principles and land management recommendations based on their opinion. The NFP considered the issues presented in these letters. The NFP analyzed the probability of maintaining viable populations of organisms as well as the effect to the regional economy. An alternative was considered and evaluated when developing the NFP that did what these letters requested. The Record of Decision and the FEIS for the NFP explains the rational for the decision as well as the trade-offs and risk associated with this decision. The Juncrock FEIS is consistent with the NFP and its standards and guideline, which address the issues presented in these letters.

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Juncrock Timber Sale
Final Environmental Impact Statement

Chapter IV

Changes between Draft and Final

Minor corrections, explanations, and edits are not included in this list.

Chapter IV
Consultation and Coordination

4.1 Consultation with the US Fish and Wildlife Service (USFWS)

This proposal was consulted on with the US Fish and Wildlife Service under the 1999 Habitat Modification Biological Assessment in the Willamette Province. The USFWS concurred in a Biological Opinion with the determination that habitat modification projects in the Willamette providence are not likely to jeopardize the continued existence of the spotted owl or result in the destruction or adverse modification of spotted owl critical habitat. Terms and conditions include a seasonal restriction for spotted owls

No aquatic species or their habitat listed as Threatened or Endangered under the Federal Endangered Species Act occurs in the Juncrock planning area. Thus, no consultation is required for aquatic species with USFWS.

4.2 Consultation with the National Marine Fisheries Service (NMFS)

No federally listed anadromous fish species or their habitats occur within or near the Juncrock Planning Area. Therefore, consultation with NMFS was not necessary.

4.3 Consultation with the Oregon State Historic Preservation Officer (SHPO)

The National Historic Preservation Act requires consideration be given to the potential effect of federal undertakings on historic resources. This includes historic and prehistoric cultural resource sites. The guidelines for assessing effects and for consultation are provided in 36CFR800. To implement these guidelines, Region 6 of the Forest Service entered an agreement in 1995 with the Oregon State Historic Preservation Office and the Advisory Council on Historic Preservation. In accordance with the agreement, a survey of the projects proposed in the Juncrock Planning Area has been conducted. Based on the results of this survey, a **No Effect** determination has been made. The historic and prehistoric sites located within the planning area will be protected through measures described in section 3.12 of this FEIS. The SHPO has been consulted as to the determination made and had no objections with this finding.

4.4 Consultation with Others

Among the public contacted during the initial scoping for Juncrock were Oregon Department of Fish and Wildlife for both The Dalles and Tygh Valley offices. The Wasco County Planning Department and the City of the Dalles Watershed were also contacted. The Hood River County forester was contacted as well. No responses were received from these groups.

4.5 Responses to Scoping Comments

Approximately 225 responses in the form of letters and postcards were received. These comments came from private citizen, one federal agency and one recreation user group. Responses consisted of 114 letters and 111 cards, although the content of most of the letters was similar. Public comment addressed a wide range of topics, many of which were directed at general Forest Service Management.

Comment: Prepare a "No Old Growth" Alternative that bans the cutting of trees older than 180 years old.
Response: In general, the diameter of a tree does not indicate a trees age. Trees that grow in a wetter environment have larger diameters at a younger age than trees that grow in a drier climate. Not being able to accurately tell a trees age with out damaging the tree, an alternative was developed that does not cut trees over 21 inches in diameter. Trees over 21 inches DBH that are a safety concern along Oregon State Highway 216, FDR 2130 or the power line and trees over 21 inches DBH located in skid trails or landings would be cut.

Comment: Prepare a Restoration Alternative that uses non-commercial methods to address forest health.
Response: A Restoration Only Alternative was considered but not developed in detail. This Alternative was addressed in Chapter II.

Comment: Look at "Restoration" and other treatment names
Response: The names of treatment types have been changed to be more descriptive of the actual treatment that would be done on the ground.

Comment: Several large Ponderosa Pines are marked as wildlife trees. Why are they going to be killed to be left as wildlife trees?
Response: Trees of various species are marked with a large, very visible orange "W" to designate them as wildlife trees. Wildlife trees are not cut or killed, but remain in the stand, providing cover, habitat and shade while they are alive, habitat as they die, and snag habitat after they are dead. When the wildlife trees fall, they continue to provide habitat and nutrient recycling on the forest floor.

Comment: The hiking trail that leads into/along Unit 8 should not be turned into a road.
Response: Trail # 478 is located on what used to be an old road bed**.** This trail was developed from an existing roadbed after previous work was completed in this area. Alternatives II & III would reconstruct the original road, use it during harvest and then close the road and convert it back to a trail. Alternative IV would use a different access road into Unit 8. Access using this alternate road requires longer skid distances but would not impact the trail.

Comment: Ground based logging systems means heavy equipment that is unhealthy for roots and root mycorrizal fungus.
Response: Where possible, existing skid trails would be used, allowing for scarification after the skid trial is no longer needed. Scarification of skid roads improves compaction. The project has been designed so that no more than 15% of the area is in a detrimental condition.

Comment: Logging is a fruitless attempt to eradicate species endemic to the Pacific Northwest that will only harm our forests.

Response: We are not attempting to eliminate forest pathogens, but to bring them into a more balanced range of natural conditions.

Comment: There should be more than two alternatives.
Response: Comments from the public has resulted in the development of two additional alternatives.

Comment: FDR's 2130, 4310 & 4330 are snowmobile routes and need seasonal closures.
Response: CFR closures on specific roads are in place from December 1 to April 15. Additional road closures are out side the scope of this document.

Comment: Road 2130, as well as Highway 216, should be considered, , when leaving wildlife trees that are hazard trees
Response: None of the action Alternatives leaves as a wildlife tree, trees that are unhealthy or lean across a road.

Comment: Logging threatens several Pacific Yew trees.
Response: Pacific Yew is common in the planning area. The prescriptions do not call for harvest of Pacific Yew. Pacific yew is common and would still be in the planning area after harvest.

Comment: ATV's and OHV's cause soil compaction.
Response: OHV trails have been dedicated to these uses. Soil compaction from OHV use has been address in the McCubbins Gulch OHV Plan. This proposal does not suggest any changes in OHV management or use.

Comment: Grazing has a detrimental effect on riparian areas and native fish species.
Response: Grazing management and its effects to the environment are out the scope of the decision to make by this document. There are no proposed changed to grazing in this document.

Comment: There should be no commercial harvest on federal lands.
Response: Not harvesting timber from lands designated as timber producing is outside the scope of this document.

Comment: Consider converting roads to trails.
Response: Closed roads are available as hiking trails at this time.
Some of the comments received during the comment period included references to research papers, reports, letters and other documents that relate to forest management issues. The commentors wanted the agency to consider this information and to make the decision maker aware of other points of view. However, most commenters did not specify what details they wanted the agency to consider that would be relevant to the Juncrock Timber Sale. The documents have been examined and the agency is aware of the information contained in them.

4.6 FEIS Distribution List and Document Availability on the Internet

The Final Environmental Impact Statement or a letter of availability is being sent to the following individuals, groups and organizations. The list includes elected officials, federal agencies; state local and county governments, American Indian Tribes and Nations; other organizations, and individuals. Many of these names were on the mailing list for scoping and for the DEIS for the Juncrock Timber Sale.

In addition, the FEIS is available on the internet at: www.fs.fed.us/r6/mthood, under "projects". Copies of the FEIS, either as a hard copy or on a CD, will also be available.

Federal Agencies

Advisory Council on Historic Preservation
Agriculture, U.S. Department of
- OPA Public Stockroom
- Animal & Plant heath Inspection Service
- National Resource Conservation Service
- Policy and Planning Division
- National Agricultural Library

Commerce, U.S. Department of
- Ecology and Conservation Office
- National Marine Fisheries Service (Oregon)

Defense, US Department of
- U.S. Army Engineers Division

Energy, U. S. Department of
- U.S. Department of Energy

Environmental Protection Agency
- Office of Environmental Review
- Environmental Protection Agency

Federal Aviation Administration
Federal Highway Administration
Federal Railroad Administration
U.S. Department of Housing & Urban Development, (Oregon)
U.S. Department of the Interior
Northwest Power Planning Council
USDA Forest Service
- Environmental Coordination

Oregon Natural Resource Agencies

Department of Fish and Wildlife
Water Resources Department
Department of Environmental Quality, Bend Office
Oregon Department of Forestry, Resources Library
Governor's Forest Advisor.

County and Local Governments

Hood River County Forester

Wasco County Planning Department

American Indian Tribes and Nations

Confederated Tribes of the Warm Springs Reservation of Oregon

Other Organizations

Bark
Lobos Motorcycle Club
Mt. Hood Snowmobile Club
Oregon Equestrian Trails
Oregon Natural Resources Council
Serria Club

Individuals who Responded during the DEIS Comment Period.

Acker, Elizabeth
Adkian, Juan
Antano, Dave
Arott, Alexus
Arthur, Jody
Austin, Catherine
Auth, Joseph
Barlow, Lynn
Barth, Cartlin
Bulack, Laura
Bauer, Ken
Baum, Lisa
Beaudoin, Nic
Bloom, Alexis
Blumenberg, Amy
Boisvent, Marie
Bolt, Christine
Bostwick, Will
Boughs, Serena
Brown, Alex
Buckley, Deborah
Bumbara, Justin
Byock, Satya
Caceriai, Alex
Callahan, Andrea
Campbell, Beth
Campbell, Mike
Chaikin, Paul
Chamkl, Annie
Chelacn-Mjiddleton, Lexi
Chung, Kat
Ciolli, Jill M.
Clark, Hannah
Clark, Joe
Clark, Mathew
Cohn, Jaimie
Colby, Samantha
Colwell, Sarah
Compton, Sarah
Corkran, Char
Corkran, Dave
Couett, Anne
Coupe, David
Crosby, Sean
Dahl, Mark
Dawson, Aaron
Delmont, Matt
Dennis, Caryn
Diephuis, Andrea
Doebler, Thomas
Dolan, Jennifer
Dougan, Jean
Dyson, Mary
East, Khaleh
Eckstrand, Kya
Eisenberg, Lee
Elster, Meriel
England, Ryan
Englander, Peter
Engle, Julie
Brown, Mia
Erickson, Brian
Essman, Ryan

Evans, Ian
Fehrenbach, Elizabeth
Felsner, John
Fenyvesi, Shmu
Ferranti, Charles
Firl, Alana
Foit, Sarah
Foote,Missy
Forry, Kristina
Frank, Brian
Frankie, Jill
French, Scott
Fulmer, Noah
Gage, Laura
Garner, Jesse G.
Gavdet, Grant
Geamish, Elizabeth
Gelhl, Kyle
Gentzler, Courtney
Gerello, Laura
Glenday, Julia
Cessutt, Jamie
Graves, Deanna
Griskey, Richard
Pratt, Abby
Grogan, Alan N
Gunderson, Stephen
Haddon, Liza
Hamilton, Melissa
Harrison, T. Jane
Heldlund, Krista
Heyn, Katie
Holmes, Jenny
Hooper, Ryan
Howland, Craig
Jan, Erin
Libor, Jany
Jazar, Jessica
Jobanek, Jessica
Johnson, Erika
Judkins, Andy
Jussell, Elizabeth
Kain, G.
Kanfman, Albert
Karleskint, John
Kasavana, Brian
Kipilman, Jeff
Kleinhammer, Ashlee
Krall, Kathleen
Krebs, Jennifer
Kruse, Ma
Kunsman, Stephanie
Lanhyam, Melissa
Lany, Amelia
Lapotre, April
Larowe, Peter
Larowe, Sandy
Laurrieux, Stephanie
Jarrett, Aaron
Laviolette, Linda
Leah, Justin
Ledesma, Jerry
Lee, Jessica
Leton, Mike Nett
Lewis, Elizabeth
Lewis, Hannah
Lockwood, J.C.
Maki, Jennifer
Mare
Martin, Jessica
Martin, Shannon
Mathews, KeithJ.
Mathou, Sunshine
Matson, Laura
MC
McAleir, Emily
McBain, Kate
McIver, Elsie
McKinley, Michael
McQuian, Martie
Mearey, Jenna
Merriman, Pauli
Mildrexler, David
Miller, Adam
Miller, Brooke
Miller, Dianne
Milnttie, Sarah
Mloeueft, David
Moore, Zephyr
Morkan, Burditt
Mublin, Ann
Mujenkiis, Marian
Murphy,Carole
Murphy-Ellis, Emma
Murphy-Ellis, Silas
Muzi, Paul
Narelue, Nima
Nathan, Sheila
Nelson, K.
Nelson, Mike
Noth, Marcia
O'Brady, Alisha
O'Brien, Ingrid
O'Conner, Katie
Orwick, Briita

Pandu, Erin
Park, Sorina
Parrella, Rosanna
Patl, Ameita
Payne/Swayth, Merlin
Pechanse, Martin
Petler, Margot
Phyllis Kirk
Pierce, Ryan
Pollett, Gereld
Potts, Iris
Power, Eleanor
Proctor, Grady
Rahman, Sarah
Ramsey, Mary
Ramwren, Sarah
Rathbin, Jaica
Rudd, Courtney
Saeman, John
Sampson, Caitlin
Sanders, Paul
Scelza, Jay
Scheinberg, Sandi
Schept, Elizabeth
Helfmeyer, Malia
Schwartz, Marian
Schwdel, Michael
Seluzicki, Adam
Senkyr, Lauren
Shannon, Patrick
Shapiro, Natalie
Shardone, Laura
Shashai, Jedidiah
Shimmon, Kathryn
Siff, Melynda
Sila, Julie
Sjogren, Karen
Skar, Rolf
Skiftenes, Stacey
Snyder, Janice
Solomon, Laurie
Stephens, Don
Stephenson, Kim
Stevens, Margaret
Stirr, Kate
Stovtz, Sasha
Streter, Coby
Sullivan, Keri
Szackal, Vanessa
Taylor, Mary
Timimmesch, Mary
Trenk, Gill
Troy, Do
Ulhtman, Louisa
Ullman, Talia
Upjohn, Jennifer
Van, Paul
Vogel, Vanessa
Volpe, Craig
Wald, Sarah
Walters, Vanessa
Warlick, Billy
Warren, Joseph
Weiss, Gabriel
White, Hayden
Whittemore, Amie
Willey, Anthony
Wise, Cynthia
Wolf, Rhea
Yeaman, James
Zaret, Kyla
Zotter, Michael

A Response to Comments, is located in Appendix N.

4.7 List of Preparers

The following is a list of Interdisciplinary Team (IDT) members who assisted in the development of this Final Environmental Impact Statement.

Table 4-1 List of Prepares

NAME	EDUCATION AND EXPERIENCE	RESOURCES/ SPECIALTY
Pat Haley	Education: BS -- Forest Management, Oregon State University Experience: 23 years Forest Service, 3 years BLM,	Silviculturist (9 years as certified Silviculturist)
Rich Thurman	Education: BS -- Wildlife Management, Oregon State University Experience: 27 years with the Forest Service	Wildlife Biologist
Lance Holmberg	Education: MA in Biology BA in Natural Resources Humbolt State University Experience: 12 years with the Forest Service	Botanist
John Dodd	Education: BS -- Soils Science and Land Use, Oregon State University Experience: 15 years with the Forest Service	Soil Scientist
Chris Rossel	Education: BS -- Fisheries Science, Oregon State University, Experience: 9 years with the Forest Service	Fisheries Biologist
Dennis Beechler	Education: AA -- Natural Resources, Fox valley Technology College, WI, Experience: 30 years with the Forest Service	Recreation & Scenic Resources
Dan Fissell	Education: BS -- Agriculture/ Range Management, Cal State University, Chico Experience: 13 years with the Forest Service, 4 years with BLM	Range Conservationist & Noxious Weeds
Ken Huskey	Education: AS Civil Engineering Technology, Mt Hood Community College Experience: 32 years with the Forest Service	Transportation Planner
Joel Pomeroy	Education: BS -- Forest Management, Humbolt State University Experience: 20 years experience with the Forest Service	Fire and Fuels and Air Quality

Mike Dryden	Education: BS -- Anthropology, Oregon State University Experience: 16 years FS, 5 years private contractors doing archeological work.	Heritage Resources
James Rice	Education: BS – Forest Science, Humbolt State University. Experience: 25 years with the Forest Service	Silviculturist (16 years as certified Silviculturist)
Diane Hildebrand	Education: PhD & M.A.— Environmental Biology, University of Colorado, Experience: 19 years with the Forest Service,	Plant Pathologist
Becky Nelson	Education: BS of Forestry, Northern Arizona University Experience: 28 years with the Forest Service	Writer Editor

4.8 References

The following is a list of references and consultations used during the analysis of this project.

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Personal Communication, Patti O'Toole, CTWS Fish Biologist, August 2002

Personal Communication, Mike Weldon, CTWS Fish Biologist, August 2002

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USDA Forest Service, **,** *7700 - Transportation System:, 7700 - Zero Code, 7710 – Transportation Planning, 7720 – Development, 7730 - Operation and Maintenance, 7740 - Federal Lands Highway Programs.* USDA Forest Service

USDA Forest Service, *7700 - Transportation System: 7709.55 - Transportation Planning Handbook, 7709.56 – Road Preconstruction Handbook, 7709.56b - Transportation Structures Handbook 7709.57 - Road Construction Handbook 7709.58 - Transportation System Maintenance Handbook, 7709.59 - Transportation System Operations Handbook*, USDA Forest Service

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4.9 Index