

# Chapter 2

## Alternatives

CHAPTER 2 INTRODUCTION .....	2-2
SCOPING AND PUBLIC INVOLVEMENT .....	2-2
IDENTIFICATION OF ISSUES .....	2-3
<i>KEY ISSUE: CHANGES IN MOTORIZED ACCESS</i> .....	2-3
<i>KEY ISSUE: ECONOMIC EFFICIENCY AND ECONOMIC OPPORTUNITIES</i> .....	2-4
<i>KEY ISSUE: EFFECTS ON SOILS, WATERSHEDS, AND AQUATIC HABITAT</i> .....	2-5
<i>KEY ISSUE: EFFECTS ON WILDLIFE HABITAT</i> .....	2-6
<i>KEY ISSUE: RECOVERY USING A LIMITED-INTERVENTION APPROACH VS. RECOVERY USING A FULL RANGE OF ACTIVE MANAGEMENT PRACTICES, INCLUDING COMMERCIAL SALVAGE</i> .....	2-7
ANALYSIS ISSUES .....	2-8
ALTERNATIVE DESCRIPTIONS .....	2-9
ALTERNATIVE A - (NO ACTION) .....	2-11
ACTIONS COMMON TO ALL FULLY ANALYZED ACTION ALTERNATIVES .....	2-12
ALTERNATIVE C .....	2-23
ALTERNATIVE D .....	2-29
ALTERNATIVE E .....	2-33
ALTERNATIVE G (PREFERRED) .....	2-37
ALTERNATIVE H .....	2-42
MITIGATION AND RESOURCE PROTECTION MEASURES .....	2-46
MONITORING .....	2-58
ALTERNATIVES AND DESIGN ELEMENTS CONSIDERED BUT NOT FULLY ANALYZED .....	2-59
COMPARISON OF ALTERNATIVES .....	2-65

## CHAPTER 2 - ALTERNATIVES

### Introduction

This chapter describes the public involvement process and identifies key issues around which alternatives were developed. It describes the alternatives considered, the mitigation measures, and references the monitoring approach. A summary of the manner in which the alternatives respond to the purpose and need and to the issues, followed by an issue-related effects comparison, is displayed at the end of this chapter.

### Scoping and Public Involvement

The National Environmental Policy Act (NEPA) process and the associated Forest Service implementing regulations provide for an open public involvement process. The NEPA phase of a proposal begins with public and agency scoping. "Scoping" is the term used to describe how the Forest Service collects public input in the environmental analysis process. Through scoping, the public is notified of and asked to comment on a management proposal. Comments provided by other agencies and members of the public help to identify issues. Active public involvement throughout the process reduces delays and leads to better decisions.

The Toolbox Fire Recovery Project was initially introduced to Klamath Tribal representatives at the August 2002 "pre-SOPA meeting" (SOPA is the acronym for "Schedule of Proposed Actions"). The SOPA is an official quarterly newsletter, also known as the "Fremont-Winema Flyer," which announces new projects that are being considered and updates the status of previously listed projects. Under the terms of the 1999 "Memorandum of Agreement between The Klamath Tribes and the U.S. Forest Service" (U.S. Forest Service and Klamath Tribes 1999), projects that will be newly listed on an upcoming SOPA are first subject to pre-public scoping consultation. Such new projects are often introduced at quarterly "pre-SOPA" meetings scheduled approximately two months prior to the public release of the SOPA.

Following the introduction of the project, the Klamath Tribes Natural Resource Department assigned Rick Ward, Tribal Biologist, as the department's representative for the project. Mr. Ward was involved with the interdisciplinary team during the initial drafting of the proposed action during October and November 2002. In October 2002, Elwood Miller Jr., The Klamath Tribes Natural Resources Director, granted the Forest Service request to proceed with expedited public scoping as outlined in the 1999 Memorandum of Agreement. During this same time period, Gerald Skelton, The Klamath Tribes Culture and Heritage Director, began direct communication with the Cultural Resource specialists on the Toolbox Interdisciplinary Team. This resulted in cultural resource field reconnaissance crews being assembled that were jointly composed of personnel from the Klamath Tribes and the Fremont-Winema National Forests. These crews performed inventories for approximately nine weeks during the fall of 2002. Surveys using a similar make-up began again in late spring 2003.

In addition to ongoing technical consultation between Forest Service technical and professional staff and tribal counterparts, updates on the project were provided to Klamath Tribal representatives at the November 2002, February 2003, May 2003 and August 2003 pre-SOPA meetings. During internal Forest Service review of the draft of the DEIS (June 10, 2003 to August 1, 2003), complete copies of the draft document were provided for Klamath Tribal review, concurrent with internal Forest Service review. Specific concerns that were raised through the sum of all consultation with The Klamath Tribes pertained to road management considerations within former Klamath Reservation lands, cultural resource protection, and mule deer habitat (particularly winter and transition range).

Once a specific set of management activities was formulated into a proposed action, public scoping was initiated. A Notice of Intent to prepare an Environmental Impact Statement was published in the Federal Register on November 1, 2002. News releases were published in area newspapers in November and December 2002. The proposed action was contained in a scoping packet that was initially mailed to the public and other agencies for comment on November 12, 2002. As the public outreach process provided additional names of interested persons, the scoping packet was subsequently mailed to additional addresses through late December 2002. These mailings were sent to congressional and local governmental representatives, tribal governments and staff, area post offices, adjacent landowners, government agencies at all levels, conservation and environmental organizations, livestock and timber industry representatives, and other private individuals that are on the Silver Lake Ranger District NEPA mailing list. Organizations or individuals who were not previously on the list, but who were known to have an interest in projects such as the Toolbox project in regard to neighboring National Forests were added to the Silver Lake Ranger District NEPA mailing list. A total of 214 individuals or organizations received scoping packets. The proposal has also been listed in four consecutive issues of the quarterly Schedule of

Proposed Actions up through the Summer 2003 issue. All press releases, as well as the Toolbox Fire Recovery Project proposed action and the SOPA, included the notice that project information was available at the following website:

<http://www.fs.fed.us/r6/winema/management/analyses/toolbox/index.shtml>

Open Houses were held in Christmas Valley and La Pine, Oregon on May 12 and 13, 2003. These open houses were used to introduce the alternatives to the public and provide participants with the opportunity to ask questions and submit comments. Materials that had been presented at the open houses were also posted on the website.

Written comments, letters, electronic mail responses or phone calls were received from 15 individuals, agencies, businesses, and organizations during scoping. All comments were read by the ID Team and other staff to ensure consideration of every comment at some point in the analysis process. The complete record of the public involvement process to date is available for review in the project file.

## Identification of Issues

Issues are points of discussion, debate, or dispute about environmental effects that may occur as a result of the proposed action or an alternative. Issues provide focus and influence alternative development, including development of mitigation measures to address these *potential* environmental effects, particularly potential negative effects. Issues are also used to display differing effects between the proposed action and the alternatives regarding a specific resource element.

The ID Team sorted the comments received during initial scoping into categories to help issue tracking and response. The issues are categorized as follows:

- **Key issues:** Issues used to develop the alternatives and design activities to carry out the action alternatives. Typically this involved consideration of the issue and potential responses to the issue in varying ways that would still contribute toward meeting Purpose and Need.
- **Analysis issues:** Issues addressed in the effects analysis and used to compare alternatives, though they did not result in differing design elements between alternatives. These issues are generally less focused on the elements of Purpose and Need, than are the Key Issues. However, due to their importance in providing the Responsible Official with complete information, they are identified in Chapter 2 and analyzed in Chapter 3.
- **Issues not addressed in detail:** Issues, concerns or opinions that are:
  1. Addressed by mitigation in all alternatives
  2. Addressed through adherence to standard policies (such as Fremont National Forest Land and Resource Management Plan (LRMP) Standards and Guidelines, established Memorandum of Agreement, or other policy)
  3. Beyond the scope of this project, including issues that provide only minimal opportunity to respond to Purpose and Need.

See Appendix F for determination of *issues not addressed in detail*. The project planning record documents the initial scoping content analysis at: “2003\_07\_18\_Content\_Analysis\_of\_Initial\_Scoping\_Responses.doc”.

## Key Issues

The alternatives respond to the following key issues identified during initial project scoping, both public and internal. The key issues are specific to the proposed actions and the project area. Indicators for each issue will help to evaluate how each of the alternatives addresses issues. Indicator evaluations are provided later in this Chapter in the “Comparison of Alternatives” section.

### ***Key Issue: Changes in Motorized Access***

**Issue Statement:** Proposed road management activities (closure and decommissioning) would reduce public access for recreation and personal use fuelwood gathering. The proposed action would also reduce opportunities for members of the Klamath Tribes to use motorized vehicles to hunt or gather Treaty Right resources within former Klamath Reservation boundaries, using motorized vehicles.

The Proposed Action included a mapped display of specific road management proposals, based on the most complete information available at the time of initial scoping, most of which was limited to the Silver Fire portion of the project area. Proposals included approximately 35 miles of road decommissioning to promote watershed recovery. Decommissioning is defined as “activities that result in stabilization and restoration of unneeded roads to a more natural state” (36 CFR 212.1), (FMS 7703). In addition, the Proposed Action indicated that an ongoing road condition survey within the fire area would lead to recommendations for road management, following an area Roads Analysis (which was subsequently completed). These recommendations, including additional decommissioning and closures would then be incorporated into alternatives during the alternative development process. There is concern that the road rehabilitation activities, designed to improve watershed conditions, would reduce access for recreation and personal use fuelwood gathering. Opportunities for members of the Klamath Tribes to hunt or gather Treaty Right resources using motorized vehicles would be reduced on the part of the Silver Fire within former Klamath Reservation boundaries. Approximately 2,065 acres within the project area are within former Klamath Reservation boundaries. Some people expressed opposition to **any** loss of motorized travel opportunities. Some people questioned whether road decommissioning would actually promote watershed recovery. Conversely, some input indicated that there should be a thorough program of decommissioning and closure in order to protect watersheds and wildlife.

### **Issue Indicators**

The following indicators will be evaluated for each of the alternatives:

1. *Open Road Density (miles per square mile), including separate reporting for former Klamath Reservation land*
2. *Miles of Road Left Open, Closed and Decommissioned, including separate reporting for former Klamath Reservation lands*

### ***Key Issue: Economic Efficiency and Economic Opportunities***

**Issue Statement:** There were concerns expressed about the overall economic return of the proposals included in the proposed action. Some commenters felt the cost effectiveness of the project could be reduced by including restoration proposals other than commercial salvage, and by including helicopter yarding for a portion of the commercial salvage. Some people want the Forest Service to maximize economic opportunities by timely salvage of fire-killed trees. They urge the Forest Service to, “Harvest as much of the merchantable timber as quickly as possible.” This time element did not influence alternative development, because regardless of alternative construction, the legally mandated process and required timeframes for project planning on National Forests remains the same. There were also specific concerns about how the economics of helicopter yarding would affect the overall timber sale economics, including the concern that, “By next year, due to deterioration, the value won’t support (use of) helicopter.” There was concern that the proposed action included salvage of merchantable material more as a “reluctant inclusion” rather than as the “underpinning” of the action.

There was concern that the watershed, riparian and wildlife restoration projects, the plantation thinning, site preparation and planting at over 300 trees per acre or extensive non-commercial fuels reduction could incur very high costs, while the only actual “return” producing activity was the commercial salvage.

The Forest Service budgeting process and the timber sale appraisal process, travel to a large extent on different tracks, so that while some of these actions relate directly timber sale viability, others are pertinent only within a larger general concern over expenditure of public funds. Taken as a whole, this group of concerns, some of which relate directly to timber sale economic viability and some of which do not, will be examined by comparing the alternatives in terms of overall economic factors and for a subset of these factors (timber sale economics).

### **Issue Indicators**

The following indicators will be evaluated for each of the alternatives:

1. *Estimated Salvage Harvest Volume (MMBF)*
2. *Percentage of Harvest Volume by Ground-Based Yarding System/Helicopter Yarding System*
3. *Comparative Timber Sale Economics (Net Timber Value/mbf and Total)*
4. *Job Support (Total, including Direct and Indirect)*
5. *Present Net Value (PNV, for Current Projects only, at 4% Discount)*

## ***Key Issue: Effects on Soils, Watersheds, and Aquatic Habitat***

**Issue Statement:** The proposed salvage and connected actions, including temporary road construction, could potentially have adverse effects on watershed and riparian function and cumulatively contribute to adverse effects on soils.

**Proper functioning condition**, as described by the National Riparian Team and defined in "Riparian Area Management: Process for Assessing Proper Functioning Condition" (USDI 1995, PFC manual), is described as *meeting the minimum conditions for a riparian area to function properly*. "Riparian areas are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality; filter sediment, capture bedload, and aid floodplain development; improve flood-water retention and groundwater recharge; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and support greater biodiversity." Proper functioning condition, or *functionality*, can be determined for a variety of parameters that pertain to vegetation and channel characteristics, listed below under Issue Indicators.

Concern has been expressed that potential adverse affects as a result of salvage or other activity on watershed functioning and riparian conditions and on soils (fertility, compaction or erosion/sediment), outweigh economic reasons for the recovery of forest products. The potential impacts of salvage activity, grazing, and new roads, as well as the appropriateness of conifer planting in floodplains, were all raised as concerns. Some respondents believe the Forest Service would better achieve restoration and recovery of these resources by placing the emphasis on road decommissioning, native species recovery, stabilizing soils and implementing limited contour felling that leaves the largest trees standing.

INFISH standards and guidelines (a 1995 amendment to the LRMP) state that salvage activity within Riparian Habitat Conservation Areas (RHCAs) can occur only where present and future large woody debris needs would be met, and where cutting would not retard or prevent attainment of other Riparian Management Objectives, and where adverse effects can be avoided to inland native fish.

### **Issue Indicators**

The following indicators will be evaluated for each of the alternatives:

1. *Watershed and Riparian Effects, by determining the effect (Restore; Maintain; Degrade) on the functionality of:*

*Uplands*

*Roads*

*Canopy*

*Soil*

*Riparian Vegetation and Bank Stability*

*Channel Condition*

*Pool frequency,*

*Large Wood Frequency*

*Temperature*

*Fine Sediment*

*Fish Passage*

2. *Soils, including measures of:*

*Fertility*

*Sediment Risk (including the contribution of roads to sediment transport)*

*Compaction*

3. *Amount of Soil and Riparian Protection and Restoration Activity (miles or acres) and assessment of effects, including sediment reductions (tons/year) from Road Decommissioning*

4. *Attainment of INFISH Riparian Management Objectives – Yes or No*

## ***Key Issue: Effects on Wildlife Habitat***

**Issue Statement:** Habitat for snag and down wood dependent species could be negatively impacted by commercial salvage operations through the removal snags. Fuels reduction in the proposed action that includes the use of prescribed fire could negatively impact mule deer habitat by reducing cover.

The Toolbox Complex fires had a complex array of effects on wildlife habitats and now present a wide variety of opportunities to restore or enhance those habitats. Two primary habitats emerged as key issues: snag/down wood and mule deer.

Snags and Down Wood - Many wildlife species rely on moderate to high levels of snags and down logs for nesting, roosting, denning, and feeding. The abundance and usefulness of the snag habitat component, particularly for snag and down wood dependent species, could *potentially* be negatively impacted by salvage operations. In order to provide increased longevity for snag and down wood dependent species habitat, a respondent urged that the largest dead trees within each given site be retained, as these large trees would likely remain standing the longest.

Fremont National Forest LRMP standards and guidelines for snags and downed wood are designed to provide the amount of snags and downed wood required for 100 percent of potential population levels of primary cavity excavators. Recent science, represented by “*DecAid*” (or the “Decayed Wood Advisor for Managing Snags, Partially Dead Trees, and Down Wood for Biodiversity in Washington and Oregon” (Mellen, 2002), is used to examine effects on snag and down wood-dependent species.

The Toolbox and Silver Fires have created optimal habitat for black-backed woodpeckers in areas of high canopy closure pre-fire with high densities of smaller trees. Black-backed woodpecker habitat areas were identified during post-fire inventories by selecting areas meeting the habitat qualities for which black-backed woodpeckers select (Saab et al., 2002). Using GIS and ground verification, areas were identified that had high pre-fire crown closure and experienced high mortality from the fire. These stands are between 67 and 287 acres totaling approximately 1,789 acres of black-backed nesting habitat in 12 locations distributed across the project area.

The Toolbox and Silver Fires have created optimal habitat for Lewis’ woodpeckers in areas with abundant large ponderosa pine. Lewis’ woodpecker areas were also identified during post-fire inventories by selecting areas meeting the habitat qualities for which Lewis’ woodpeckers select (Saab et al., 2002). Using GIS, stand data, and ground verification, areas were located that had low to moderate crown closure pre-fire and had high densities of large ponderosa pine. These stands are between 5 and 43 acres in size, totaling approximately 900 acres of Lewis’ woodpecker nesting habitat in approximately 50 different locations well distributed across the Toolbox and Silver Fires.

See Chapter 3 “Wildlife” for a full discussion of habitat for snag and down wood dependent species.

Mule Deer - Another habitat component that could be affected by the proposed activities is mule deer cover and forage. A primary concern that surfaced during scoping was that pre-treatment for prescribed fire (small diameter tree felling, sometimes referred to as “slashing” or “whip felling”) and subsequent application of prescribed fire could negatively impact such habitat, through a reduction in cover. In order to maintain mule deer habitat, some respondents urged no loss of cover from activities and no prescribed burning in bitterbrush areas, as well as the active seeding or planting of mountain mahogany. Some respondents suggested that no application of prescribed fire should be implemented in order to protect remaining small diameter green trees.

Road management proposals also received comments regarding wildlife habitat, with the recommendation that decommission was preferable to closure. Further, some commented that maximum road densities should be 1.0 miles per square mile in mule deer winter range, 2.5 miles per square mile in mule deer summer range and 1.5 miles per square mile in old growth dependent species habitat.

In considering the effects of the alternatives on wildlife habitat, both short-term habitat effects and long-term sustainability or persistence will be examined.

## **Issue Indicators**

The following indicators will be evaluated for each of the alternatives:

*Snag and down wood Dependent Species Habitat Retained (acres of identified optimal habitat) from amongst 1,789 acres of identified optimal black-backed nesting habitat; and 900 acres of identified optimal Lewis' woodpecker nesting habitat)*

*Mule Deer Habitat (Habitat Effectiveness and % cover)*

### ***Key Issue: Recovery using a limited-intervention approach vs. Recovery using a full range of active management practices, including commercial salvage.***

**Issue Statement:** This issue embodies divergent public input on which overall approach to recovery best accomplishes actual recovery and restoration. Some commenters believe that recovery and restoration would be better achieved through an approach that did not include the proposal to commercially salvage fire damaged trees. Others believe recovery and restoration would be better achieved through an approach that allows for commercial harvest of salvage-eligible fire damaged trees.

**Limited Intervention** - A suggestion was made, citing the “Beschta Report”, that as an alternative to the proposed action, a “restoration-only” alternative (recovery without commercial salvage) should be considered. The 1995 Beschta Report presents suggested general policy principles and land management recommendations for post-fire strategies for lands throughout the interior Columbia and upper Missouri basins. As such it does not specifically consider the site-specific conditions on the Toolbox Complex fires. Primary Beschta Report resource topics include potential impacts due to salvage (as opposed to “natural recovery”) on soil (both compaction and erosion – *measured under another key issue*); habitat for snag and down wood nesting species – *measured under another key issue*; loss of structurally and functionally important large woody debris, and logging in sensitive areas such as severely burned areas with litter destruction, roadless areas, riparian areas and steep slopes – all considered under other key, analysis issues or Chapter 3 resource area effects analysis. These factors are also discussed in later in Chapter 2, under “Alternatives and Design Elements Considered But Not Fully Analyzed”.

The Beschta Report is centered on the common theme that natural patterns and processes provide the best pathway to recovery, and that, “Human intervention on the post-fire landscape may substantially or completely delay recovery.” In other words, it recommends an approach that is in substantial agreement with a (passive) ‘restoration-only’ alternative, as was suggested during project scoping. The Beschta Report contains recommendations (in the event that salvage is undertaken) that include leaving 50 percent of standing dead trees, prohibiting yarding systems that rely on tractors and skidders, seeding/replanting only after several years of evidence that natural regeneration has not occurred, and determining the need to undertake road maintenance, improvement or obliteration.

**Active Management** - On the other hand, some respondents suggested that forests needed to be managed to “stop destructive fires” and “in order to prevent a Toolbox II”. This approach suggested that fuels treatments, including salvage of dead and dying conifers, were critical. Further, these respondents felt that the “less than 20 percent bright green crown” criteria for considering eligibility for salvage was too low and that a 50 percent criteria would do more to address future fuel loading and insect infestation. Input was also received that suggested that the proposed amount of fuels treatment in Riparian Habitat Conservation Areas was inadequate if long-term sustainability of late and old structural (LOS) conditions was to be achieved in such areas. Sustainability refers to maintaining the composition, structure and processes of an ecological system (USDA Forest Service, Committee of Scientists Report, Chapter 3, Page 19; March 15, 1998). Sustainability increases as forests take on characteristics that allow them to withstand rapid and widespread change in structure due to fire, insects and disease.

## **Issue Indicators**

For this project, recovery is defined as the long-term development of sustainable LOS conditions. Recovery of sustainable forests in areas that have burned depends first on reforestation occurring, either through natural means or planting, and then maintaining conditions that sustain the forest through time (i.e. do not contribute to stand replacement fire). The following indicators will be evaluated for each of the alternatives:

*Fuel loading (tons per acre), its influence on future fire behavior and ability for initial attack to successfully suppress at the pre-stand replacement stage (Fuel Model, Resistance to Control - flame length and rate of spread).*

*Acres of forest that would be managed under each of three management scenarios, by alternative, by mortality class. The scenarios include actions that are included in varying amounts in the alternatives, as well as projected future actions that would be used through 50 to 100 years to promote LOS development. The three scenarios range from: no/harvest/no fuels treatment up to active management including harvest, fuels treatment, planting, and future precommercial thinning/underburning/commercial thinning. The effects of each scenario in terms of attainment of LOS conditions will be described and measured as:*

*Acres, by alternative, that receive the combination of actions that would most likely result in future sustainable LOS stands*

## **Analysis Issues**

Other than the issues described above, several issues or concerns were raised during project scoping, either externally or internally, which were not used as key elements to develop the alternatives. These issues are generally less focused on the elements of Purpose and Need, than are the Key Issues. However, the effect of the alternatives regarding these issues was considered during the analysis and is disclosed in Chapter 3 “Environmental Consequences”:

Several of these analysis issues, for instance “Wildlife”, represent specific aspects of a general resource area that differ from the elements that were captured above under “Key Issues”

### 1. Wildlife

This includes:

- Management Indicator Species (MIS), including old growth dependent species – a total of 5 species (mule deer and snag and down wood dependent species, both MIS, are captured under “Key Issues”)
- Threatened, Endangered, Candidate and Sensitive Species (TES) – a total of 21 species
- Focal species identified for the Subprovince Central Oregon/Klamath Basin in the *Conservation Strategy for Landbirds of the East-Slope of the Cascade Mountains in Oregon and Washington* (Altman 2000) – a total of 12 species
- Other species and habitats of concern – a total of 6 species or habitats

#### Indicators

- For all of the above: A narrative, comparative discussion of existing condition, direct, indirect and cumulative effects.
- For TES and Candidate Species – In addition to the narrative comparison of effects, a *determination of effect:*

#### Threatened or Endangered Species

NE = No Effect from the project on the species or critical habitat.

LAA = The project may affect and is likely to adversely affect the species or critical habitat.

NLAA = The project may affect the species or critical habitat, but those effects are not likely to adversely affect the species or critical habitat

BE = The project would benefit a species or its habitat.

#### Candidate or Sensitive Species

NI = No Impact

MIH = May impact individuals or habitat, but would not likely contribute to a trend toward federal listing or loss of viability to the population or species.

### 2. Cultural and Heritage Resources

Indicator – Potential for impacts on cultural resources by: a.) project activity; b.) future high intensity fire; and c.) illegal gathering. Potential rated as “none”, “low”, moderate” or “high”, by alternative.

### 3. Non-Motorized Recreation

Indicator – Amount of road decommissioned or closed (miles), an indirect measure of increased opportunity for recreation in a non-motorized environment, by alternative. In addition, a narrative evaluation of the effects of the alternatives on the Fremont National Recreation Trail is included in Chapter 3.

#### 4. Environmental Justice

Indicator – A narrative consideration of any potential for disproportionate impacts on minority and low-income populations, as a result of the proposals, is included in Chapter 3.

#### 5. Noxious Weeds

Indicator – A rating of comparative risk of noxious weed introduction or spread, by alternative, based on the factors that both increase risk (ground disturbance, temporary road construction) and decrease risk (planting/reforestation, reduction of open road density and fuels treatment/reduction of the risk of fire). In addition, a narrative evaluation of the effects of the alternatives, in light of risk factors.

#### 6. Unroaded Lands

Indicator – Area specific quantities of activities, by alternative, that would occur within unroaded areas, including commercial salvage (acres), temporary road construction (miles) and road decommissioning (miles).

#### 7. Air Quality

Indicator – Tons of particulate emissions by treatment type, by alternative.

The environmental consequences and “anticipated effects” of each of the alternatives is considered in Chapter 3, by resource area, in light of LRMP standards and guidelines. In this fashion, additional internal issues or concerns that arose during the analysis, but were not specifically identified as key issues or analysis issues, are considered and evaluated.

## Alternative Descriptions

Eight alternatives were considered. Six of these eight were fully developed and analyzed. These six are fully described in this chapter. They are compared in summarized form in this Chapter, with further disclosures of environmental consequences in Chapter 3. The eight alternatives are:

- Alternative A – No Action. Fully analyzed. Alternative description is included below.
- Alternative B – Original Proposed Action (see “Alternatives Considered But Not Given Detailed Study” later in this chapter).
- Alternative C – Modified Proposed Action. Fully developed and analyzed. Alternative description is included below.
- Alternative D – Fully developed and analyzed. Alternative description is included below.
- Alternative E – Fully developed and analyzed. Alternative description is included below.
- Alternative F – See “Alternatives Considered But Not Given Detailed Study” later in this chapter
- Alternative G (**Preferred**) – Fully developed and analyzed. Alternative description is included below.
- Alternative H – Fully developed and analyzed. Alternative description is included below.

The alternatives have not been given descriptive titles, other than letter designations. They were developed based on varying responses to the key issues discussed above, with actions that respond to meeting purpose and need and design features and mitigation requirements related to the issues and public concerns. When alternatives are identified below as responding to specific key issues, this indicates that response to that issue or issues was a primary or a substantial focus in the design of that alternative. It does not necessarily mean that the alternative paid no heed to the other key issues. In fact, design elements that respond to some extent to all issues are included in most alternatives. The extent to which an alternative responds to a given issue is disclosed in the “Comparison of Alternatives” section of Chapter 2 and in the resource-by-resource discussion of “Environmental Consequences” in Chapter 3.

The following major actions are discussed, particularly as they differentiate the alternatives:

- Commercial Salvage (General)

Relatively small ‘subsets’ of General Salvage include:

Roadside Hazard Salvage (both inside of and outside of Riparian Habitat Conservation Areas)

Commercial Salvage in Riparian Habitat Conservation Areas (not in Roadside Hazard Corridors)

- Snag Retention

- Precommercial Thinning
- Reforestation (Planting)
- Fuels Treatments and Reductions
- Prescribed Fire
- Road Management (Decommissioning and Closure)
- Temporary Road Development
- Road Reconstruction
- Soil and Riparian Protection and Restoration Projects:
  - Aspen Enhancement
  - Placement of Large Woody Debris (LWD)
  - Deciduous Planting
  - Road 2917413 Drainage Improvement

In addition, the need for adoption of a **Forest Plan Amendment** in order to implement each alternative is discussed.

Tables following the alternative-by-alternative discussion provide a summary comparison of activities included in each alternative.

### **Precision of Information and Adjustments**

Acres, miles, other quantifiable amounts and mapped unit boundaries used to describe these alternatives are based on the best available information. The analysis presented in this DEIS is based on consideration of the full extent of the acres, miles and other quantities depicted in the alternatives. Information used in designing the alternatives was generated from a mix of extensive field reconnaissance, use of ortho-photos and complete post-fire aerial photo series, use of Global Positioning System (GPS) technology, and various resource specific databases. Ongoing field verification during the summer of 2003, including additional use GPS, is expected to result in adjustments in acreages or possibly other elements, such as mitigations. As the EIS is being prepared, additional reconnaissance in the areas listed below is occurring to insure accuracy of final product. In addition, factors that relate to the natural progression of mortality through time are occurring. Overall, it's expected that the magnitude of these adjustments would be within about 10% to 15% below (but not above, except for planting) the acreage and other numbers reported in the DEIS.

- Cultural resource site locations (minor areas yet to be inventoried) – Results of completed surveys may reduce the area of proposed salvage, or other, activity.
- Merchantability - As material deteriorates, the mix of volume, between sawtimber and fiber, would begin to trend in the direction of fiber. If there is an unfavorable fiber market, then some of the harvest units may not be offered due to market conditions.
- Riparian Habitat Conservation Area (RHCA) boundaries - There will be a review of the GIS procedures used in determining the mapped locations of the RHCA's, particularly of Category 3 and Category 4 RHCAs. Final field verification of RHCA category (Category 3 and Category 4) is ongoing. The descriptions of the RHCA categories, in the Chapter 2 descriptions and the protective measures in relation to width of harvest, no harvest, and equipment exclusion will not change. For instance, in Category One RHCAs (perennial fish bearing streams) the protective measure: "in the outer 100 feet of the RHCA (which are typically 300 feet wide, or wider, in slope distance beyond the edge of the active stream channel, on each side of the stream) salvage harvest of selected trees or clumps (may occur)... No salvage would occur other than in the outer 100 feet of RHCA. No mechanized ground-based equipment would be allowed within the entire width of the RHCA...." (see full descriptions later in this chapter. Instead, the adjustments would be limited to changes resulting from the review of GIS mapping procedures and a field verification of RHCA categorization.
- Post-fire goshawk habitat (seasonal surveys of potential habitat)
- Logging system planning and Right-of Way or access needs (final field verification)

- Area to be reforested – The extent of reforestation within the 34,000 acres considered for planting (in all action alternatives) is based on current condition. Those conditions led to the proposal to plant approximately 20,800 acres in each of the action alternatives. A change in mortality level, such as increased mortality in areas with currently low mortality (in association with bark beetles or from the fire itself), may shift acres, within the 34,000 acres, from a “no-plant” expectation into a need for planting.

## **Alternative A - (No Action)**

### **Introduction**

Alternative A is the No Action alternative. This alternative is required and serves as a baseline for comparison of the effects of all of the alternatives.

### **Key Issues**

This alternative responds to the following *key issues*:

*Changes in Motorized Access.* This alternative would not conduct any road decommissioning, closure or improvement work, so no changes in access would result. No progress toward or compliance with Forest Plan standards for maximum road density would occur.

*Effects on Soils, Watersheds, and Aquatic Habitat.* This alternative would not cause short-term impacts to soil and watersheds from commercial salvage or other fuel reduction activities. On the other hand, it does not contain soil and riparian protection and restoration projects.

*Effects on Wildlife Habitat.* This alternative includes no proposals that would alter currently existing habitats including snag and down wood dependent species habitat and mule deer cover.

*Recovery using a limited-intervention approach vs. Recovery using a full range of active management practices, including commercial salvage.* This alternative would not conduct any commercial salvage, fuel reduction or reforestation through planting. Attainment of sustainable LOS conditions would rely on passive recovery.

Under Alternative A there would be no change in current management direction or in the level of ongoing management activities, such as road maintenance or the noxious weed treatment program, within the project area. Work previously planned within the project area would still occur under all alternatives, including Alternative A (See Appendix A, Tables A-12, A-14, A-16 and A-17).

### **Actions**

#### **Commercial Salvage Harvest (General)**

No activity would occur.

#### **Specific Type:**

##### **Roadside Hazard Salvage**

###### **Outside of Riparian Habitat Conservation Areas**

No commercial activity would occur. Public safety would still be addressed.

###### **Within Riparian Habitat Conservation Areas**

No commercial activity would occur. Public safety would still be addressed.

##### **Commercial Salvage Harvest in Riparian Habitat Conservation Areas (Not in Roadside Hazard Corridors)**

No activity would occur.

#### **Snag Retention**

Other than those already felled for public safety or those to be fallen for safety in the near future, all snags would be retained in the short term.

#### **Precommercial Thinning**

No activity would occur.

### **Reforestation (Planting)**

The burned areas would be left to reforest naturally; no trees would be planted.

### **Fuels Treatments and Reductions**

No fuel reduction would occur; all fuels, both live and dead trees, would be left.

### **Prescribed Fire**

No activity would occur.

### **Road Management**

No activity would occur. All 271.0 miles of road on National Forest System lands within the project boundary would remain open. Open road density would remain at 3.68 miles per square mile.

### **Temporary Road Development**

No temporary roads would be built for timber harvest.

### **Road Reconstruction**

No road reconstruction would occur.

### **Soil and Riparian Protection and Restoration Projects:**

#### **Aspen Enhancement**

#### **Placement of Large Woody Debris**

#### **Deciduous Planting**

#### **Road 2917413 Drainage Improvement**

No activity would occur. Protection or enhancement would rely on a passive approach. No improvement to riparian habitat through specific project actions would occur.

## **Actions Common to All Fully Analyzed Action Alternatives**

### **Introduction**

This section will be used to describe each of the actions, or design elements of those actions, that are common between all fully developed action alternatives. Following a description of the actions, a table displays the connection that each action has to the project purpose and need. This relationship will be discussed further in the “effects” discussions in each appropriate resource section of Chapter 3 under “Environmental Consequences”.

Maps of the actions, by alternative, are included in the separate Map Packet.

No management activities are proposed in Inventoried Roadless Areas (IRAs) in any alternative. No prescribed fire or other potentially cover-reducing activities are proposed in mule deer winter range in any alternative.

### **Actions**

#### **Commercial Salvage (General)**

All fully developed action alternatives include some commercial salvage. Specific acreage is included in the individual alternative descriptions, along with alternative specific information on logging systems. *Within commercial salvage units, ponderosa pine, lodgepole pine or white fir trees with less than 20 percent bright green crown would be considered eligible for salvage harvest, with no diameter limits, if not reserved for retention for habitat or other resource reasons. In addition to the above criteria, in mixed conifer stands, white fir trees less than 21” diameter breast height (dbh) would be considered eligible for salvage harvest if bole char is visible for 30 percent or greater of the circumference of the bole or root collar. White fir trees have a much thinner bark than ponderosa pine and are highly susceptible to cambium death from heat damage. Random sampling of “green” white fir trees during the spring and early summer of 2003 has confirmed that “green” white fir trees, less than 21” dbh, that show even light char on a portion of the bole have dead cambium the entire circumference of the bole.*

Approximately 80 percent of this timber volume would be ponderosa pine, 10 percent would be white fir, and 10 percent would be lodgepole pine. Volume estimates are based on the best available information. For this analysis the main body of information is mortality mapping from September 2002 aerial photos and on-the-ground reconnaissance. Volume estimates

and harvest projections are based on 9" minimum dbh and the expectation of some additional mortality, from both the direct effects of fire and the effects of insects, beyond that apparent in the fall of 2002. Actual volume will be determined by applying the above "salvage eligibility" criteria to the areas designated for salvage harvest at the actual time of implementation

Trees smaller than 14 inches dbh may not be merchantable by the time timber sales are expected to proceed (sometime in 2004). As material deteriorates, the mix of volume, between sawtimber and fiber, would begin to trend in the direction of fiber. If there is an unfavorable fiber market, then some of the harvest units may not be offered due to market conditions. Other activities planned within such units may continue, including tree felling and fuels treatment to insure that planting could be prudently implemented.

Existing merchantable down wood within commercial salvage units may be removed to the extent that a minimum of 80 lineal feet per acre remains.

All roads that are used for timber haul would receive road maintenance in accordance with the timber sale contract, including dust abatement. All roads that are used for timber haul, or other contractor access, are subject to OSHA requirements. The criteria that would determine whether hazard abatement would be accomplished through "fall and leave" vs. "fall and remove" would be based on LRMP standards and guidelines for down wood. In all action alternatives, fall and remove trees could be "included timber" in a timber sale by approval under timber sale contract provisions. Fall and remove would be applied only to trees in areas that are in excess of Standards and Guidelines (80 lineal feet of downed wood per acre; or, as applied to this proposal, 800 lineal feet of downed wood per 10 acres of roadside area). For example, this could be a 10-acre area defined by ¼ mile (both sides of road) that extends 150 feet from the road edge. In order to contribute toward the 800 lineal feet of downed wood, pieces must be at least 12" small end diameter and non-case-hardened.

#### Logging Systems

As stated earlier, the typical slopes in the project area are very gentle, with about 70 percent being less than 15 percent sideslope and 90 percent to 95 percent at less than 30 percent sideslope. For reference, a 15 percent sideslope applies to ground that, for every 100 feet of horizontal distance, there would be 15 feet of vertical rise or fall. Ground-based systems are generally acceptable on slopes of less than 35 percent sideslope with external yarding distances of less than 1,000 feet, and where management requirements allow ground based equipment operations. Logging system planning was based on local field knowledge, aerial photo interpretation, review of contour maps, and GIS topographic analysis. Logging system boundaries would be further refined during project implementation. Ground-based systems include various machines such as crawler tractors, rubber tired skidders, and forwarders. Also in this group are mechanical feller-bunchers that fell and bunch trees for skidding by a separate machine. Ground based machines can be equipped with grapples or winches. Operators of equipment with winches can pull line 50 to 70 feet to minimize ground disturbance or to reach logs in equipment exclusion areas. One end suspension of logs can be achieved by machines equipped with integrated arches that lift the leading ends of the logs free of the ground. All operations would occur within a framework defined by Road Best Management Practices (BMPs), Timber Best Management Practices, and the Fremont National Forest Soil Productivity Guide (USDA Forest Service, 2000; updated 2002). See Appendix C for complete documentation of BMPs.

Helicopter logging is proposed on continuous slopes greater than 35 percent, where excessive road construction would be required to reach isolated areas, and where specific resource protection could not be achieved with ground based equipment with or without winch line pulling. In helicopter logging, logs are flown fully suspended from the stump to the landing. The potential for adverse effects to many resources, such as soil and water, are minimized. Since yarding distances are often longer than tractor and skyline systems, the need for new road construction is reduced. A possible negative consequence is that larger landings, typically one acre, are usually required for efficient log processing and helicopter servicing.

The economic feasibility of helicopter logging is primarily affected by two factors: a.) The ability to maximize the weight of each "turn" (load) of logs by having the log weight approach the load carrying capacity of the helicopter and b.) minimizing "cycle" (round trip) time. Proposed helicopter designs were developed in consultation with the Forest Service Pacific Northwest Region Logging Engineer following his examination of the project area in September 2002. A Boeing 107 Vertol class machine was recommended for the project. The following parameters for logging system planning were provided:

- The minimum volume necessary for a helicopter sale is approximately 1.0 MMBF.
- Units need to contain 6 to 8 mbf (thousand board feet) per acre that is available for removal.

- A turn of logs needs to be available in an area 100 to 150 feet in diameter.
- Average flight distance to log landings should be between ½ to 1 mile. The shorter the distance the better.
- Flight distance to service landings for refueling and inspections should be as short as possible (4 to 5 miles).
- No yarding over BPA/PPL power lines.

See Appendix B for a listing, by alternative, of harvest units by unit size (acres), commercial volume, location by fire portion, percentage of conifer mortality, fuel treatment, logging system, and RHCA status.

**Some Specific Types of Salvage Harvest (subsets of the above section):**

**Roadside Hazard Salvage**

During the alternative development process, as design elements were considered in response to specific issues, consideration of priorities and tradeoffs was an inevitable part of that process. Specifically, when Alternative D was being considered, an objective was to create an alternative that responded to all elements of purpose and need while creating a substantially different mix regarding the “limited-intervention approach” vs. “active management approach” issue. One of the priorities for commercial salvage that emerged from that consideration was to identify areas that presented either a public safety concern or the prospect of on-going road maintenance (related to trees falling down) for up to two decades. Through this consideration, the identification of roadside hazard corridors, a “subset” of “Commercial Salvage”, emerged as a design element.

**Roadside Hazard Salvage Outside of Riparian Habitat Conservation Areas**

All action alternatives would commercially salvage approximately 1,084 acres that are outside RHCAs and within 150 feet of a road with a Maintenance Level of 3, 4, or 5 (covered under the Highway Safety Act) or other roads with an aggregate (gravel) surface. An additional criterion that was used to select roadside hazard treatment areas is whether the road passes through an area that experienced 26 percent or greater mortality, as of September 2002 mortality mapping. Areas that contained sensitive species or other specific resource protection needs were not included in such units, though public safety at these locations would still be addressed on a case-by-case basis. The objectives of roadside hazard treatment include both public safety and reduction of ongoing maintenance needs.

In areas of lesser mortality (25 percent and less) that are adjacent to Road Maintenance Level 3, 4, 5 or aggregate surfaced roads hazard trees would be considered on a case-by-case basis. Hazard abatement in these areas could also be accomplished through the commercial timber sales covered by this analysis, using timber sale contract provision under the auspices of OSHA guidelines. This could entail including them as a part of a relatively large sale or accomplishing the hazard abatement through a series of small sales.

Clumps of dead trees would be retained in the roadside hazard treatment corridors to jointly meet visual and wildlife habitat objectives. In all cases, such clumps would only include trees that would not fall onto the road. Trees that are retained would be considered a part of attainment of snag and down wood dependent species habitat objectives. General visual objectives are to leave sufficient scattered clumps to break up the potentially objectionable “look” of long stretches of treeless landscape in the frontage zone along these roads. These clumps should be primarily in 85 percent to 100 percent mortality areas, and secondarily in 50-85 percent mortality areas. Areas with mortality below these levels would not require any special design to meet visual objectives, because of the presence of abundant green trees.

Roadside hazard salvage outside of RHCAs is the same (1,084 acres) in all action alternatives and will not be discussed individually by alternative.

**Roadside Hazard Salvage within Riparian Habitat Conservation Areas**

Areas within RHCAs were not specifically excluded from roadside hazard treatment. For all action alternatives, included in the total commercial salvage proposal, are approximately 216 acres of Roadside Hazard Salvage. This includes: 15 acres within Category 1 RHCAs, 186 acres within Category 3 RHCAs, and 15 acres within Category 4 RHCAs.

For those roadside hazard treatment areas within RHCAs, objectives, in addition to public safety and reduction of ongoing maintenance needs, include Riparian Management Objectives, as per the Inland Native Fish Strategy (INFISH). Within RHCAs, trees that pose a hazard would be included as commercial salvage only if they are in excess of INFISH objectives for large woody debris (20 pieces per mile greater than 12 inch diameter and greater than 35 feet long). Those trees requiring hazard abatement within RHCA roadside hazard treatment units that are needed to reach attainment of INFISH objectives would be felled and left.

Roadside hazard salvage within RHCAs is the same in all action alternatives (216 acres) and will not be discussed individually by alternative.

See “Mitigation and Resource Protection Measures”, later in this chapter, for additional specific measures that apply to roadside hazard treatment areas within RHCAs.

### **Commercial Salvage Harvest in Riparian Habitat Conservation Areas (Not in Roadside Hazard Corridors)**

Included in the total commercial salvage, for some action alternatives, are areas within RHCAs other than the roadside hazard corridors described immediately above. Though specific acreage varies between alternatives, design elements described below apply to all. See descriptions of individual alternatives and Appendix B for unit specific information on commercial salvage within RHCAs. All activities within RHCAs would comply with Fremont National Forest Land and Resource Management Plan (LRMP) Standards and Guidelines and objectives, as amended by the Inland Native Fish Strategy (INFISH). Specifically, the following would be applied to salvage activity within RHCAs, not in roadside hazard corridors:

Category 1 – Perennial Fish Bearing Streams: In the outer 100 feet of the RHCA (which are typically 300 feet wide, or wider, in slope distance beyond the edge of the active stream channel, on each side of the stream) salvage harvest of selected trees or clumps. Helicopter yarding would be used where topography warrants or where attainment of Riparian Management Objectives necessitates aerial yarding. “Line-pulling” from ground-based equipment could be used otherwise. A feathered forest edge would be retained. No salvage would occur other than in the outer 100 feet of RHCA. No mechanized ground-based equipment would be allowed within the entire width of the RHCA, as a part of the commercial salvage operation, except at existing classified road crossings.

There are no Category 2 RHCAs (perennial, non-fish bearing streams) in the project area.

Category 3 – Ponds, lakes, reservoirs, and wetlands greater than 1 acre: In the outer 75 feet of the RHCA (which are typically 150 feet wide slope distance beyond the edge of the wetland, pond, lake or reservoir) salvage harvest of selected trees or clumps would be allowed. Helicopter yarding would be used where topography warrants. “Line-pulling” from ground-based equipment would be used otherwise. A feathered forest edge would be retained. No mechanized ground-based equipment would be allowed within the entire width of the RHCA, except at existing classified road crossings. An exception to this would be considered in the event that isolated areas of harvest could be accessed by using an existing unclassified road as a temporary road or using a designated skid trail across an RHCA. Such exceptions would be coordinated with the Zone Hydrologist or Fisheries Biologist.

Category 4 – Seasonally flowing or intermittent streams and wetlands less than 1 acre: Site selective salvage harvest can occur within this RHCA (which are typically 50 feet wide in slope distance beyond the edge of the active stream channel, on each side of the stream). Between 20 and 80 trees per mile of stream, including all green trees and enough dead trees to provide long-term attainment of Riparian Management Objectives, would be retained. Retained trees would be at least 12 inches dbh and 35 feet tall. No mechanized ground-based equipment would be allowed within the entire width of RHCA, except at existing classified road crossings. An exception to this would be considered in the event that isolated areas of harvest could be accessed by using an existing unclassified road as a temporary road or using a designated skid trail across an RHCA. Such exceptions would be coordinated with the Zone Hydrologist or Fisheries Biologist.

### **Snag Retention**

Strictly speaking, this is not an “action”. It is not, for instance, snag-creation, which would be an action. Snag retention is a design element. However, varying responses and effects to the key issue of “*Effects on Wildlife Habitat - Habitat for snag and down wood dependent species*” were an acknowledged part of alternative development process since the beginning of the planning process. These considerations have remained central through the design and analysis of the alternatives. For

that reason, the snag retention strategies that are included in the alternatives are presented here under the “actions” heading. Recent science, represented by “*DecAid*” (or the “Decayed Wood Advisor for Managing Snags, Partially Dead Trees, and Down Wood for Biodiversity in Washington and Oregon” Mellen, 2002), was used to develop the retention designs and examine the effects on snag and down wood-dependent species.

Retention of snags for snag and down wood dependent species would be achieved through several strategies: 1.) Specifically selected no-salvage areas; 2.) Retention prescriptions within salvage units.

In addition, other areas of non-salvage, including those related to cultural resource protection, riparian protection, etc. contribute to habitat for snag and down wood dependent species. These latter are not quantified in this section, but instead will be discussed for their effect, by alternative, in Chapter 3.

No-salvage areas, outside of commercial salvage units have been selected following field inventory in fall 2002. The inventory identified approximately 2,689 acres that would provide optimal blocks of habitat for snag and down wood nesters, including consideration for species that generally favor large snags (Lewis’ woodpecker) and those that favor smaller snags (black-backed woodpecker). Specific acreage retained, within identified blocks of habitat, varies between alternatives and is discussed in the individual alternative descriptions.

Within commercial salvage units, for all alternatives, three different criteria would be used for snag retention (see below). These are based first on mortality level (areas of less than 50 percent mortality vs. areas of greater than 50 percent mortality) and then for areas less than 50 percent mortality, further divided by elevation and ecoclass. See Appendix B for information on snag retention, by unit (note: information in Appendix B is organized to display the dominant condition within each unit, based on September 2002 mortality mapping). The level of mortality within the project area is expected to increase through time in response to both the direct effects of fire or the effects of insects. Eventual implementation (“layout”) would be based on mortality at the time of layout. The percentage of each unit that falls into each of the three different criteria would determine the total number of snags required in a given unit.

In areas of less than 50 percent mortality:

**Table 2.1 Average Number of Snags Per Acre Within Harvest Units (Areas of Less than 50 percent Mortality)**

Snag Size	Average # snags/acre	
	1. < 5000’ elevation 2. 5000-5500’ elevation and Ecoclass CP-S2-11	1. > 5500’ elevation 2. 5000-5500’ elevation and <i>not</i> Ecoclass CP-S2-11
10-14.9”	0.9	2.0
15-19.9”	1.0	2.0
20-29.9”	0.8	1.7
>30”	0.2	0.4
<b>Total Snags/Acre</b>	<b>2.9</b>	<b>6.1</b>

\*CP-S2-11 is ponderosa pine - bitterbrush - fescue

In areas of greater than 50 percent mortality:

**Table 2.2 Average Number of Snags Per Acre Within Harvest Units (Areas of Greater than 50 percent Mortality)**

Snag Size	Average # snags/acre
10-14.9"	6.0
15-19.9"	2.0
20-29.9"	1.6
>30"	0.4
<b>Total Snags/Acre</b>	<b>10.0</b>

Snags clumps would be retained every 5 to 10 acres. Category of mortality would be based on the overstory mortality within a five to ten acre area. This would be used to determine the total number of snags that would be needed to comprise a clump. Within a 10-acre area, a minimum of one snag clump would be required, with the exception of narrow units or narrow portions of units (see below). It is recognized that snag diameter classes, as described in the tables above, may not be present in all snag clumps due to variation within a stand. For example, in a pure lodgepole pine stand, trees greater than 15 " dbh may not be available. To account for this, snag clumps would be representative of the area for which they are being retained, while retaining the largest available snags. If larger snags were not available within a snag clump, they would be made up for in other snag clumps, where possible. All snags counted as retention would be 10 inches dbh or greater. Snag clumps would not exceed 2 acres. If the needed snag numbers cannot be achieved within a 2-acre area, the numbers would be made up in another snag clump within the same harvest unit. In some cases, snag clumps may need to be retained on the edge of the unit, or in strips, preferably near an area that is devoid of snags (i.e. scabflats or green stands without snags).

To ensure implementation of fuels treatment and reforestation, work areas for contract workers must meet Oregon OSHA standards. Workers cannot work within 1-1/2 tree lengths of high hazard trees. Snags retained within the project area may be considered high hazard trees at some time during implementation. This can present logistical problems in particularly narrow portions of salvage units. Snag retention in salvage units or parts of salvage units that are less than 500 feet wide would apply a specific exception to the snag clumping strategy described above. In these narrow units, or parts of units, dead trees that are adjacent to, but outside of, the unit will "count" toward meeting snag retention within the unit or parts of the unit, if the adjacent stand is not proposed for salvage and if at least 50% of the larger than 10 inch dbh trees are dead. In this case, snags would not be retained within the narrow portion of the unit.

Pre-fire snags will be protected to the extent possible. Groups of snags would be focused in the area around pre-fire snags where the opportunity exists. Generally, snag groups should be located greater than 200' from a road. If snag groups are located within 200' of a road for visual quality, snags should be selectively marked to ensure they are not tall enough to fall on a road.

Snag Retention in Roadside Hazard Areas: In roadside hazard corridors that are within salvage units, clumps would be located far enough from the road that none of the trees would reach the road. Trees that are retained would be considered a part of attainment of snag and down wood dependent species habitat objectives. General visual objectives are to leave sufficient scattered clumps to break up the potentially objectionable "look" of long stretches of treeless landscape in the frontage zone along these roads. These clumps should be primarily in 85 percent to 100 percent mortality areas, and secondarily in 50-85 percent mortality areas. Areas with mortality below these levels would not require any special design to meet visual objectives.

Retention prescriptions within salvage units will not be discussed individually by alternative.

### **Precommercial Thinning**

The amount varies between alternatives, but the same design elements apply. This activity entails thinning within existing plantations in order to promote the long-term development of sustainable LOS forest conditions. Thinning and slash treatment would be with either chainsaws or low ground pressure mechanized equipment. Thinning prescriptions that would maintain big game hiding cover would be used. Specifically, the stand density objective would be approximately 130 trees per acre, including one small, unthinned cover patch per acre. Specific acreage is discussed in the individual alternative descriptions.

### **Reforestation (Planting)**

In all action alternatives, planting of tree seedlings would occur within approximately 34,000 acres that experienced loss of stocking due to fire. Due to a variance in current conditions, reforestation needs throughout the project area range from areas on which full reforestation on all acres would occur, such as in areas of heaviest mortality; to areas that were lightly burned and could become fully stocked by “spacing off” from existing green trees. To account for this variance, some areas would be fully planted (all acres planted at desired spacing) while some would be planted somewhat more lightly and some would only be “spot planted.” Factoring in this variation in current condition, it is estimated that 20,800 of the 34,000 acres mentioned above would actually be planted (see Maps 30 and 31). This includes:

- Areas that are proposed for salvage harvest (varies by alternative and will be reported in the individual alternative descriptions)
- “Other” areas that are not proposed for salvage in a given alternative, such as:
  - Previous overstory removal units
  - Previous partial cut units
  - Areas without a commercially viable salvage component
  - Existing plantations

Estimation of planted acres is based on current condition. A change in that condition, such as increased mortality associated with bark beetles or the fire itself, may shift the composition of the variation discussed above and therefore “move” more acres into a planting need. The Toolbox Fire Recovery Project Silviculture Specialist Report provides additional detail on the variations in planting needs discussed above.

Reforestation strategies include consideration for several factors, including legal requirements, availability of nursery stock, site preparation, fuels treatment operation scheduling and annual capabilities, planting contractor safety concerns, and size of area that needs reforestation. Seedlings would be typically planted at between 130 and 250 trees per acre. Densities higher than this would occur only on sites with thick, well-established competing vegetation. This condition would only be expected to occur in the final years of planting. The need for higher planting densities would be based on local, site-specific experience with seedling mortality rates. Most seedlings would be ponderosa pine. Planting densities are designed to result in approximately 100 trees per acre (in typical sites) surviving their juvenile period. This then forms the population from which a sustainable LOS forests would be developed.

Site preparation for reforestation outside of harvest units would consist of falling dead material and follow-up fuels treatment. The amount varies between alternatives. Specific acreage is discussed in the individual alternative descriptions. In addition, within harvest units where both fuels treatment and planting are proposed unmerchantable trees greater than 9 inches dbh would be felled, if determined to be a hazard to reforestation operations. Such material would not likely be marketable. However, for all alternatives, if market conditions change it is possible that some of this material would be made available for sale, if this could be accomplished in a timely manner that accommodates scheduled seedling planting.

Some harvest units are planned to receive fuels treatment in addition to whole tree yarding (see next section “Fuels Treatments and Reductions”). If this additional treatment were delayed due to funding or other factors, site preparation would focus on accomplishing the amount of treatment needed to insure safe conditions for planting. In this case, the remaining planned fuels treatment would occur only if compatible with reforestation.

Each action alternative description includes a table displaying an estimated scheduling scenario for reforestation, fuels treatment in areas to be planted, and site preparation between 2004 and 2009. It assumes a specific set of annual capabilities for site preparation, fuels treatment, and planting with consideration for allowing required safe working conditions in relation to hazards from falling trees. If scheduling scenarios change and unanticipated hazards associated with dead standing trees develop within harvest units, additional acres of site preparation may occur. If such additional site preparation were necessitated, it would not occur in these harvest units any earlier than necessary to meet the 5-year reforestation requirement.

In order to allow the full development of riparian vegetation, no conifer reforestation is proposed within harvest units within Category 1 RHCAs. In Category 3 and 4 RHCAs, in order to provide future shade and long term large woody debris recruitment, conifer planting would occur in those forested stands that experienced moderate and high vegetative mortality. In order to promote the development of deciduous riparian vegetation, no conifer planting would occur within 50 feet of any stream channel. Planting in Category 3 and 4 RHCAs would be at a density that would achieve sustainable LOS stand

conditions at 20 to 40 trees per acre. In other specifically identified areas where the fires produced mortality in areas that had been encroached over the past century by conifers, reforestation would not occur. These are typically “meadow-edge” areas that have been encroached by lodgepole pine.

### **Fuels Treatments and Reductions**

By using whole tree yarding and yarding with tops-attached-to-last-log, the commercial salvage operation itself would provide the initial step of fuels reduction. Specifically, use of whole-tree yarding is designed to initiate a reduction of activities-generated fuels. In all ground-based salvage units, trees 21 inches dbh or less would be whole tree yarded. Using this method, logs are skidded with tops and limbs attached. In all salvage units, except helicopter, for trees greater than 21 inches dbh, tops would be left attached to the last log and yarded to the landing (unless they break off). Limbs and tops piled at the landing would be disposed of later or utilized as chips or firewood. This determination would be made during post-sale monitoring. If utilization of piles were not feasible, landing piles (numbers vary by alternative) would be burned.

Whole tree yarding and leaving tops attached can be a final or intermediate fuel treatment. Within salvage units, fuels treatment in addition to whole tree yarding and leaving tops attached would occur in amounts that vary by alternative, but using methods common to all alternatives. See individual alternative descriptions and Appendix B for alternative and unit specific information. Such additional fuels treatments would occur following salvage activity, with the method to be determined through post-sale monitoring. Methods for all alternatives could include: underburning, broadcast burning, jackpot burning, machine (low ground pressure) pile and burning, grapple pile and burning, hand pile and burning, air curtain destructors, ladder fuel reduction (thinning - dead trees only), crushing (tomahawk / roller chopper), mastication (“slash buster”), or other methods.

Underburning involves igniting surface fuels under specified weather and fuel moisture conditions, so surface fuels are consumed but overstory trees are protected. Underburns are usually conducted in areas where the fuels are fairly continuous and where fire spread is predictable. Underburning implies that there is a live overstory present and often a live understory as well. Prescriptions for underburning usually define the acceptable mortality level in the live tree component, and efforts are made to minimize mortality to overstory trees. In areas of younger live plantations, underburning would be designed to protect young green trees. Jackpot burning consists of burning scattered accumulations of fuel within treatment units. Piling fuels following slashing, harvesting activities, or both, may be a final treatment when fuels discontinuity is the objective or an intermediate treatment prior to burning the piles. The amount of material to pile would vary by treatment unit based on the prescribed coarse woody debris requirement. Depending on fuel conditions, terrain or soil protection requirements, piling may be accomplished by hand or grapples. Air curtain destructors are self-contained, efficient, clean-burning fireboxes used primarily in areas with significant air quality concerns. The ladder fuel reduction or thinning portion of this fuels treatment includes the felling or other manipulation of dead material up to 9 inches in diameter. All the fuels treatments inside of harvest units are subject to reforestation scheduling needs.

As per INFISH Standard and Guideline FM-1, fuel treatment strategies in RHCAs would be designed “so as not to prevent attainment of Riparian Management Objectives” (RMOs). The RMO’s are specific, measurable habitat parameters that provide a basis for measuring the state of stream function and the attainability of the riparian goals described in INFISH. Fuels treatments in RHCAs would occur through a variety of mechanical means after reestablishment of adequate vegetation.

### **Prescribed Fire**

Some action alternatives include application of prescribed fire beyond that used for the activity fuels treatments discussed above. It would be primarily outside of harvest units, but there would be some minor overlap into units. Though specific acreage varies between alternatives, design elements described below apply to all. Specific acreage is included in the individual alternative descriptions.

Application of prescribed fire is a component of the overall fuels treatment/reduction strategy and a contributor to the development or maintenance of sustainable LOS conditions. Criteria for proposing prescribed fire also included selecting areas that experienced low mortality during the 2002 wildfires and areas that could effectively be “blocked up” in at least 100 acre parcels. Smaller areas were selected if containment features existed. In addition, selection of areas proposed for prescribed fire considered the need to generally avoid proposed salvage harvest areas to avoid interference with operations. The areas needed to focus on low mortality areas, due to the amount of needle cast and fine fuel recovery on the ground after the 2002 fires. Areas adjacent to private lands were favored. Areas with a high percentage of lodgepole pine were avoided. Application of prescribed fire in lodgepole pine areas is not considered a prudent tool in improving sustainability as it generally results in unacceptably high levels of mortality. Significant cultural resource sites were avoided. No

pretreatment (small diameter tree “slashing”) would be used in preparation for the application of prescribed fire in any of the action alternatives.

Since the application of prescribed fire has effects beyond fuels reduction (see “*Key Issue: Effects on Wildlife Habitat*”) prescribed fire project design must weigh additional factors. In that light, areas proposed for prescribed fire in all alternatives are outside of mule deer winter range. In order to maintain big game habitat, prescribed fire would be applied using a design that would provide habitat for shrub-steppe dependent species, cover, and travel corridors. The desired condition is to produce a mosaic of shrub habitat and cover while increasing forest sustainability. The objective would be to achieve a 40 percent-60 percent *burned* / 60 percent-40 percent *unburned* mosaic. Initially the area would be burned once to meet the desired condition, after which the area would be maintained with a prescribed fire frequency of 20-40 years.

### **Road Management**

In each alternative, varying by alternative, some classified roads (listed in Appendix E) would be either decommissioned or closed for the primary purpose of promoting watershed recovery or reducing their impact on wildlife habitat. Road decommissioning is defined as activity that results in the stabilization and restoration of unneeded roads to a more natural state. Such roads are then no longer usable by motorized vehicles. The road management proposals are based on recommendations that resulted from field inventories in the fall of 2002 and an evaluation of existing conditions by an interdisciplinary team represented in: soils, hydrology, fisheries, wildlife, cultural resources, silviculture, recreation, engineering, timber and fire. Priorities were placed on roads in closest proximity to RHCAs. The proposals to reduce open road density from current levels were also a response to LRMP direction that states: “Road density will be the most economical system necessary to meet the land management objectives. Overall density for roaded areas of the Forest will not exceed 2.5 miles per square mile” (LRMP, page 116).

### **Temporary Road Development**

The salvage harvest activities are expected to require the use of temporary roads. For each alternative, a specific temporary road plan was developed, based on unit-by-unit consideration by the timber planner on the Toolbox Fire Recovery Project Interdisciplinary Team. The quantities of temporary road, by alternative are disclosed in each alternative description. Temporary road planning represents the most likely configuration of the logging systems that would be used during timber sale operations (see Maps 34 and 35). It is recognized that actual temporary road locations are determined through agreement by the Forest Service during timber sale contract administration. This planning includes the re-opening of existing unclassified roads and new construction. Unclassified roads are defined in Forest Service Manual 7700 as, “Roads on National Forest System lands that are not managed as part of the forest transportation system, such as unplanned roads, abandoned travelways, and off-road vehicle tracks that have not been designated and managed as a trail; and those roads that were once under permit or other authorization and were not decommissioned upon the termination of the authorization (36 CFR 212.1).”

The Timber Sale Contract contains provision B 6.62 – Temporary Roads. The clause states, “As necessary to attain stabilization of roadbed and fill slopes of Temporary Roads, Purchaser shall employ such measures as outsloping, drainage dips and water-spreading ditches. After a Temporary Road has served Purchaser’s purpose, Purchaser shall give notice to Forest Service and shall remove bridges and culverts, eliminate ditches, outslope the roadbed, remove ruts and berms, effectively block the road to normal vehicular traffic where feasible under existing terrain conditions and build cross ditches and water bars as staked or otherwise marked on the ground by Forest Service. Where bridges and culverts are removed, associated fills shall also be removed to the extent necessary to permit normal maximum flow of water.”

### **Road Reconstruction**

This would consist of surfacing or re-surfacing the road with pit-run cinders. See individual alternative descriptions for maps and listings. Material would come from three cinder pits that are currently developed:

- Rim Cinder Pit: NW, SE, Sec.34, T.29S., R.16E
- Thompson Cinder Pit: NW, Sec.24, T.30S., R.13E.
- 3004 Cinder Pit: NE, NE, Sec.5, T.31S., R.16E.

### **Soil and Riparian Protection and Restoration Projects:**

The following projects are included in some of the alternatives. See individual alternative descriptions.

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**Aspen Enhancement** – Approximately 690 acres of aspen habitat have been identified for treatments designed to protect or enhance the aspen clone. Each stand would be further evaluated to determine the condition of the aspen and what kind of treatment is appropriate for that stand. Treatments would be designed to mitigate browsing by livestock and big game or the effects of encroachment of conifers and juniper.

Treatment may include the following:

- Thinning of snags or live trees to protect regeneration, release the aspen, and to discourage access of livestock or big game. If it is determined that snags need to be felled to meet the objectives, snags would be retained at or above the numbers required within harvest units.
- Fencing.

**Placement of Large Woody Debris** - This would consist of placement of large woody debris or other in-stream structures to meet Riparian Management Objectives in approximately 9.6 miles of perennial fish bearing stream.

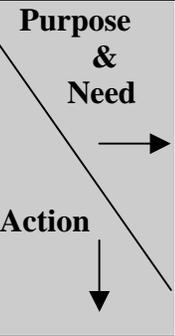
**Deciduous Planting** - This would consist of approximately 7 acres of riparian area deciduous plantings.

**Road 2917413 Drainage Improvement** - This short road provides access to Bunyard Crossing, a dispersed recreation site. It was identified during the roads analysis process as needing drainage improvement on one section. The road is adjacent to Silver Creek (a perennial, fish bearing stream). Currently the road does not provide adequate drainage, resulting in a section of the road becoming saturated with moisture. This results in sediment being introduced to Silver Creek. Drainage improvement would consist of installing a cross drain culvert for the purpose of eliminating the introduction of sediment into Silver Creek. This is particularly important following the high mortality that occurred at this site, during the period of vegetation recovery.

### **Actions – Purpose and Need**

The actions described above all respond to one or more elements of the Purpose and Need presented in Chapter 1. The following table identifies the relationship between purpose and need and the actions described above. For further discussion see appropriate resource sections of Chapter 3 “Environmental Consequences”.

**Table 2.3 – Relationship Between Actions and Purpose and Need**

<b>Purpose &amp; Need</b>  <b>Action</b>	Maintain snag and down wood habitat created or promote recovery of live forest habitat lost as a result of the fire	Reduce future surface fuel loading in order to influence subsequent fire behavior and effects	Restore riparian areas	Reduce insect infestation by removing breeding habitat for bark beetles	Develop a long-term sustainable forest that is maintainable by re-introduction of fire	Salvage timber for merchantable value
Commercial Salvage (General)  Roadside Hazard Salvage: Outside of RHCAs Within RHCAs  Commercial Salvage in RHCAs (Not in Roadside)		♦ (= Action Responds to Purpose and Need)		♦	♦	♦
Snag Retention	♦					
Precommercial Thinning					♦	
Reforestation (Planting)	♦		♦		♦	
Fuels Treatments and Reductions		♦	♦	♦	♦	
Prescribed Fire		♦			♦	
Road Management			♦			
Temporary Road Development						♦
Road Reconstruction			♦			♦
Aspen Enhancement	♦		♦		♦	
Placement of LWD	♦		♦			
Deciduous Planting	♦		♦		♦	
Road 2917413 Drainage Improvement			♦			

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## Action Alternative Descriptions

### Introduction

Other than the above common actions or design elements, each fully analyzed action alternative also has design elements or actions that differentiate it from the other alternatives. These are discussed in the following sections. Alternatives were developed based on varying responses to the key issues discussed above, with design features and mitigation requirements related to the issues and public concerns. The issues were raised as a result of concern with the original proposed action.

## Alternative C

Maps 5, 6, 7, 8, 9, 30, 31, 34 and 35 show the locations of actions included in Alternative C.

### Introduction

Alternative C, in following the same approach toward meeting the purpose and need as the original proposed action, places an emphasis on providing wood products while contributing to the long-term development of LOS. This alternative is a modified version of the proposed action that was presented to the public in November 2002 during scoping. It was the first action alternative to be fully developed. As described in Chapter 1, Alternative C includes adjustments made to the scale and location of proposed activities, primarily based on additional site-specific information derived from resource reconnaissance completed in the fall of 2002, following development of the original proposed action.

The original proposed action (see Alternative B later in this chapter) was based on preliminary information developed during August and September of 2002. It was developed with “best estimate” responses to Forest Plan standards and guidelines for some wildlife species, riparian protection, cultural resource protection, and other resources. The original proposed action includes 21,500 acres of commercial salvage, while Alternative C, due to the reasons cited above, includes an estimated 14,441 acres of commercial salvage. Additional minor adjustments were made in response to the desire to reduce the complexity of the analysis by eliminating those subwatersheds with relatively few acres burned by the Toolbox Complex. Prior to initial scoping, this approach had already led to the exclusion of the Bridge Creek subwatershed of the Silver Creek watershed from the project area. Alternative C (and all fully developed and analyzed alternatives) also dropped the small portion of the Ana River subwatershed (within the Summer Lake watershed) inside the fire boundary from any proposal for treatment.

### Key Issues

Scoping comments on the original Proposed Action generated the key issues used to develop the other action alternatives. One of these key issues played a role in the modification of the Proposed Action that led to Alternative C. Specifically, this alternative was developed by modifying the Proposed Action in response to the following *key issue*:

*Changes in Motorized Access.* The original proposed action displayed some proposed road decommissioning. However, it acknowledged that following an area-wide Roads Analysis, additional recommendations for decommissioning, closure or leaving roads open would be included in the fully developed alternatives. Alternative C includes a full set of road management actions. The original proposed action did not address the question of access within the portion of the project area that is in within former Klamath Indian Reservation boundaries. In response to public input, Alternative C, the modified proposed action, would retain existing motorized access within former Klamath Indian Reservation boundaries.

**Actions**

<b>Alternative C</b>	
<i>At a Glance.....</i>	
Commercial Salvage (Total Acres of Harvest)	14,441 acres
(subset of the above) Commercial Salvage in Riparian Habitat Conservation Areas, other than in Roadside Hazard Corridors (Acres of Harvest)	416 acres
Snag Retention (Percent of Identified Optimal Habitat Retained) – Of 2,689 acres of identified optimal habitat for black-backed and Lewis’ woodpecker	86%
Precommercial Thinning (Acres)	2,214 acres
Reforestation (Total Planting Acres / Site Prep Acres)	20,906 acres / 5,301 acres
Fuels Treatments and Reductions (Acres of Fuels Reduction):	
• In ground-based units, additional to yard-tops-attached or whole-tree-yard	10,244 acres
• Additional reductions within ¼ mile of Private Land, outside of units	none
• Prescribed Fire, outside of salvage units	3,572 acres
Road Management (Percent of Existing Road Miles):	
• Left Open	48%
• Decommissioned	25%
• Closed	27%
Temporary Road Development (Miles: Re-open Existing / New Construction)	21.4 miles / 16.0 miles
Road Reconstruction (Miles of Re-surfacing)	10.9 miles
Does Alternative Propose the Following Soil and Riparian Protection and Restoration Projects? (Yes or No):	
• Aspen Enhancement	Yes
• Placement of Large Woody Debris	Yes
• Deciduous Planting	Yes
• Road 2917413 Drainage Improvement	Yes

Some of the actions that require additional explanation, beyond that included in “Actions Common to All Fully Analyzed Action Alternatives” or the above display, are discussed immediately below. Comparisons of activity acres, mileages, and other categorizations are summarized in Table 2.14.

**Commercial Salvage (General)**

This includes salvage harvest of approximately 14,441 acres within a total of 312 harvest units. The Toolbox Fire portion would include 176 harvest units and 136 harvest units would be within the Silver Fire portion. Total harvest volume is estimated to be 73.3 mmbf (million board feet).

Of the 312 salvage units in Alternative C, 297 units, totaling 13,971 acres, with an estimated timber volume of 69.2 mmbf, are proposed as ground-based. Fifteen salvage units in Alternative C, totaling 470 acres, with an estimated timber volume of 4.1 mmbf, are proposed as helicopter units. Information on a unit-by-unit basis is provided in Appendix B.

**Some Specific Types of Salvage Harvest (subsets of the above section):**

**Roadside Hazard Salvage** - See “Actions Common to All Fully Analyzed Action Alternatives”

**Commercial Salvage Harvest in Riparian Habitat Conservation Areas (Not in Roadside Hazard Corridors)**

Other than roadside hazard corridors, Alternative C includes 416 acres proposed for commercial salvage in RHCAs. This acreage is included in the 14,441 total acres of salvage. This includes 22 acres in Category 1 RHCA, 262 acres in Category 2 and 132 acres in Category 4 (there are no category 2 RHCAs in the project area). See “Actions Common to All Fully Analyzed Action Alternatives” for a description of design elements that would be used to meet Inland Native Fish Strategy (INFISH) Riparian Management Objectives.

### Snag Retention

No-salvage areas have been selected following field inventory in fall 2002. The inventory identified approximately 2,689 acres that would provide optimal blocks of habitat for snag and down wood nesters, including consideration for species that generally favor large snags (Lewis' woodpecker) and those that favor smaller snags (black-backed woodpecker). For Alternative C, approximately 2,303 of these inventoried acres would be in "no-salvage" areas where all snags would be retained. For snag retention prescriptions within salvage units, see "Actions Common to All Fully Analyzed Action Alternatives".

### Reforestation

Factoring in the variation in current condition, it is estimated that 20,906 of the 34,000 acres discussed under "Actions Common to All Fully Analyzed Action Alternatives" would actually be planted. It is these "net" acres that are included in the table below. This includes approximately 10,687 acres of planting in proposed salvage units, 8,949 acres of planting in "other" areas (such as previous overstory removal units, previous partial cut units, or areas without a commercially viable salvage component) and 1,270 acres in existing plantations. Site preparation for reforestation outside of harvest would occur on approximately 5,301 acres.

The following table presents the most likely combination-of-activity scenarios and scheduling scenarios for reforestation, fuels treatment in areas to be planted, and site preparation that would occur under Alternative C.

**Table 2.4 - Alternative C Estimated Scheduling for Reforestation**

Year		Activity Combination							TOTAL For YEAR
		Salvage Harvest; with Fuels Treatment; Plant	Salvage Harvest no Fuels Treatment ; Plant	Other (i.e. Previous Harvest); no Site Prep; Plant	Other (i.e. Previous Harvest); with Site Prep; Plant	Plantation; no Site Prep; Plant	Plantation; with Site Prep; Plant	Estimated Re-plant*	
		Est. Acres	Est. Acres	Est. Acres	Est. Acres	Est. Acres	Est. Acres	Est. Acres	
2004	Site Prep				1000				1000
	Fuels Tr.								
	Plant								
2005	Site Prep				3301				3301
	Fuels Tr.	3000							3000
	Plant		2045	1458	1500				5003
2006	Site Prep								
	Fuels Tr.	3974							3974
	Plant	540		3190		332	938		5000
2007	Site Prep								
	Fuels Tr.	1668							1668
	Plant	5000							5000
2008	Site Prep							1000	1000
	Fuels Tr.								
	Plant	3102			2000				5102
2009	Site Prep								
	Fuels Tr.								
	Plant				801			4000	4801
Proposed Scheduling is subject to change as project progresses: (i.e. 2006 planting may need modification if unable to plant non-site-prepped areas due to safety concerns; if so, those acres would be site prepped starting in 2007 to retain habitat until that time, and then planted)									<b>GRAND TOTAL*</b>
<b>Total Site Prep</b>					<b>4301</b>			<b>1000</b>	<b>5301</b>
<b>Total Fuels Treat</b>		<b>8642</b>							<b>8642</b>
<b>Total Plant*</b>		<b>8642</b>	<b>2045</b>	<b>4648</b>	<b>4301</b>	<b>332</b>	<b>938</b>		<b>20906</b>

\* Grand Total of acres planted does not include re-planting. Re-planting would occur in areas where low seedling survival occurred.

**Fuels Treatments and Reductions**

Limbs and tops piled at the landing would be disposed of later or utilized as chips or firewood. This determination would be made during post-sale monitoring. If utilization of piles were not feasible, approximately 1,300 landing piles would be burned.

Within salvage units, fuels treatment in addition to whole tree yarding and leaving tops attached would occur on approximately 10,244 acres. This would include reduction of fuels created by the fire and by salvage activity. These treatments are planned for salvage units in which the majority of the acres would be expected to exceed 20 tons of fuel per acre within 15 years if no action is taken. See Appendix B for unit specific information.

**Road Management**

The original proposed action displayed some proposed road decommissioning. However, it acknowledged that following an area-wide Roads Analysis, additional recommendations for decommissioning, closure, or leaving roads open would be included in the fully developed alternatives. Alternative C includes a full set of road management actions. The original proposed action did not address the question of motorized access within the portion of the project area that is in within former Klamath Indian Reservation boundaries. In response to public input, Alternative C, the modified proposed action, would retain existing motorized access within former Klamath Indian Reservation boundaries.

Several roads (identified on Maps 7 and 8 and listed in Appendix E) would be either decommissioned or closed, for the purpose of promoting watershed recovery or reducing their impact on wildlife habitat. For Alternative C, approximately 72.9 miles of road would be closed (blocked), approximately 69.0 miles of road would be decommissioned, and approximately 129.1 miles of road would be left open. As a result of these actions, open road density in the project area as a whole (on National Forest System lands) would drop to 1.76 miles per square mile.

**Temporary Road Development**

The salvage harvest activities in Alternative C are expected to require the use of approximately 37.4 miles of temporary road. About 21.4 miles, of the 37.4-mile total would simply involve the re-opening of existing unclassified roads. Approximately 16.0 miles of temporary road would require new construction. The re-opening would be on 50 short, separate roads, ranging in length between 0.02 miles and 1.06 miles. The new construction would be on 59 short, separate roads, ranging in length between 0.06 miles and 0.72 miles.

**Road Reconstruction**

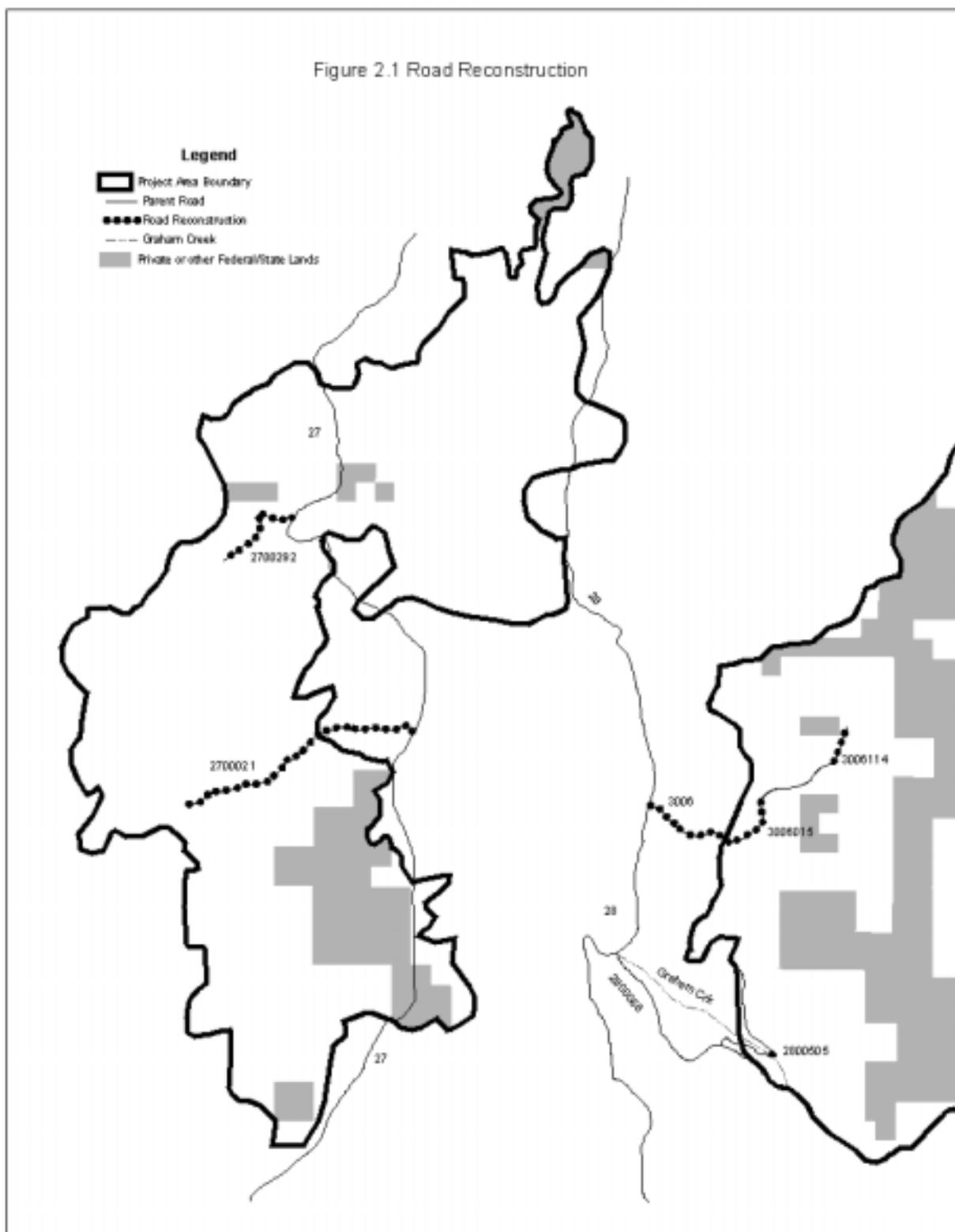
The following reconstruction, totaling 10.9 miles, would occur with this alternative:

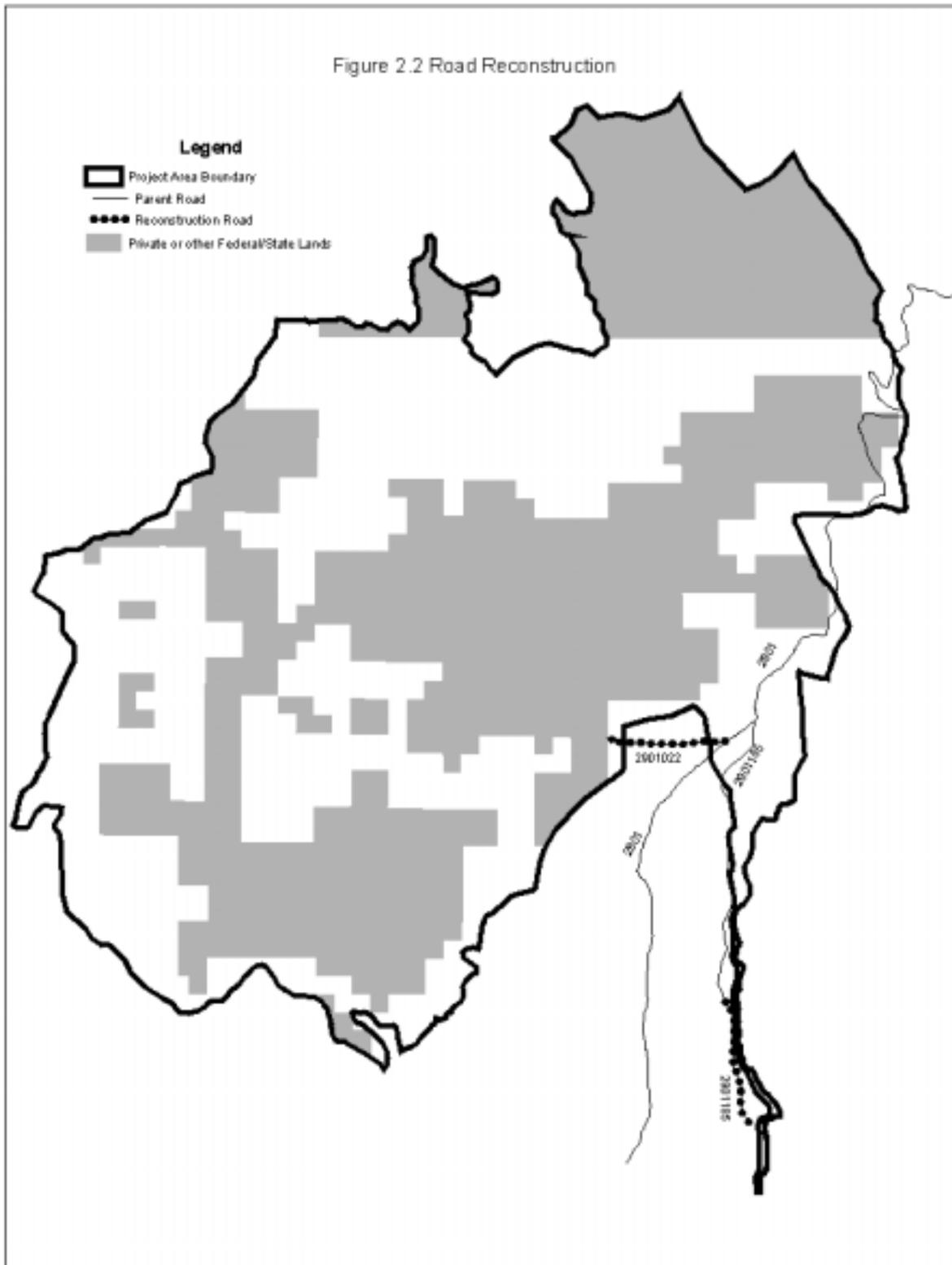
**Table 2.5 Alternative C Road Reconstruction**

ROAD NUMBER	RECONSTRUCTION TERMINI	MILES OF RECONSTRUCTION	SURFACING TYPE REQUIRED
2901022	2901 to 2901219	1.6	Pit Run Cinders-S
2901185	2901188 to 2901034	1.8	Pit Run Cinders-S
2700 021	2700 to 3038	3.6	Pit Run Cinders-R
2700292	2700 to 2700591	1.2	Pit Run Cinders-S
2800505	Milepost 0.7, Graham Cr.	0.1	Culvert Backfill
3006114	3006112 to 3006120	0.4	Pit Run Cinders-S
3006	2800 to 3006015	1.4	Pit Run Cinders-R
3006015	3006 to Milepost 0.8	0.8	Pit Run Cinders-R

R = Resurfacing S= Surfacing

The road 2800-505 reconstruction would involve repair work on the roadway at the culvert crossing on Graham Creek, which has washed out part of the roadway surface. The maps on the following two pages (Figures 2.1 and 2.2) display locations of the road reconstruction. Use the Vicinity Map (Map 1 in the Map Envelope) to provide additional context for Figures 2.1 and 2.2. The road reconstruction location is the same for all action alternatives except Alternative D, which includes only a portion of the roads included in the other alternatives (see Table 2.7 for Alternative D road reconstruction listing).





### Forest Plan Amendment

Following the July 2002 fires, mule deer cover and habitat effectiveness in the project area is currently below Forest Plan standards and guidelines (see Chapter 3, Wildlife – Management Indicator Species – Mule Deer for details). Proposed prescribed burning in this alternative is expected to result in reduction of cover for mule deer in transition and summer ranges, in some areas (some subwatersheds). Alternatives C (and G) include proposals for 1,122 acres of prescribed burning that are additional to the 2,450 acres that are proposed in Alternatives D and H. The purpose of the prescribed burning is to promote the long-term development and maintenance of LOS forest conditions in some areas where the July 2002 fires did not result in stand replacement fire. In order to achieve a greater level of benefit related to that purpose, than would Alternatives D, E or H, this alternative would require a Forest Plan amendment. See Chapter 3 effects analysis for information on the expected effects of the proposed prescribed burning.

Since mule deer cover and habitat effectiveness is currently below standards and guidelines, and the prescribed burning would further lower mule deer cover, this alternative would require a site-specific amendment to the Forest Plan (1989). Specifically, Forest Plan Standards for **mule deer cover** would be amended to the levels identified in this alternative, within the project area, for:

- Summer range in the East Duncan, Lower Duncan and Upper Duncan Creek subwatersheds
- Transition range in the East Duncan Creek subwatershed

Forest Plan Standards for mule deer habitat effectiveness would be amended, within this project area, for:

- Summer range in the Lower Duncan Creek subwatershed

Specifically, the Forest Plan Standards would be amended to allow the following reductions in cover or habitat effectiveness:

- Summer range **Cover** in the East Duncan: Reduction of cover on 231 acres that would reduce cover from 11.0% to 9.4%
- Summer range **Cover** in Lower Duncan: Reduction of cover on 96 acres that would reduce cover from 5.4% to 4.4%
- Summer range **Cover** in Upper Duncan Creek: Reduction of cover on 100 acres that would reduce cover from 19.8% to 19.6%
- Transition range **Cover** in the East Duncan: Reduction of cover on 33 acres that would reduce cover from 5.9% to 5.6%
- Summer Range **Habitat Effectiveness** in Lower Duncan: Reduction from 1.8% to 1.7%

### Mitigation and Resource Protection Measures

Mitigation and Resource Protection Measures that apply to Alternative C are described later in this chapter.

## Alternative D

Maps 10, 11, 12, 13, 14, 30, 31, 34 and 35 show the locations of actions included in Alternative D.

### Introduction

Alternative D approaches recovery through a substantially different mix of the “limited-intervention approach” vs. “active management approach”, than the other action alternatives. It includes the greatest amount of road decommissioning or closure of any of the action alternatives. It retains some commercial salvage, focused in roadside hazard treatment areas and areas where fuel loading is predicted to be very high within 15 years, if no action is taken. While addressing that element of purpose and need (salvage timber for merchantable value), it contains substantially lesser amounts of activity that could potentially contribute to short-term degradation of water quality or adverse cumulative watershed effects (logging, temporary road construction, fuels treatment, prescribed fire), than the other action alternatives.

### Key Issues

This alternative was developed in response to the following *key issues*:

*Effects on Soils, Watersheds, and Aquatic Habitat.* This alternative includes the largest amount of road decommissioning and closure of any alternative. As with all action alternatives, these actions are based primarily on

watershed recovery needs, and directly follow the set of recommendations that resulted from the Roads Analysis process. In order to reduce the potential for adverse effects to RHCAs, no units (other than roadside hazard treatment) are proposed for commercial salvage that are within any portion of any category of Riparian Habitat Conservation Area. In order to reduce the overall level of upland disturbance and, therefore, decrease the potential for cumulative watershed effects, commercial salvage is proposed in less than half the amount of acres as in Alternative C. This alternative eliminates any unit that would require any road construction (including new temporary road). Criteria for selecting areas that would be commercially salvaged included: units that are part of the roadside hazard reduction strategy and units that are in areas where fuel loading is predicted to be in excess of 20 tons per acre, based on percent mortality.

*Recovery Using a Limited-Intervention Approach vs. Recovery Using a Full Range of Active Management Practices, Including Commercial Salvage.* Alternative D proposes substantially fewer active management practices than does Alternative C. Among the action alternatives, Alternative D has the least area of active management as a means of recovery, therefore the greatest area where a limited-intervention approach would be taken. All action alternatives include at least partial attainment of all elements of purpose and need, including “salvage timber for merchantable value”. In that light, Alternative D includes some commercial salvage. No action alternative was fully developed and analyzed without some commercial salvage (see “Alternatives and Design Elements Considered But Not Fully Analyzed” later in this Chapter). About 87 percent of the National Forest System lands within the project boundary would not include commercial activity with Alternative D.

Other major differences between Alternative D and Alternative C include a reduction in the amount of proposed prescribed fire.

**Actions**

<b><u>Alternative D</u></b>	
<i>At a Glance.....</i>	
Commercial Salvage (Total Acres of Harvest)	6,367 acres
(subset of the above) Commercial Salvage in Riparian Habitat Conservation Areas, other than in Roadside Hazard Corridors (Acres of Harvest)	0 acres
Snag Retention (Percent of Identified Optimal Habitat Retained) – Of 2,689 acres of identified optimal habitat for black-backed and Lewis’ woodpecker	92%
Precommercial Thinning (Acres)	2,214 acres
Reforestation (Total Planting Acres / Site Prep Acres)	20,743 acres / 4,830 acres
Fuels Treatments and Reductions (Acres of Fuels Reduction):	
• In ground-based units, additional to yard-tops-attached or whole-tree-yard	5,680 acres
• Additional reductions within ¼ mile of Private Land, outside of units	none
• Prescribed Fire, outside of salvage units	2,450 acres
Road Management (Percent of Existing Road Miles):	
• Left Open	46%
• Decommissioned	26%
• Closed	28%
Temporary Road Development (Miles: Re-open Existing / New Construction)	5.7 miles / 0.0 miles
Road Reconstruction (Miles of Re-surfacing)	6.1 miles
Does Alternative Propose the Following Soil and Riparian Protection and Restoration Projects? (Yes or No):	
• Aspen Enhancement	Yes
• Placement of Large Woody Debris	Yes
• Deciduous Planting	Yes
• Road 2917413 Drainage Improvement	Yes

**Commercial Salvage (General)**

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This includes salvage harvest of approximately 6,367 acres within a total of 197 harvest units. The Toolbox fire portion includes 109 proposed harvest units and 88 harvest units are proposed within the Silver Fire portion. Total harvest volume is estimated to be 33.7 mmbf (million board feet).

Of the 197 salvage units in Alternative D, 189 units, totaling 6,007 acres, with an estimated timber volume of 30.5 mmbf, are proposed as ground-based. Eight salvage units in Alternative D, totaling 360 acres, with an estimated timber volume of 3.2 mmbf are proposed as helicopter units". Information on a unit-by-unit basis is provided in Appendix B.

**Some Specific Types of Salvage Harvest (subsets of the above section):**

**Roadside Hazard Salvage** - See "Actions Common to All Fully Analyzed Action Alternatives"

**Commercial Salvage Harvest in Riparian Habitat Conservation Areas (Not in Roadside Hazard Corridors)**

None.

**Snag Retention**

No-salvage areas have been selected following field inventory in fall 2002. The inventory identified approximately 2,689 acres that would provide optimal blocks of habitat for snag and down wood nesters, including consideration for species that generally favor large snags (Lewis' woodpecker) and that favor smaller snags (black-backed woodpecker). For Alternative D, approximately 2,482 of these inventoried acres would be in "no-salvage" areas where all snags would be retained. For snag retention prescriptions within salvage units, see "Actions Common to All Fully Analyzed Action Alternatives".

**Reforestation**

Factoring in the variation in current condition, it is estimated that 20,743 of the 34,000 acres discussed under "Actions Common to All Fully Analyzed Action Alternatives" would actually be planted. It is these "net" acres that are included in the table below. This includes approximately 5,139 acres of planting in proposed salvage units, 14,334 acres of planting in "other" areas (such as previous overstory removal units, previous partial cut units or areas without a commercially viable salvage component) and 1,270 acres in existing plantations. Site preparation for reforestation outside of harvest would occur on approximately 4,830 acres.

The following table presents the most likely combination-of-activity scenarios and scheduling scenarios for reforestation, fuels treatment in areas to be planted, and site preparation that would occur under Alternative D.

**Table 2.6 - Alternative D Estimated Scheduling for Reforestation**

Year		Activity Combination							TOTAL For YEAR
		Salvage Harvest; with Fuels Treatment/ Plant	Salvage Harvest; no Fuels Treatment/ Plant	Other (i.e. Previous Harvest)/ no Site Prep/Plant	Other (i.e. Previous Harvest)/ with Site Prep/ Plant	Plantation/ no Site Prep; Plant	Plantation/ with Site Prep; Plant	Estimated Re-*	
		Est. Acres	Est. Acres	Est. Acres	Est. Acres	Est. Acres	Est. Acres	Est. Acres	
2004	Site Prep				1000				1000
	Fuels Tr.								
	Plant								
2005	Site Prep				2000				2000
	Fuels Tr.	2776							2776
	Plant		363	5000					5363
2006	Site Prep				1330				13300
	Fuels Tr.	2000							2000
	Plant	1000		5004					6004
2007	Site Prep								
	Fuels Tr.								
	Plant	3776				332	938		5046
2008	Site Prep							500	500
	Fuels Tr.								
	Plant				4330				4330
2009	Site Prep								
	Fuels Tr.								
	Plant							4000	4000
Proposed Scheduling is subject to change as project progresses: (i.e. 2006 planting may need modification if unable to plant non-site-prepped areas due to safety concerns; if so, those acres would be site prepped starting in 2007 to retain habitat until that time, and then planted)									<b>GRAND TOTAL*</b>
<b>Total Site Prep</b>					<b>4330</b>			<b>500</b>	<b>4830</b>
<b>Total Fuels Treat</b>		<b>4776</b>							<b>4776</b>
<b>Total Plant*</b>		<b>4776</b>	<b>363</b>	<b>10004</b>	<b>4330</b>	<b>332</b>	<b>938</b>		<b>20743</b>

\* Grand Total of acres planted does not include re-planting. Re-planting would occur in areas where low seedling survival occurred.

**Fuels Treatments and Reductions**

Alternative D follows the same principles as Alternative C, but due to less harvest, there would be less fuel treatment. Limbs and tops piled at the landing would be disposed of later or utilized as chips or firewood. This determination would be made during post-sale monitoring. If utilization of piles were not feasible, approximately 500 landing piles would be burned.

Within salvage units, fuels treatment in addition to whole tree yarding and leaving tops attached would occur on approximately 5,680 acres. This would include reduction of fuels created by the fire and by salvage activity. These treatments are planned for salvage units in which the majority of the acres would be expected to exceed 20 tons of fuel per acre within 15 years if no action is taken. See Appendix B for unit specific information.

**Road Management**

Several roads (identified on Maps 12 and 13 and listed in Appendix E) would be either decommissioned or closed, for the purpose of promoting watershed recovery or reducing their impact on wildlife habitat. For Alternative D, approximately 75.5 miles of road would be closed (blocked), approximately 71.6 miles of road would be decommissioned, and approximately 123.9 miles of road would be left open. Road decommissioning is defined as activity that results in the stabilization and restoration of unneeded roads to a more natural state. As a result of these actions, open road density in the project area as a whole (on National Forest System lands) would drop to 1.68 miles per square mile.

Criteria used in developing road management proposals for Alternative D did not include retention of motorized access within former Klamath Indian Reservation boundaries, so road management proposal within that area are simply in response to watershed, wildlife habitat, or cultural resource protection objectives.

### Temporary Road Development

No new temporary roads would be developed with Alternative D. The salvage harvest activities in Alternative D are expected to require the use of approximately 5.7 miles of temporary road. This estimate is based on unit-by-unit consideration by the timber planner on the Toolbox Fire Recovery Project Interdisciplinary Team. All 5.7 miles would simply involve the re-opening of existing unclassified roads.

### Road Reconstruction

The following reconstruction, totaling 6.1 miles, would occur with this alternative:

**Table 2.7 Alternative D Road Reconstruction**

ROAD NUMBER	RECONSTRUCTION TERMINI	MILES OF RECONSTRUCTION	SURFACING TYPE REQUIRED
2700 -021	2700 to 3038	3.6	Pit Run Cinders-R
2700-292	2700 to Milepost 1.0	1.0	Pit Run Cinders-S
2800-505	Milepost 0.7, Graham Cr.	0.1	Culvert Backfill
3006	2800 to 3006-015	1.4	Pit Run Cinders-R

The roads listed above are all shown in Figure 2.1.

R = Resurfacing S= Surfacing

The road 2800-505 reconstructions would involve repair work on the roadway at the culvert crossing on Graham Creek, which has washed out part of the roadway surface.

### Soil and Riparian Protection and Restoration Projects

The soil and riparian protection and restoration projects proposed in this alternative would be the same as in Alternative C. Other than road management activities, as described above, the following types of soil and riparian protection and restoration projects would be implemented: aspen protection and enhancement, placement of large woody debris in perennial stream, deciduous planting in riparian areas, and drainage improvement on the access road to “Bunyard Crossing.” See “Actions Common to All Fully Analyzed Action Alternatives”

### Forest Plan Amendment

No Forest Plan amendment would be required to implement Alternative D.

### Mitigation and Resource Protection Measures

Mitigation and Resource Protection Measures that apply to Alternative D are described later in this chapter.

## Alternative E

Maps 15, 16, 17, 18, 30, 31, 34 and 35 show the locations of actions included in Alternative E.

### Introduction

Alternative E places an emphasis on economic efficiency in regard to commercial salvage.

### Key Issues

This alternative was developed in response to the following *key issues*:

*Economic Efficiency and Economic Opportunities.* Commercial salvage units were selected on a unit-by-unit basis for their predicted ability to provide a positive return when estimated logging costs were compared with projected timber value. This resulted in those units that had more estimated volume per acre being favored. As a result, though the acres of salvage are well below (for example) Alternative H, the estimated timber volume exceeds that alternative. Fuels treatment within salvage units, in addition to whole tree yarding, would occur only in salvage units in which the majority of the acres would be expected to exceed 30 tons of fuel per acre (other alternatives used 20 tons) within 15 years if no action is taken. No fuels treatment through prescribed fire in addition to activity fuels treatment is proposed in Alternative E.

*Changes in Motorized Access.* In response to public concern about the appropriateness of reducing motorized access and doubts raised about the efficiency of road decommissioning as a means of promoting watershed recovery, Alternative E offers road management proposals that differ from Alternative C. Specifically, Alternative E would implement road closure or decommissioning simply to the point of meeting maximum open road densities within LRMP standards and guidelines (for the project area as a whole). Retention of motorized access within former Klamath Indian Reservation lands was a consideration in developing road management proposals. Specifically, only those roads that were recommended for decommissioning by the roads analysis process would be decommissioned. Other roads within former the Klamath Indian Reservation boundary, which have less pressing need for treatment and were recommended for simple closure by the roads analysis process, would be left open.

**Actions**

<b><u>Alternative E</u></b>	
<i>At a Glance.....</i>	
Commercial Salvage (Total Acres of Harvest)	11,490 acres
(subset of the above)	
Commercial Salvage in Riparian Habitat Conservation Areas, other than in Roadside Hazard Corridors (Acres of Harvest)	316 acres
Snag Retention (Percent of Identified Optimal Habitat Retained) – Of 2,689 acres of identified optimal habitat for black-backed and Lewis’ woodpecker	87%
Precommercial Thinning (Acres)	none
Reforestation (Total Planting Acres / Site Prep Acres)	20,753 acres / 5,330 acres
Fuels Treatments and Reductions (Acres of Fuels Reduction):	
• In ground-based units, additional to yard-tops-attached or whole-tree-yard	6,723 acres
• Additional reductions within ¼ mile of Private Land, outside of units	none
• Prescribed Fire, outside of salvage units	none
Road Management (Percent of Existing Road Miles):	
• Left Open	70%
• Decommissioned	5%
• Closed	25%
Temporary Road Development (Miles: Re-open Existing / New Construction)	15.8 miles / 13.3 miles
Road Reconstruction (Miles of Re-surfacing)	10.9 miles
Does Alternative Propose the Following Soil and Riparian Protection and Restoration Projects? (Yes or No):	
• Aspen Enhancement	No
• Placement of Large Woody Debris	Yes
• Deciduous Planting	No
• Road 2917413 Drainage Improvement	No

Some of the actions that require additional explanation, beyond that included in “Actions Common to All Fully Analyzed Action Alternatives” or the above display, are discussed immediately below. Comparisons of activity acres, mileages, and other categorizations are summarized in Table 2.14.

**Commercial Salvage (General)**

This includes salvage harvest of approximately 11,490 acres within a total of 236 harvest units. The Toolbox Fire portion includes 131 proposed harvest units and 105 harvest units are proposed within the Silver Fire portion. Total harvest volume is estimated to be 66.1 mmbf (million board feet).

Of the 236 salvage units in Alternative E, 233 units, totaling 11,183 acres, with an estimated timber volume of 63.4 mmbf, are proposed as ground-based. Three salvage units in Alternative E, totaling 307 acres, with an estimated timber volume of 2.7 mmbf are proposed as helicopter units. Information on a unit-by-unit basis is provided in Appendix B.

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**Some Specific Types of Salvage Harvest (subsets of the above section):**

**Roadside Hazard Salvage** – See “Actions Common to All Fully Analyzed Action Alternatives”

**Commercial Salvage in Riparian Habitat Conservation Areas (Not in Roadside Hazard Corridors)**

Other than the roadside hazard corridors, Alternative E includes approximately 316 acres proposed for commercial salvage in RHCAs. This acreage is included in the 11,490 total acres of salvage. This includes 4 acres in Category 1 RHCA, 204 acres in Category 2 and 108 acres in Category 4 (there are no category 2 RHCAs in the project area). See “Actions Common to All Fully Analyzed Action Alternatives” for a description of design elements that would be used to meet Inland Native Fish Strategy (INFISH) Riparian Management Objectives.

**Snag Retention**

No-salvage areas have been selected following field inventory in fall 2002. The inventory identified approximately 2,689 acres that would provide optimal blocks of habitat for snag and down wood nesters, including consideration for species that generally favor large snags (Lewis’ woodpecker) and those that favor smaller snags (black-backed woodpecker). For Alternative E, approximately 2,348 of these inventoried acres would be in “no-salvage” areas where all snags would be retained. For snag retention prescriptions within salvage units, see “Actions Common to All Fully Analyzed Action Alternatives.”

**Reforestation**

Factoring in the variation in current condition, it is estimated that 20,753 of the 34,000 acres discussed under “Actions Common to All Fully Analyzed Action Alternatives” would actually be planted. It is these “net” acres that are included in the table below. This includes approximately 8,801 acres of planting in proposed salvage units, 10,674 acres of planting in “other” areas (such as previous overstory removal units, previous partial cut units, or areas without a commercially viable salvage component) and 1,278 acres in existing plantations. Site preparation for reforestation outside of harvest would occur on approximately 5,330 acres.

The following table presents the most likely combination-of-activity scenarios and scheduling scenarios for reforestation, fuels treatment in areas to be planted, and site preparation that would occur under Alternative E.

**Table 2.8 - Alternative E Estimated Scheduling for Reforestation**

Year		Activity Combination							TOTAL For YEAR
		Salvage Harvest; with Fuels Treatment; Plant	Salvage Harvest; no Fuels Treatment; Plant	Other (i.e. Previous Harvest); no Site Prep; Plant	Other (i.e. Previous Harvest); with Site Prep; Plant	Plantation; no Site Prep; Plant	Plantation; with Site Prep; Plant	Estimated Re-plant*	
		Est. Acres	Est. Acres	Est. Acres	Est. Acres	Est. Acres	Est. Acres	Est. Acres	
2004	Site Prep				1000				1000
	Fuels Tr.								
	Plant								
2005	Site Prep				1530				1530
	Fuels Tr.	3000							3000
	Plant		2500	2500					5000
2006	Site Prep				1800				1800
	Fuels Tr.	2759							2759
	Plant	500	542	3844		335			5221
2007	Site Prep								
	Fuels Tr.								
	Plant	5000							5000
2008	Site Prep							1000	1000
	Fuels Tr.								
	Plant	259			4030		943		5232
2009	Site Prep								
	Fuels Tr.								
	Plant				300			4000	4300
Proposed Scheduling is subject to change as project progresses: (i.e. 2006 planting may need modification if unable to plant non-site-prepped areas due to safety concerns; if so, those acres would be site prepped starting in 2007 to retain habitat until that time, and then planted)								<b>GRAND TOTAL*</b>	
<b>Total Site Prep</b>					<b>4330</b>			<b>1000</b>	<b>5330</b>
<b>Total Fuels Treat</b>		<b>5759</b>							<b>5759</b>
<b>Total Plant*</b>		<b>5759</b>	<b>3042</b>	<b>6344</b>	<b>4330</b>	<b>335</b>	<b>943</b>		<b>20753</b>

\* Grand Total of acres planted does not include re-planting. Re-planting would occur in areas where low seedling survival occurred.

### Fuels Treatments and Reductions

Limbs and tops piled at the landing would be disposed of later or utilized as chips or firewood. This determination would be made during post-sale monitoring. If utilization of piles were not feasible, approximately 1,000 landing piles would be burned.

Alternative E follows a somewhat different principle than Alternative C and the other action alternatives. Within salvage units, fuels treatment in addition to whole tree yarding and leaving tops attached would occur on approximately 6,723 acres. This would include reduction of fuel created by the fire and by salvage activity. These treatments are planned for salvage units in which the majority of the acres would be expected to exceed 30 tons of fuel per acre within 15 years if no action is taken (Alternative C and the other action alternatives used predicted levels of 20 tons per acre as a “threshold” criterion).

### Road Management

Alternative E is partially responsive to the *Changes in Motorized Access* issue. In response to concern about motorized access to public lands, open road density in the project area as a whole (on National Forest System lands) would be reduced only down to the level contained in the LRMP standards and guidelines. Within the former Klamath Indian Reservation lands, only those roads that were recommended for decommissioning by the roads analysis process are scheduled for decommissioning. Other roads within the former Klamath Indian Reservation boundary, that have less pressing need for treatment and were recommended for simple closure by the roads analysis process, would be left open. Several roads

(identified on Maps 17 and 18 and listed in Appendix E) would be either decommissioned or closed, for the purpose of promoting watershed recovery or reducing their impact on wildlife habitat. For Alternative E, approximately 67.4 miles of road would be closed (blocked), approximately 14.6 miles of road would be decommissioned, and approximately 188.9 miles of road would be left open. As a result of these actions, open road density in the project area as a whole (on National Forest System lands) would drop to 2.57 miles per square mile.

### Temporary Road Development

The salvage harvest activities in Alternative E are expected to require the use of approximately 29.1 miles of temporary road. About 15.8 miles of the 29.1 mile total would simply involve the re-opening of existing unclassified roads and approximately 13.3 miles of temporary road would require new construction. The re-opening would be on approximately 38 short, separate roads, ranging in length between 0.02 miles and 1.06 miles. The new construction would be on approximately 53 short, separate roads, ranging in length between 0.06 miles and 0.72 miles.

### Road Reconstruction

Road reconstruction for this alternative would be the same as Alternative C.

### Soil and Riparian Protection and Restoration Projects

Other than road management activities, as described above, the following types of soil and riparian protection and restoration projects would be implemented: placement of large woody debris in perennial stream.

### Forest Plan Amendment

No Forest Plan amendment would be required to implement Alternative E.

### Mitigation and Resource Protection Measures

Mitigation and Resource Protection Measures that apply to Alternative E are described later in this chapter.

## Alternative G (Preferred)

Alternative G is the Forest Service Preferred Alternative. A **Preferred Alternative** is the set of actions, which, the agency believes, would best fulfill its statutory mission and responsibilities, considering environmental, social, economic, and other factors disclosed in an environmental impact statement

Maps 19, 20, 21, 22, 23, 24, 30, 31, 34 and 35 show the locations of actions included in Alternative G.

### Introduction

Alternative G places an emphasis on using active management to achieve post-fire recovery, particularly in response to the purpose and need to develop a long-term sustainable forest that is maintainable by re-introduction of fire, while providing some recovery of merchantable timber. It focuses on fuels reduction and long-term fire suppression effectiveness.

### Key Issues

This alternative was developed in response to the following *key issues*:

*Recovery Using a Limited-Intervention Approach vs. Recovery Using a Full Range of Active Management Practices, Including Commercial Salvage.* Alternative G proposes more active management practices as a means of achieving long-term recovery than does Alternative C. In order to promote long-term recovery, Alternative G includes proposals for fuels reduction that exceed those included in Alternative C. Specifically, 6,728 acres that would not receive fuels treatment in Alternative C, would receive treatment in Alternative G. These include areas that are either:

1. In salvage units within  $\frac{1}{4}$  mile of the boundary between National Forest System lands and private lands in which the majority of the acres would not be expected to exceed 20 tons of fuel per acre within 15 years if no action is taken, or
2. In areas outside of salvage units altogether, within  $\frac{1}{4}$  mile of the boundary between National Forest System lands and private lands, regardless of predicted fuel loading.

Fuels conditions often vary between public and private lands. Fires that burn across public - private land boundaries can add to the complexity of both suppression and restoration efforts. The purpose of the treatment in the  $\frac{1}{4}$  mile zone is to provide fire protection to public lands as well as private lands that interface National Forest lands. The treatments

are intended to aid in the speed of fire suppression operations in handling a wildland fire moving onto or off of private lands. These treatments are also designed to facilitate the future application of prescribed fire on federal lands that are in proximity to private lands. Both of these (speed of suppression and use of prescribed fire) aid in the development of sustainable ponderosa pine forests by preventing future high intensity large-scale stand replacement wildfire from occurring.

*Changes in Motorized Access.* In response to public concern about the appropriateness of reducing motorized access, Alternative G offers road management proposals that differ from Alternative C. Specifically, Alternative G would implement road closure or decommissioning simply to the point of meeting maximum open road densities within LRMP Standards and Guidelines. Since a primary theme of Alternative G is Fuels Reduction and Long Term Suppression Effectiveness, maintaining a higher road density than proposed in Alternative C could, under some circumstances, provide an added measure of open road access during initial response to fire starts. Retention of motorized access within former Klamath Indian Reservation lands was a consideration in developing road management proposals. Specifically, only those roads that were recommended for decommissioning by the roads analysis process are scheduled for treatment. Other roads within the former Klamath Indian Reservation boundary that have less pressing need for treatment and were recommended for simple closure by the roads analysis process would be left open

**Actions**

<b><u>Alternative G</u></b>	
<i>At a Glance.....</i>	
Commercial Salvage (Total Acres of Harvest)	14,419 acres
(subset of the above) Commercial Salvage in Riparian Habitat Conservation Areas, other than in Roadside Hazard Corridors (Acres of Harvest)	394 acres
Snag Retention (Percent of Identified Optimal Habitat Retained) – Of 2,689 acres of identified optimal habitat for black-backed and Lewis’ woodpecker	71%
Precommercial Thinning (Acres)	2,214 acres
Reforestation (Total Planting Acres / Site Prep Acres)	20,728 acres / 3,580 acres
Fuels Treatments and Reductions (Acres of Fuels Reduction):	
• In ground-based units, additional to yard-tops-attached or whole-tree-yard	11,354 acres
• Additional reductions within ¼ mile of Private Land, outside of units	5,596 acres
• Prescribed Fire, outside of salvage units	3,572 acres
Road Management (Percent of Existing Road Miles):	
• Left Open	70%
• Decommissioned	26%
• Closed	4%
Temporary Road Development (Miles: Re-open Existing / New Construction)	21.4 miles / 16.0 miles
Road Reconstruction (Miles of Re-surfacing)	10.9 miles
Does Alternative Propose the Following Soil and Riparian Protection and Restoration Projects? (Yes or No):	
• Aspen Enhancement	Yes
• Placement of Large Woody Debris	Yes
• Deciduous Planting	Yes
• Road 2917413 Drainage Improvement	Yes

Some of the actions that require additional explanation, beyond that included in “Actions Common to All Fully Analyzed Action Alternatives” or the above display, are discussed immediately below. Comparisons of activity acres, mileages, and other categorizations are summarized in Table 2.14.

**Commercial Salvage (General)**

This alternative includes proposed commercial salvage similar to Alternative C, and includes salvage harvest of approximately 14,419 acres within a total of 311 harvest units. The Toolbox Fire portion includes 176 proposed harvest units and 135 harvest units are proposed within the Silver Fire portion. Total harvest volume is estimated to be 73.2 mmbf (million board feet).

Of the 311 salvage units in Alternative G, 297 units, totaling 13,970 acres, with an estimated timber volume of 69.3 mmbf, are proposed as ground-based. Fourteen salvage units in Alternative G, totaling 449 acres, with an estimated timber volume of 3.9 mmbf, are proposed as helicopter units. Information on a unit-by-unit basis is provided in Appendix B.

**Some Specific Types of Salvage Harvest (subsets of the above section):**

**Roadside Hazard Salvage** – See “Actions Common to All Fully Analyzed Action Alternatives”

**Commercial Salvage in Riparian Habitat Conservation Areas (Not in Roadside Hazard Corridors)**

Other than roadside hazard corridors, Alternative G includes 394 acres proposed for commercial salvage in RHCAs. This acreage is included in the 14,419 total acres of salvage. This includes 0 acres in Category 1 RHCA, 262 acres in Category 2 and 132 acres in Category 4 (there are no category 2 RHCAs in the project area). See “Actions Common to All Fully Analyzed Action Alternatives” for a description of design elements that would be used to meet Inland Native Fish Strategy (INFISH) Riparian Management Objectives.

**Snag Retention**

No-salvage areas have been selected following field inventory in fall 2002. The inventory identified approximately 2,689 acres that would provide optimal blocks of habitat for snag and down wood dependent species, including consideration for species that generally favor large snags (Lewis’ woodpecker) and those that favor smaller snags (black-backed woodpecker). For Alternative G, approximately 1,902 of these inventoried acres would be in “no-salvage” (or “no additional fuels treatment” within ¼ mile of the boundary between National Forest and private land) areas where all snags would be retained. For snag retention prescriptions within salvage units, see “Actions Common to All Fully Analyzed Action Alternatives”.

**Reforestation**

Factoring in the variation in current condition, it is estimated that 20,728 of the 34,000 acres discussed under “Actions Common to All Fully Analyzed Action Alternatives” would actually be planted. It is these “net” acres that are included in the table below. This includes approximately 10,489 acres of planting in proposed salvage units, 8,969 acres of planting in “other” areas (such as previous overstory removal units, previous partial cut units, or areas without a commercially viable salvage component) and 1,270 acres in existing plantations. Site preparation for reforestation outside of harvest would occur on approximately 3,580 acres.

The following table presents the most likely combination-of-activity scenarios and scheduling scenarios for reforestation, fuels treatment in areas to be planted, and site preparation that would occur under Alternative G.

**Table 2.9 - Alternative G Estimated Scheduling for Reforestation**

Year		Activity Combination								Total For Year
		Salvage Harvest; with Fuels Treatment ; Plant	Salvage Harvest; no Fuels Treatmnt ; Plant	Other (i.e. Previous Harvest);w ith Fuels Treatment	Other (i.e. Previous Harvest); No Site Prep; Plant	Other (i.e. Previous Harvest); with Site Prep; Plant	Plantation; no Site Prep; Plant	Plantation; with Site Prep; Plant	Estm. Re-plant*	
		Est. Acres	Est. Acres	Est. Acres	Est. Acres	Est. Acres	Est. Acres	Est. Acres	Est. Acres	
2004	Site Prep					1000				1000
	Fuels Tr.									
	Plant									
2005	Site Prep					2180				2180
	Fuels Tr.	4500								4500
	Plant		1638		3290					4928
2006	Site Prep									
	Fuels Tr.	4351								4351
	Plant	1500				2180	332	938		4950
2007	Site Prep									
	Fuels Tr.			1499						1499
	Plant	5000								5000
2008	Site Prep									
	Fuels Tr.			1000						1000
	Plant	2351		1499		1000				4850
2009	Site Prep								400	400
	Fuels Tr.									
	Plant			1000					4000	5000
Proposed Scheduling is subject to change as project progresses: (i.e. 2006 planting may need modification if unable to plant non-site-prepped areas due to safety concerns; if so, those acres would be site prepped starting in 2007 to retain habitat until that time, and then planted)										<b>Grand Total*</b>
<b>Total Site Prep</b>						<b>3180</b>			<b>400</b>	<b>3580</b>
<b>Total Fuels Treat</b>		<b>8851</b>		<b>2499</b>						<b>11350</b>
<b>Total Plant*</b>		<b>8851</b>	<b>1638</b>	<b>2499</b>	<b>3290</b>	<b>3180</b>	<b>332</b>	<b>938</b>		<b>20728</b>

\* Grand Total of acres planted does not include re-planting. Re-planting would occur in areas where low seedling survival occurred.

### Fuels Treatments and Reductions

Limbs and tops piled at the landing would be disposed of later or utilized as chips or firewood. This determination would be made during post-sale monitoring. If utilization of piles were not feasible, approximately 1,300 landing piles would be burned.

Within salvage units, fuels treatment in addition to whole tree yarding and leaving tops attached would occur on approximately 11,354 acres. This would include reduction of fuels created by the fire and by salvage activity. As with Alternative C, fuels treatment in addition to whole tree yarding would occur in salvage units in which the majority of the acres would be expected to exceed 20 tons of fuel per acre within 15 years if no action is taken. See Appendix B for unit specific information.

Alternative G includes proposals for fuels treatment in areas that would not receive fuels treatment under the criteria used in Alternative C. These include areas within harvest units (within ¼ mile of the boundary between National Forest and private) in which the majority of the acres would not be expected to exceed 20 tons of fuel per acre within 15 years if no action is taken. This accounts for 1,132 acres, which are included in the total of 11,354 acres reported above. Alternative G also includes fuels treatment in areas outside of salvage units altogether, that are within conifer ecotypes (excluding juniper) and that are within ¼ mile of the boundary between National Forest System lands and private lands, regardless of

predicted fuel loading. This accounts for approximately 5,596 acres. Treatments in this ¼ mile buffer zone would include ladder fuel reduction treatments, prescribed burning, and a variety of other fuels treatments that would allow more control of both prescribed fire and of wildfire. The areas outside of harvest units include only those areas that are in a conifer ecotype. The area of buffer zone that overlaps the proposed prescribed burning would not receive ladder fuel reduction treatments, as design elements to achieve retention of wildlife cover. Approximately 10% of the area of in the proposed ¼ mile buffer zone is currently functioning as mule deer cover. None of these cover areas are within Winter Range. In the 10% of the buffer area that is mule deer cover, ladder fuel reductions would not occur. This limitation would result in retention of desired wildlife cover. Ladder fuel reduction treatments in all other areas would “slash” (thin) material less than 5 inches in areas with excessive trees. This would be followed by prescribed fire of some sort, such as underburning, hand pile and burn, jackpot burn.

### **Road Management**

Alternative G is partially responsive to the *Changes in Motorized Access* issue. In response to concern about motorized access to public lands, open road density in the project area as a whole (on National Forest System lands) would be reduced only down to the level contained in the LRMP standards and guidelines. Within the former Klamath Indian Reservation lands, only those roads that were recommended for decommissioning by the roads analysis process are scheduled for decommissioning. Other roads within the former Klamath Indian Reservation boundary that have less pressing need for treatment and were recommended for simple closure by the roads analysis process would be left open. Several roads (identified on Maps 21 and 22 and listed in Appendix E) would be either decommissioned or closed, for the purpose of promoting watershed recovery or reducing their impact on wildlife habitat. For Alternative G, approximately 10.4 miles of road would be closed (blocked), approximately 71.6 miles of road would be decommissioned, and approximately 188.9 miles of road would be left open. Road decommissioning is defined as activity that results in the stabilization and restoration of unneeded roads to a more natural state. As a result of these actions, open road density in the project area as a whole (on National Forest System lands) would drop to 2.57 miles per square mile.

### **Temporary Road Development**

Proposed temporary road development for this alternative would be the same as Alternative C.

### **Road Reconstruction**

Proposed road construction for this alternative would be the same as Alternative C.

### **Soil and Riparian Protection and Restoration Projects**

Proposed soil and riparian protection and restoration projects for this alternative would be the same as Alternative C.

### **Forest Plan Amendment**

Following the July 2002 fires, mule deer cover and habitat effectiveness in the project area is currently below Forest Plan standards and guidelines (see Chapter 3, Wildlife – Management Indicator Species – Mule Deer for details). Proposed prescribed burning in this alternative is expected to result in reduction of cover for mule deer in transition and summer ranges, in some areas (some subwatersheds). Alternatives G (and C) include proposals for 1,122 acres of prescribed burning that are additional to the 2,450 acres that are proposed in Alternatives D and H. The purpose of the prescribed burning is to promote the long-term development and maintenance of LOS forest conditions in some areas where the July 2002 fires did not result in stand replacement fire. In order to achieve a greater level of benefit related to that purpose, than would Alternatives D, E or H, this alternative would require a Forest Plan amendment. See Chapter 3 effects analysis for information on the expected effects of the proposed prescribed burning.

Since mule deer cover and habitat effectiveness is currently below standards and guidelines, and the prescribed burning would further lower mule deer cover, this alternative would require a site-specific amendment to the Forest Plan (1989). Specifically, Forest Plan Standards for **mule deer cover** would be amended to the levels identified in this alternative, within the project area, for:

- Summer range in the East Duncan, Lower Duncan and Upper Duncan Creek subwatersheds
- Transition range in the East Duncan Creek subwatershed

Forest Plan Standards for mule deer habitat effectiveness would be amended, within this project area, for:

- Summer range in the Lower Duncan Creek subwatershed

Specifically, the Forest Plan Standards would be amended to allow the following small reductions in cover or habitat

effectiveness:

- Summer range **Cover** in the East Duncan: Reduction of cover on 231 acres that would reduce cover from 11.0% to 9.4%
- Summer range **Cover** in Lower Duncan: Reduction of cover on 96 acres that would reduce cover from 5.4% to 4.4%
- Summer range **Cover** in Upper Duncan Creek: Reduction of cover on 100 acres that would reduce cover from 19.8% to 19.6%
- Transition range **Cover** in the East Duncan: Reduction of cover on 33 acres that would reduce cover from 5.9% to 5.6%
- Summer Range **Habitat Effectiveness** in Lower Duncan: Reduction from 1.8% to 1.7%

### **Mitigation and Resource Protection Measures**

Mitigation and Resource Protection Measures that apply to Alternative G are described later in this chapter.

## **Alternative H**

Maps 25, 26, 27, 28, 29, 30, 31, 34 and 35 show the locations of actions included in Alternative H.

### **Introduction**

Alternative H focuses on wildlife habitats and on contributing to the long-term development of LOS while providing some recovery of merchantable timber.

### **Key Issues**

This alternative was developed in response to the following *key issues*:

*Effects on Wildlife Habitat.* Salvage units or portions of salvage units that are proposed in Alternative C were not included in Alternative H if they were in the bald eagle management area (located in the Lower Duncan Creek subwatershed). Most areas that were determined to be optimal habitat for snag and down wood-dependent species have been excluded from proposed salvage with Alternative H. Prescribed fire has been limited to areas that are:

- non-cover (current condition) and
- in mule deer summer range.

*Effects on Soils, Watersheds, and Aquatic Habitat.* In order to eliminate the potential for adverse effects to RHCAs, no units (other than roadside hazard treatment) are proposed for commercial salvage that are within any portion of any category of Riparian Habitat Conservation Area.

**Actions**

<b>Alternative H</b>	
<i>At a Glance.....</i>	
Commercial Salvage (Total Acres of Harvest)	13,031 acres
(subset of the above) Commercial Salvage in Riparian Habitat Conservation Areas, other than in Roadside Hazard Corridors (Acres of Harvest)	0 acres
Snag Retention (Percent of Identified Optimal Habitat Retained) – Of 2,689 acres of identified optimal habitat for black-backed and Lewis’ woodpecker	92%
Precommercial Thinning (Acres)	2,214 acres
Reforestation (Total Planting Acres / Site Prep Acres)	20,721 acres / 4,695 acres
Fuels Treatments and Reductions (Acres of Fuels Reduction):	
• In ground-based units, additional to yard-tops-attached or whole-tree-yard	9,070 acres
• Additional reductions within ¼ mile of Private Land, outside of units	none
• Prescribed Fire, outside of salvage units	2,450
Road Management (Percent of Existing Road Miles):	
• Left Open	47%
• Decommissioned	26%
• Closed	27%
Temporary Road Development (Miles: Re-open Existing / New Construction)	19.7 miles / 14.9 miles
Road Reconstruction (Miles of Re-surfacing)	10.9 miles
Does Alternative Propose the Following Soil and Riparian Protection and Restoration Projects? (Yes or No):	
• Aspen Enhancement	Yes
• Placement of Large Woody Debris	Yes
• Deciduous Planting	Yes
• Road 2917413 Drainage Improvement	Yes

Some of the actions that require additional explanation, beyond that included in “Actions Common to All Fully Analyzed Action Alternatives” or the above display, are discussed immediately below. Comparisons of activity acres, mileages, and other categorizations are summarized in Table 2.14.

**Commercial Salvage (General)**

This includes salvage harvest of approximately 13,031 acres in a total of 288 harvest units within the project area boundary. The Toolbox fire portion includes 161 proposed harvest units and 127 harvest units are proposed within the Silver Fire portion. Total harvest volume is estimated to be 63.8 mmbf (million board feet). All 288 salvage units in Alternative H are proposed as ground-based. Information on a unit-by-unit basis is provided in Appendix B.

**Some Specific Types of Salvage Harvest (subsets of the above section):**

**Roadside Hazard Salvage** – See “Actions Common to All Fully Analyzed Action Alternatives”

**Commercial Salvage in Riparian Habitat Conservation Areas (Not in Roadside Hazard Corridors)**

None.

**Snag Retention**

No-salvage areas have been selected following field inventory in fall 2002. The inventory identified approximately 2,689 acres that would provide optimal blocks of habitat for snag and down wood nesters, including consideration for species that generally favor large snags (Lewis’ woodpecker) and those that favor smaller snags (black-backed woodpecker). For

Alternative H, approximately 2,484 of these inventoried acres would be in “no-salvage” areas where all snags would be retained.

For snag retention prescriptions within salvage units, see “Actions Common to All Fully Analyzed Action Alternatives”.

**Reforestation**

Factoring in the variation in current condition, it is estimated that 20,721 of the 34,000 acres discussed under “Actions Common to All Fully Analyzed Action Alternatives” would actually be planted. It is these “net” acres that are included in the table below. This includes approximately 9,485 acres of planting in proposed salvage units, 9,966 acres of planting in “other” areas (such as previous overstory removal units, previous partial cut units, or areas without a commercially viable salvage component) and 1,270 acres in existing plantations. Site preparation for reforestation outside of harvest would occur on approximately 4,695 acres.

The following table presents the most likely combination-of-activity scenarios and scheduling scenarios for reforestation, fuels treatment in areas to be planted, and site preparation that would occur under Alternative H.

**Table 2.10 - Alternative H Estimated Scheduling for Reforestation**

Year		Activity Combination						Estimated Re-plant*	TOTAL For YEAR
		Salvage Harvest; with Fuels Treatment; Plant	Salvage Harvest; no Fuels Treatment; Plant	Other (i.e. Previous Harvest); no Site Prep; Plant	Other (i.e. Previous Harvest); with Site Prep; Plant	Plantation; no Site Prep; Plant	Plantation; with Site Prep; Plant		
		Est. Acres	Est. Acres	Est. Acres	Est. Acres	Est. Acres	Est. Acres		
2004	Site Prep				1000				1000
	Fuels Tr.								
	Plant								
2005	Site Prep				2295				2295
	Fuels Tr.	4000							4000
	Plant		1950	3000					4950
2006	Site Prep				1000				1000
	Fuels Tr.	3535							3535
	Plant	1500		2671		332	400		4903
2007	Site Prep								
	Fuels Tr.								
	Plant	5000							5000
2008	Site Prep						400		400
	Fuels Tr.								
	Plant	1035			3595		538		5168
2009	Site Prep								
	Fuels Tr.								
	Plant				700		4000		4700
Proposed Scheduling is subject to change as project progresses: (i.e. 2006 planting may need modification if unable to plant non-site-prepped areas due to safety concerns; if so, those acres would be site prepped starting in 2007 to retain habitat until that time, and then planted)									<b>GRAND TOTAL*</b>
<b>Total Site Prep</b>					<b>4295</b>			<b>400</b>	<b>4695</b>
<b>Total Fuels Treat</b>		<b>7535</b>							<b>7535</b>
<b>Total Plant*</b>		<b>7535</b>	<b>1950</b>	<b>5671</b>	<b>4295</b>	<b>332</b>	<b>938</b>		<b>20721</b>

\* Grand Total of acres planted does not include re-planting. Re-planting would occur in areas where low seedling survival occurred.

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### **Fuels Treatments and Reductions**

Limbs and tops piled at the landing would be disposed of later or utilized as chips or firewood. This determination would be made during post-sale monitoring. If utilization of piles were not feasible, approximately 1,175 landing piles would be burned.

Alternative H follows the same principles as Alternative C, but due to somewhat less areas of harvest, there would be less fuel treatment. Within salvage units, fuels treatment in addition to whole tree yarding and leaving tops attached would occur on approximately 9,070 acres. This would include reduction of fuels created by the fire and by salvage activity. These treatments are planned for salvage units in which the majority of the acres would be expected to exceed 20 tons of fuel per acre within 15 years if no action is taken. See Appendix B for unit specific information.

### **Road Management**

Alternative H is partially responsive to the *Changes in Motorized Access* issue. While open road density in the project area as a whole (on National Forest System lands) would be reduced to a level below the maximum contained in the LRMP Standards and Guidelines, within the former Klamath Indian Reservation lands only those roads that were recommended for decommissioning by the roads analysis process are scheduled for decommissioning. Other roads within the former Klamath Indian Reservation boundary that have less pressing need for treatment and were recommended for simple closure by the roads analysis process would be left open. Several roads (identified on Maps 27 and 28 and listed in Appendix E) would be either decommissioned or closed, for the purpose of promoting watershed recovery or reducing their impact on wildlife habitat. For Alternative H, approximately 72.9 miles of road would be closed (blocked), approximately 71.6 miles of road would be decommissioned, and approximately 126.5 miles of road would be left open. As a result of these actions, open road density in the project area as a whole (on National Forest System lands) would drop to 1.72 miles per square mile.

### **Temporary Road Development**

The salvage harvest activities in Alternative H are expected to require the use of approximately 34.6 miles of temporary road. About 19.7 miles, of the 34.6-mile total would simply involve the re-opening of existing unclassified roads and approximately 14.9 miles of temporary road would require new construction. The re-opening would be on approximately 48 short, separate roads, ranging in length between 0.02 miles and 1.06 miles. The new construction would be on approximately 58 short, separate roads, ranging in length between 0.06 miles and 0.72 miles.

### **Road Reconstruction**

The proposed road constriction for this alternative would be the same as Alternative C.

### **Soil and Riparian Protection and Restoration Projects**

Other than road management activities, as described above, the following types of soil and riparian protection and restoration projects would be implemented: aspen protection and enhancement, placement of large woody debris in perennial stream, deciduous planting in riparian areas, and drainage improvement on the access road to "Bunyard Crossing." See "Actions Common to All Fully Analyzed Action Alternatives"

### **Forest Plan Amendment**

No Forest Plan amendment would be required to implement Alternative H.

### **Mitigation and Resource Protection Measures**

Mitigation and Resource Protection Measures that apply to Alternative H are described beginning on the next page.

## Mitigation and Resource Protection Measures

These design features, as well as the following mitigation measures, are an integral part of each of the action alternatives. They are listed here separately to avoid repeating them in each alternative description.

### Wildlife:

<b>Provide Wildlife Habitat</b>	<b>Alternative</b>
Where hand piling is the prescribed fuel treatment method, leave 10-30% of the piles unburned and distributed throughout the units where visual quality objectives can be met.	C,D,E,G,H
Existing down wood, included those cut during fire suppression, within commercial salvage units, may be removed to the extent that a minimum of 80 lineal feet per acre will remain.	C,D,E,G,H
Trees needing removal for road maintenance purposes will be removed	
To the extent possible, no conifer seedlings will be planted within 50-150 feet of any deciduous vegetation.	C,D,E,G,H
<b>Timing Restrictions</b>	<b>Alternative</b>
<p>Restrict all activities during the bald eagle breeding season as follows (January 15-August 31):</p> <ol style="list-style-type: none"> <li>0.25 mile buffer around nest for visually disturbing activities (e.g. parking vehicles, tree marking, planning, etc.) and noise disturbing activities (e.g. falling, hauling, chainsaws, heavy equipment use, etc.). Maps on file at the Silver Lake Ranger District. Harvest units 19 and 21 All activities taking place within 0.25 mile buffer</li> <li>0.5 mile buffer around nest for visually disturbing activities (e.g. parking vehicles, tree marking, planning, etc.) and noise disturbing activities (e.g. falling, hauling, chainsaws, heavy equipment use, etc.) that are in line of site of the nest. Maps on file at the Silver Lake Ranger District. Harvest Unit 21</li> <li>0.5 mile buffer around three known nests for helicopter use (e.g. flight paths, landings, etc.) Maps on file at the Silver Lake Ranger District.</li> </ol> <p>In areas that are using a buffer to minimize disturbance, monitoring would occur during the first three days of operation, if activities were to occur during the breeding season. The monitoring would be used to determine if the buffer is effective at preventing disturbance. If a buffer is found to be ineffective, a larger buffer would be designed, based on site-specific observations made during monitoring.</p> <p>If a Forest Service Wildlife Biologist determines that an activity will not result in reproductive failure or cause adverse affects to nesting eagles for that year, activity may be allowed on a case-by-case basis. Any activities allowed should occur as late in the breeding season as possible and after the eggs have hatched. If an activity is allowed to proceed, monitoring of the nest site must take place to determine if adverse affects to nesting eagles are occurring. If monitoring determines there are unacceptable affects to nesting eagles, the activity must be terminated immediately. If it is determined the eagles have not successfully nested by May15, the restrictions may be lifted around the nest site for that year.</p>	<p>C,D,E,G C,D,E,G,H</p> <p>C,D,E,G</p> <p>C,D,E,G,H</p>

**Wildlife (continued):**

<b>Timing Restrictions</b>	<b>Alternative</b>
<p>Restrict all project activities during the peregrine breeding season as follows (February 1-August 15):</p> <p>1. 0.25 mile buffer around nest for visually disturbing activities (e.g. parking vehicles, tree marking, planning, etc.) and noise disturbing activities (e.g. falling, hauling, chainsaws, heavy equipment use, etc.). Maps on file at the Silver Lake Ranger District. All activities taking place within 0.25 mile buffer</p> <p>2. 0.5 mile buffer around the nest for helicopter use (e.g. flight paths, landings, etc.). Maps on file at the Silver Lake Ranger District.</p> <p>The first three days of implementation of a buffer to minimize disturbance would be monitored if activities occur during the breeding season, specifically to determine if the buffer is effective at preventing disturbance. If the buffer is found to not be effective, a larger buffer would be implemented based on recommendations from the monitoring regarding site-specific observations.</p> <p>If a Forest Service Wildlife Biologist determines that an activity will not result in reproductive failure or cause adverse affects to nesting falcons for that year, it may be allowed on a case-by-case basis. Any activities allowed should occur as late in the breeding season as possible and after the eggs have hatched. Monitoring of the nest site must take place if an activity is allowed to determine if adverse affects to nesting falcons are occurring. If monitoring determines there are unacceptable affects to nesting falcons, the activity must be terminated immediately. At the discretion of a wildlife biologist, if it is determined the falcons have not successfully nested by May15 the restrictions may be lifted around the nest site for that year.</p>	<p>C,D,E,G,H</p> <p>C,D,E,G,H</p>
Restrict all activities during fawning season between May 1 – June 30 except for a short-term entry for planting which may occur between May 1 – May 15. Units 129, 130, 131, 195, 196, 197	C,G,H
Restrict all activities during fawning season between May 1 – June 30 except for a short-term entry for planting which may occur between May 1 – May 15. Units 129, 131, 197	D
Restrict all activities during fawning season between May 1 – June 30 except for a short-term entry for planting which may occur between May 1 – May 15. Units 130, 131	E
Should any listed endangered, threatened, or sensitive species be found during project activities within, adjacent, or near enough to the project that that activities could be a disturbance, activities will be halted until their effects can be determined and their significance assessed.	C,D,E,G,H
If an active raptor nest is found during operation, LRMP Standards and Guidelines will be followed at a minimum. The LRMP states that “major activities such as logging and road construction adjacent (300 yards) to active raptor nests, should be postponed until young have fledged (usually around July 30)” (LRMP, page 108). The Forest Service Wildlife Biologist will be contacted.	C,D,E,G,H
<b>Snags Retention</b>	<b>Alternative</b>
<p><b>Distribution</b> – Retain snags in groups of varying size distributed across a treatment area.</p> <p><b>&lt;50% Mortality Areas:</b> Within a 10 acre area, a <i>minimum</i> of 1 snag clump with 20 trees is required, with the exception of narrow units or parts of units that are less than 500 feet wide and are surrounded on one side of the 500 foot band by a stand in which 50% of the trees &gt;10 inches are dead. Snag clumps would range from 2-30 snags per clump. In areas where snags are intermixed within a green overstory, smaller clumps are encouraged to provide for a better distribution of snags across the unit. In areas of localized mortality &gt;5 acres, larger snag clumps are encouraged.</p> <p><b>&gt;50% Mortality Areas:</b> Within a 10 acre area, a <i>minimum</i> of 1 snag clump with 50 trees is required, with the exception of narrow units or parts of units that are less than 500 feet wide and are surrounded on one side of the 500 foot band by a stand in which 50% of the trees &gt;10 inches are dead. Snag clumps would range from 50-100 snags per clump, and clumps would be distributed every 5-10 acres.</p> <p><b>Areas requiring site-prep outside of harvest units and plantations:</b> Leave a one acre snag clump every 5 acres.</p>	C,D,E,G,H

**Wildlife (continued):**

<b>Snags Retention</b>	<b>Alternative</b>
<b>Shape</b> – Groups of snags should vary in size (see above), shape (circle, oblong, etc.), orientation (vertical – parallel to slope or horizontal - across slope), and snag stocking.	C,D,E,G,H
<b>Species</b> – The desired species of snags in order of preference is: ponderosa pine, lodgepole pine, and white fir. However, tree species in snag clumps should be representative of the stand.	C,D,E,G,H
<b>Size of Individuals</b> – The size in terms of diameter at breast height should reflect the size classes present in the stand, favoring larger diameter snags where available.	C,D,E,G,H
<b>Placement</b> –No area greater than 10 acres should be left completely deficient of snags. Generally, snag groups should be located greater than 200’ from a road. If snag groups are located within 200’ of a road for visual quality, snags should be selectively marked to ensure they are not tall enough to fall on a road.	C,D,E,G,H
<b>Older snags</b> - Older snags (snags which existed as snags prior to the fires) and broken top trees will be protected to the extent practicable. Groups of new snags should be focused in the area around older snags where the opportunity exists. OSHA standards for providing safety from falling snags shall be adhered to. Where conflicts between logging systems, safety, and the need to retain snags exist, a wildlife biologist will be consulted.	C,D,E,G,H

**Recreation:**

<b>Recreation Facility Protection – During Salvage Operations</b>	<b>Facility/ Unit “Pool” (* = helicopter unit)</b>	<b>Alternative</b>
1. Material to be salvaged within 150 feet of the Fremont National Recreation Trail (NRT) or a developed recreation site will be directionally felled, skidded, or yarded away from the constructed feature wherever practical.	NRT 1,6,11,12*,18,19,20,36*41,142,143,148,149,150,169,170,171,172,173,174,175,176,216,217,218,219,221,234,245, 249	C & G - All Units Listed at Left D – 6,12*,19,35,41,142,148,169,175, 216,217, 234,245,249 E – All Units except 12*,36*,150,170,176,231 H – All units except 12*,36*,231
	Fremont Pt - 174,175	C, E, G, H – All Units Listed D – 175 only
	Bunyard Crossing - 177*, 182	C & G – 177*, 182 D, E, & H – 182
	Silver Cr CG - 217	C – 217
2. Crossings of the NRT with skidding equipment will be minimized, with the optimum number of crossings being none.	NRT 1,6,11,12*,18,19,20,36*41,142,143,148,149,150,169,170,171,172,173,174,175,176,216,217,218,219,221,234,245, 249	C & G - All Units Listed at Left D – 6,12*,19,35,41,142,148,169,175, 216,217, 234,245,249 E – All Units except 12*,36*,150,170,176,231 H – All units except 12*,36*,231
3. If crossings of the NRT are unavoidable, within practical limits, the impacted portions of trail tread will be rehabilitated.	NRT 1,6,11,12*,18,19,20,36*41,142,143,148,149,150,169,170,171,172,173,174,175,176,216,217,218,219,221,234,245, 249	C & G - All Units Listed at Left D – 6,12*,19,35,41,142,148,169,175, 216,217, 234,245,249 E – All Units except 12*,36*,150,170,176,231 H – All units except 12*,36*,231

**Recreation (continued):**

<b>Recreation Facility Protection – During Salvage Operations</b>	<b>Facility/ Unit “Pool” (* = helicopter unit)</b>	<b>Alternative</b>
4. Use existing landings or new landings 200 feet or further away from the NRT or developed recreation sites, preferably screened from the trail by residual forest or topography, unless no practical options exist.	NRT 1,6,11,12*,18,19,20,36*41,142,143,148,149,150,169,170,171,172,173,174,175,176,216,217,218,219,221,234,245, 249	– C & G - All Units Listed at Left D – 6,12*,19, 35,41,142,148,169,175, 216,217, 234,245,249 E – All Units except 12*,36*,150,170,176,231 H – All units except 12*,36*,231
	Fremont Pt - 174,175	C, E, G, H – All Units Listed D – 175 only
	Bunyard Crossing - 177*, 182	C & G – 177*, 182 D, E, & H – 182
	Silver Cr Marsh CG - 217	C - 217
5. Areas of light project-generated slash in close proximity to trails will be lopped and scattered a minimum of 15 feet off of trail tread.	NRT 1,6,11,12*,18,19,20,36*41,142,143,148,149,150,169,170,171,172,173,174,175,176,216,217,218,219,221,234,245, 249	– C & G - All Units Listed at Left D – 6,12*,19, 35,41,142,148,169,175, 216,217, 234,245,249 E – All Units except 12*,36*,150,170,176,231 H – All units except 12*,36*,231
6. Heavy project-generated slash requiring piling in the vicinity of trails or developed recreation sites will be piled a minimum of 50 to 75 feet away from the trail, any constructed feature, or other improvements, utilizing natural visual screening wherever practical.	NRT 1,6,11,12*,18,19,20,36*41,142,143,148,149,150,169,170,171,172,173,174,175,176,216,217,218,219,221,234,245, 249	– C & G - All Units Listed at Left D – 6,12*,19, 35,41,142,148,169,175, 216,217, 234,245,249 E – All Units except 12*,36*,150,170,176,231 H – All units except 12*,36*,231
	Fremont Pt - 174,175	C, E, G, H – All Units Listed D – 175 only
	Bunyard Crossing - 177*, 182	C & G – 177*, 182 D, E, & H - 182
	Silver Cr Marsh CG - 217	C - 217
7. Pole Butte Snowmobile & Nordic Trail will be temporarily closed during project operations upon, or immediately adjacent to, the roads that comprise the route.	Pole Butte Snowmobile and Nordic Trail – 131, 132, 133, 134	C, D, E, G, H – All units listed at left

**Recreation (continued):**

<b>Recreation Facility Protection – During Salvage Operations</b>	<b>Facility/ Unit “Pool” (* = helicopter unit)</b>	<b>Alternative</b>
8. All developed recreation sites and any portions of the NRT adjacent to helicopter units and located under fly-over routes to be used for aerial log retrieval operations will be temporarily closed until such operations are completed.	NRT – 12*, 36*	C & G - 12*, 36* D – 12*
	Bunyard Crossing – 177*	C & G – 177*
9. Planting will not occur within the constructed eighteen to thirty-six inch width of the NRT tread and within 6 feet of either side of the centerline of the NRT.	NRT 1,6,11,12*,18,19,20,36*41,142,143,148,149, 150,169,170,171,172,173,174,175,176,216, 217,218,219,221,234,245, 249	– C & G - All Units Listed at Left D – 6,12*,19, 35,41,142,148, 169,175, 216,217, 234,245,249 E – All Units except 12*,36*,150, 170,176,231 H – All units except 12*,36*,231
10. Future thinning of reforested areas immediately adjacent to the trails or developed recreation sites will avoid impacting the constructed features with slash by utilizing the strategies outlined in Mitigation Measures 5 & 6 listed above.	NRT 1,6,11,12*,18,19,20,36*41,142,143,148,149, 150,169,170,171,172,173,174,175,176,216, 217,218,219,221,234,245, 249	– C & G - All Units Listed at Left D – 6,12*,19, 35,41,142,148, 169,175, 216,217, 234,245,249 E – All Units except 12*,36*,150, 170,176,231 H – All units except 12*,36*,231
	Fremont Pt - 174,175	C, E, G, H – All Units Listed D – 175 only
	Bunyard Crossing - 177*, 182	C & G – 177*, 182 D, E, & H - 182
	Silver Cr Marsh CG - 217	C - 217

**Aquatics and Soils:****RHCAs (All Alternatives/All Units)**

If unmapped RHCAs are discovered during layout or implementation, for example isolated seeps and springs, the same protective measures that are detailed earlier in Chapter 2, would be applied.

**Roadside Hazard RHCA Units (All Alternatives)**

- Individual tree marking will occur in roadside hazard units within Riparian Habitat Conservation Areas, where determined necessary to provide RHCA protection.
- Minimize line-pulling distances to limit soil disturbance and avenues of sediment transport to stream channels.
- No mechanized ground based skidding equipment allowed within the first 150 feet on Category 1 RHCAs and within 50 feet of stream channel on Category 3 & 4 RHCAs. Harvest activity will be permitted within the entire width of RHCAs by operating on existing roads.

- In order to decrease the hazard of culvert plugging, minimize the amount of slash and debris remaining on the ground immediately upstream of any culvert. Whole tree yard trees where possible, and scatter any slash away from culvert openings.

RHCA 1 – Unit Numbers 179, 217, 220, 236, 245, 261

RHCA 3 – Unit Numbers 10, 13, 15, 17, 33, 49, 52, 54, 69, 77, 88, 89, 90, 118, 123, 124, 126, 179, 182, 191, 193, 217, 220, 225, 227, 230, 236, 296, 301, 302, 303, 309, 310

RHCA 4 – Unit Numbers 29, 30, 49, 77, 84, 131, 236, 273, 274, 275, 278, 291

### **Soils (All Alternatives)**

The guidelines in the soil productivity guide (USDA, 2000) shall be followed for the protection of soil during any project activity (See Appendix C – Mitigation Details, for the complete content of the Soil Productivity Guide).

### **Best Management Practices/Fremont N.F. Supplement (All Alternatives)**

Best management practices (BMPs) are the primary mechanisms to enable the achievement of water quality standards (Environmental Protection Agency, 1987). BMPs have been selected and tailored for site-specific conditions. The BMPs are a supplement to the General Water Quality Best Management Practices, Pacific Northwest Region, 1988. The Practices apply to road management activities implemented through timber sale contracts, public works contracts, and forest accounts. BMPs can be found in Appendix C – Mitigation Details.

The interdisciplinary team (soil/water/fish) specialists are responsible for including the BMPs in the Environmental Assessment (EA) or Environmental Impact Statement (EIS) for purposes of implementation on the ground. The interdisciplinary team should review the marking guide and contract documents to ensure inclusion of the BMPs.

Mitigation measures shown in the BMPs shall be incorporated into the timber sale marking guide and the timber sale contract, as appropriate. Completion of environmental analyses and project implementation is the responsibility of the District Ranger. The Silviculturist should ensure inclusion of the BMPs in the marking guide and the Timber Management Assistant (TMA) in the timber sale contract. The Sale Administrator is responsible for following through with implementation of the BMPs and EA as incorporated into the timber sale contract. It is the responsibility of the pre-construction engineer to ensure inclusion of BMPs into the road survey and design package. The Engineering Representative (ER) is responsible for following through with implementation on the ground.

In both timber sale contracts and public works contracts, mitigations found in the following BMPs should be included in the contract provisions and special project specifications. It is the responsibility of the pre-construction engineer to ensure inclusion of BMPs in the public works package. The Contracting Officer's Representative (COR) is responsible for following through with implementation on the ground.

### **Sensitive Plants/Noxious Weeds:**

Objectives/Mitigation Measures & Management Requirements	<u>Alternatives</u>
<b>Protect TES plant populations and their habitat</b>	
<b>Protected</b> <i>Castilleja chlorotica</i> habitats are to be excluded during layout from all ground disturbing activities to comply with the Conservation Strategy for <i>Castilleja chlorotica</i> .	C, D, E, G, H
Harvest Unit #166 borders <b>protected</b> <i>Castilleja chlorotica</i> habitat. Within this harvest unit, trees that could potentially reach the protected habitat will be directionally felled to avoid the <i>Castilleja chlorotica</i> . Trained Botanical personnel will monitor the unit boundary location to ensure <i>Castilleja chlorotica</i> is excluded.	C, D, E, G, H

**Sensitive Plants/Noxious Weeds (continued):**

Objectives/Mitigation Measures & Management Requirements	<u>Alternatives</u>
Harvest Units #173 and #174 border <b>protected</b> <i>Castilleja chlorotica</i> habitat. Within these harvest units, trees that could potentially reach the protected habitat will be directionally felled to avoid the <i>Castilleja chlorotica</i> . Trained botanical personnel will monitor the unit boundary to ensure <i>Castilleja chlorotica</i> is excluded.	C, E, G, H
<b>Managed</b> <i>Castilleja chlorotica</i> habitat falls within Harvest Units #131, #134, and #173. To minimize damage to existing plants, trained botanical personnel will monitor unit layout to ensure skid trails and landings have minimal impacts on the plants. In addition, trees within these units that could potentially reach the managed habitat when cut should be directionally felled to avoid the managed habitat area.	C, E, G, H
<b>Managed</b> <i>Castilleja chlorotica</i> habitat falls within Harvest Unit #172. To minimize damage to existing plants, trained botanical personnel will monitor unit layout to ensure skid trails and landings have minimal impacts on the plants. In addition, trees within this unit that could potentially reach the managed habitat when cut should be directionally felled to avoid the managed habitat area.	C, G, H
Prescribed burning in areas buffering private lands will occur in Harvest Units #131 and #134. The <b>managed</b> <i>Castilleja chlorotica</i> habitat within these harvest units will be excluded from the burn boundary. Trained botanical personnel will monitor the burn boundary to ensure managed habitat is excluded.	C, E, G, H
In Harvest Unit 134, a temporary road is proposed to border the edge or into the <b>managed</b> <i>Castilleja chlorotica</i> habitat. To ensure all <i>Castilleja chlorotica</i> plants are excluded from the proposed roadbed, trained botanical personnel will assist in the temporary road location.	C, E, G, H
In Harvest Units 134, a temporary road is proposed to border the edge of the <b>managed</b> <i>Castilleja chlorotica</i> habitat. To ensure all <i>Castilleja chlorotica</i> is excluded from the proposed roadbed, trained botanical personnel will assist the Sale Administrator in locating the temporary road.	C, E, G, H
In Harvest Units 172 and 173, there is a proposed temporary road is proposed going into the <b>managed</b> <i>Castilleja chlorotica</i> habitat. Trained botanical personnel will work with the Sale Administrator to ensure that a minimal number of plants are affected.	C, E, G, H
Harvest Units 131 and 134 are subject to fuel treatment activities. Botanical personnel will mark the boundaries of the <b>managed</b> <i>Castilleja chlorotica</i> habitat within these units to ensure areas of plants are excluded from fuel treatment activities.	C, G, H
Harvest Unit #131 is subject to fuel treatments activities. Botanical personnel will mark the boundary of the <b>managed</b> <i>Castilleja chlorotica</i> habitat within the unit to ensure areas of plants are excluded from fuel treatment activities.	E
If site prep is needed within <b>managed</b> <i>Castilleja chlorotica</i> habitat within Harvest Units #131, #134, and #173, trained botanical personnel will locate each clump of <i>Castilleja chlorotica</i> . The site prep method conducted within the managed habitat will be the least invasive method, with no burning permitted.	C, E, G, H
If site prep is needed within <b>managed</b> <i>Castilleja chlorotica</i> habitat within Harvest Unit #172, trained botanical personnel will locate each clump of <i>Castilleja chlorotica</i> . The site prep method conducted within the managed habitat will be the least invasive method, with no burning permitted.	C, G, H
After surveying during the summer of 2003 for burn intensity within the <b>managed</b> <i>Castilleja chlorotica</i> habitats, the extent of damage will be determined. If a managed site does not have sagebrush remaining, then it can be assumed <i>Castilleja chlorotica</i> will vanish from the area. If some sagebrush habitat survived the fire, then <i>Castilleja chlorotica</i> can be expected to remain on the site. With the current stocking standards, no more than 40 percent canopy closure should occur. Therefore, habitat for <i>Castilleja chlorotica</i> will continue to exist. At this point, it will be assumed that Harvest Units #131, #134, and #173 have sagebrush habitat remaining. The fall before planting is scheduled to occur, trained botanical personnel will place flag pins at each clump of <i>Castilleja chlorotica</i> . This will allow the planters to avoid planting the trees directly on <i>Castilleja chlorotica</i> plants.	C, E, G, H

**Sensitive Plants/Noxious Weeds (continued):**

<b>Objectives/Mitigation Measures &amp; Management Requirements</b>	<b><u>Alternatives</u></b>
After surveying during the summer of 2003 for burn intensity within the <b>managed</b> <i>Castilleja chlorotica</i> habitats, the extent of damage will be determined. If a managed site does not have sagebrush remaining, then it can be assumed <i>Castilleja chlorotica</i> will vanish from the area. If some sagebrush habitat survived the fire, then <i>Castilleja chlorotica</i> can be expected to remain on the site. With the current stocking standards, no more than 40 percent canopy closure should occur. Therefore, habitat for <i>Castilleja chlorotica</i> will continue to exist. At this point, it will be assumed that Harvest Unit #172 has sagebrush habitat remaining. The fall before planting is scheduled to occur, trained botanical personnel will place pin flags at each clump of <i>Castilleja chlorotica</i> . This will allow the planters to avoid planting the trees directly on <i>Castilleja chlorotica</i> plants.	C, G, H
If <i>Eriogonum umbellatum</i> var <i>glaberrimum</i> is added to the R6 Sensitive Species Plant List, then surveys will be completed during the summer of 2003 to determine locations. If it is found to be within the Toolbox project boundaries, mitigations will be addressed at that time.	C, D, E, G, H
Should any listed endangered, threatened, or additional sensitive plant species be found within the project boundaries during any ground disturbing activity, all activities in these areas will be halted until their effects can be determined and their significance assessed.	C, D, E, G, H
<b>Objectives/Mitigation Measures &amp; Management Requirements</b>	<b><u>Alternatives</u></b>
<b>Prevent the spread/infestation of noxious weeds</b>	
The Invasive Plants Contract Provisions will be included into all contracts dealing with off-road equipment (harvest activities, road maintenance, road construction/decommissioning, etc.). This provision requires certification that off-road equipment is free of noxious weeds prior to the start up of operations. For more information, see the Noxious Weed section in Chapter 3.	C, D, E, G, H
If field surveys during the summer of 2003 reveal new noxious weed sites, building temporary roads through them will be prohibited until eradication of the site is achieved. Trained botanical personnel will assist with the temporary road layout to ensure the noxious weed site is excluded.	C, E, G, H
If field surveys during the summer of 2003 reveal new noxious weed sites within proposed harvest units, harvest activities should occur as early in the year as possible when the weeds are not in bloom or producing seed. Upon finding new noxious weed sites within proposed harvest units, trained botanical personnel will notify timber personnel of the discovery so appropriate action can be taken regarding proposed harvest activities	C, D, E, G, H
To ensure that landings and skid trails are not constructed on or through noxious weed sites, trained botanical personnel will provide the Sale Administrator with maps displaying the location of any known or newly discovered noxious weed sites in all units. During timber harvest no landings or skid trails are to be constructed on or through noxious weed sites, unless otherwise agreed to following consultation with the Botanist. Only one proposed salvage unit has a known site. Unit 131 (Alts. C,E,G,H) historically had Canada thistle. July 2003 monitoring indicates that it has been successfully eradicated through treatment.	C, D, E, G, H
Rock pits where material is used for road maintenance/construction containing known noxious weed sites will not be used. Currently, the three sites listed for use are noxious weed free. However, if future surveys reveal noxious weeds within these administrative areas, these sites will not be used unless otherwise agreed to following consultation with the Botanist.	C, D, E, G, H
Education/awareness is considered a central element of an overall prevention strategy. On-going training in noxious weed identification, early detection, reporting, mapping, and initial control will be continued. This has been an annual occurrence at the Silver Lake Ranger District since at least 1998. On July 29, 2003 a district-wide meeting continued this element of prevention with a presentation by the Forest Noxious Weed Coordinator and the District Botanist/Noxious Weed Coordinator, to all District employees, on noxious weed identification and prevention, including a focus on the fact that areas burned in 2002 were now prime habitat for invasive species.	A, C, D, E, G, H

**Range:**

**Non Forested Vegetation:**

Minimize loss of non-forested vegetation and ecosystem function.

Objective/Mitigation Measures and Management Requirements	Alternative
<p>The North Zone Range Management Specialist or the Forest Soil Scientist will be involved in marking reforestation units with the following legal descriptions. These legal descriptions identify areas that include sites considered non-forested vegetation types.</p> <p><b>T29 R13</b> Section 36 SE NE, SW NE, NE SE, SW SE, SW SW</p> <p><b>T29 R14</b> Section 31 SW SW</p> <p><b>T30 R13</b> Section 1 NE NE, NE NW, NW NW, SW NW Section 2 NE NE, SE NE, SW NE Section 12 NE NE, NW NE, SW NE Section 24 SE ME, SW SW, SE SW Section 35 NW NE, NE NE</p> <p><b>T30 R14</b> Section 6 NE NW, NW NW Section 24 NW NE, SW NE, NE NW, SE NW Section 26 SW NE, NW SE, NE SE, SW SE</p> <p><b>T30 R15</b> Section 8 SE SW, SW SE, SE SE Section 17 NE ¼, NW SE, NE SE Section 20 NW SE, NE SE, SW SE Section 21 S ½ Section 22 SW ¼ Section 27 NW NW, SW NW, NW SW Section 28 SE ¼, NE NW, SE NW, SW NW, NW SW, NE SW Section 33 NW ¼</p> <p><b>T30 R16</b> Section 15 NW SW, SW SW Section 20 SE SW Section 29 SE ¼, SW NE, SE NE</p> <p><b>T31 R13</b> Section 12 SW SW Section 14 NE NE</p> <p><b>T31 R14</b> Section 7 SW SW Section 8 NW SW Section 18 NW NW, NE NW</p> <p><b>T31 R15</b> Section 2 NW ¼, NE SE, SW SW, NE SW, NW SW Section 11 NW SW</p>	<p>C, D, E, G and H</p>

## **Scenery Resources:**

These mitigation measures are designed to assure compliance with scenic quality standards outlined in the Forest Plan for Management Areas 6A (Foreground Partial Retention) and MA-6B (Maximum Modification with special guidelines).

<b>Mitigation</b>	<b>Unit Numbers</b>	<b>Alternative</b>
Landings may be located in the foreground-viewing zone, but toward the back of the zone as much as terrain and existing road locations allow.	26, 27, 139, 141, 148, 149, 150, 155, 161, 162, 163, 168, 181, 185, 190, 191, 192, 193, 194, 195, 204, 212, 213, 214, 215, 217, 223, 224, 236, 237	C, G, H
	All of the above except 185, 195, 204, 223, 224	D
	All of the above except 192, 194, 195, 204, 223	E
Units within MA-6A and MA-6B should utilize snag clumps to break up appearance. The clumps will be selected to insure that they are far enough from the road so as not to constitute a safety or maintenance problem.	26, 27, 139, 141, 148, 149, 150, 155, 161, 162, 163, 168, 181, 185, 190, 191, 192, 193, 194, 195, 204, 212, 213, 214, 215, 217, 223, 224, 236, 237	C, G, H
	All of the above except 185, 195, 204, 223, 224	D
	All of the above except 192, 194, 195, 204, 223	E
For units adjacent to MA-6A and MA-6B, logs should be yarded away from roads where possible, except for roadside hazard units within RHCAs.	26, 27, 139, 141, 148, 149, 150, 155, 161, 162, 163, 168, 181, 185, 190, 191, 192, 193, 194, 195, 204, 212, 213, 214, 215, 217, 223, 224, 236, 237	C, G, H
	All of the above except 185, 195, 204, 223, 224	D
	All of the above except 192, 194, 195, 204, 223	E
Slash piles should be located outside of MA-6A and MA-6B as much as possible and should be high priority for burning.	26, 27, 139, 141, 148, 149, 150, 155, 161, 162, 163, 168, 181, 185, 190, 191, 192, 193, 194, 195, 204, 212, 213, 214, 215, 217, 223, 224, 236, 237	C, G, H
	All of the above except 185, 195, 204, 223, 224	D
	All of the above except 192, 194, 195, 204, 223	E

**Objective:** To assure meeting Forest Plan scenic quality objectives during and following implementation.

**Effectiveness:** Locating landings toward the back of the foreground viewing zone as much as existing terrain allows, will minimize visual impacts from scenic corridors. Retaining snag clumps (where they do not pose a safety hazard) in roadside hazard treatment corridors breaks up the potentially objectionable “look” of long stretches of treeless landscape in the frontage zone along scenic corridors. Yarding logs away from scenic corridors will minimize the visibility of harvest activity from scenic corridors. Locating slash piles outside of MA-6A and MA-6B will minimize the visibility of harvest from scenic corridors.

**Smoke Management:**

<b>Reduce smoke intrusion</b>	<b>Alternatives</b>
All smoke producing operations associated with prescribed fire or activity fuels reduction will comply with the provisions of the State Implementation Plan.	Alts C, D, E, G, H / all units where prescribed fire or other burning is used

**Cultural Resources:**

<b>Objectives/Mitigation Measures and Management Requirements</b>	<b>Alternatives</b>
<b>Protect Significant Cultural Resources During Commercial Timber Salvage Activities</b>	
All significant cultural sites within or adjacent to any unit will be identified on the ground by North Zone Heritage personnel. No harvest of timber within cultural resource sites will be allowed. Trees adjacent to the site will be directionally felled away from the site location. Generally, no skidding will be allowed within cultural resource sites, except upon existing roads. Access to units through cultural resource sites upon existing classified or unclassified roads will be allowed.	C, D, E, G, H
There may be a few locations where skidding from a unit to an adjacent road may require skidding through a cultural resource site. Where there are well-established skid trails or old temporary roadbeds these may be used to skid the timber to the road. The Timber Sale Administrator will confer with the North Zone or Forest Archaeologist or Cultural Resource Technician for concurrence prior to authorizing the use of any skid trail through identified sites.	C, D, E, G, H
All temporary roads needed to access proposed units in all alternatives have been surveyed, and have been relocated, where needed, to protect significant cultural resource sites.	C, D, E, G, H
The beds of historic road routes will not be utilized as haul routes, or skid roads. These roads have been identified from historic maps and records, and are considered potentially eligible to the National Register of Historic Places. Heritage resource personnel will provide a map of these roads to the Sale Administrator. They will be protected from any activities during salvage operations.	C, D, E, G, H
Where changes in temporary road location are needed during implementation of the activity, the Sale Administrator will coordinate with the North zone or Forest Archaeologist or Cultural Resource Technician who will determine if additional inventory is necessary. The North Zone Heritage personnel or other qualified personnel will conduct an inventory of the proposed road route change, if needed. The North zone or Forest Archaeologist or Cultural Resource Technician will be coordinated with regarding any relocation prior to ground disturbing activity, and document such inventory and newly recorded sites to the Forest Archaeologist and Oregon SHPO.	C, E, G, H
Cultural Resource sites will be avoided during placement of Helicopter logging landings. The locations of these landings have been surveyed in 2002. If additional helicopter landings are needed, the Sale Administrator will coordinate with the North Zone or Forest Archaeologist or Cultural Resource Technician for agreement prior to use.	C, D, E, G
The Heritage Department will be notified by the Sale Administrator if a need for skid trails, temporary roads or landings outside of proposed units is discovered during the timber salvage operation. The North Zone or Forest Archaeologist or Cultural Resource Technician will be consulted before these locations are agreed to, prior to any ground-disturbing activity.	C, D, E, G, H
If sites are discovered during on-the-ground preparation of sale units or at any time prior to the ground disturbing activity, the North Zone Heritage department will be notified. The site will be reviewed on the ground by the North Zone or Forest Archaeologist or Cultural Resource Technician, who will develop protection measures, if needed. Once this review has been undertaken, and resources protected, project activity can proceed.	C, D, E, G, H

**Cultural Resources (continued):**

<b>Objectives/Mitigation Measures and Management Requirements</b>	<b>Alternatives</b>
If a site is discovered during harvest or any ground disturbing activity, all work will cease in the vicinity of the discovery. At that time, the North Zone Heritage department will be notified, and the location will be reviewed on the ground. The North Zone or Forest Archaeologist or Cultural Resource Technician will develop protection measures for these sites, if needed. Once this review has been undertaken, and resources protected, project activity can proceed.	C, E, G, H
Road reconstruction will avoid impacts to significant cultural resource sites. Where sites extend across the areas to be improved, the roadbeds will not be enlarged, or shaped, unless otherwise agreed to following consultation with the North Zone or Forest Archaeologist or Cultural Resource Technician. Cinders or other surfacing may be placed ovetop of the disturbed site within the roadbed. Road reconstruction will not be undertaken where the road in question is a historic road route.	C, D, E, G, H
<b>Protect Significant Cultural Resources During Post-Salvage, Site Preparation and Planting Activities</b>	
If a site is discovered during post harvest ground disturbing activity, or other rehabilitation activity (slash piling, site scarification, planting), all work will cease in the vicinity of the discovery. At that time, the North Zone Heritage department will be notified, and the location will be reviewed on the ground. The North Zone or Forest Archaeologist or Cultural Resource Technician will develop protection measures and or mitigations for these sites, if needed. Once this review has been undertaken, and resources protected, project activity can proceed.	C, D, E, G, H
Slash piles will not be located immediately adjacent to un-piled slash within cultural resource sites if they are scheduled for burning. They will be located at a distance that would reasonably prevent the spread of fire into the cultural resource site during pile burning.	C, D, E, G, H
Hazard trees within significant cultural resource sites may be felled to protect the public. Such trees may be removed by hand as firewood, or other small products that could be carried to vehicles.	C, D, E, G, H
Significant cultural resource sites will be avoided during potentially ground disturbing slash treatment of plantation thinning. Sites may be avoided during thinning, leaving a thicker patch of trees on the site, or may be thinned with no slash treatment leaving heavier fuels on the site. Hand piling of slash from within the site to areas outside the site boundary may also be undertaken on cultural resource sites.	C, D, G, H
Significant cultural resource sites will be avoided during site preparation for reforestation. Sites will be left untreated unless specific circumstances dictate that fuels must be treated in order to protect public safety, or for very significant needs of other resource areas. Such situations will be rare. Such treatments will not be ground disturbing (hand piling, lop and scatter, etc.). The North Zone or Forest Archaeologist or Cultural Resource Technician will approve such treatment prior to implementation.	C, D, G, H
Significant cultural resource sites within existing plantations will not be re-planted using mechanized systems. The North Zone or Forest Archaeologist or Cultural Resource Technician on a site-by-site basis may approve hand planting using spade, "hodad", or planting bar. Scalping of the ground will not be undertaken at such planting locations. Trees will be planted at 20 by 20 foot spacing to prevent the need for future thinning and slash disposal on these sites.	C, D, G, H
Known or discovered historic peeled trees (dead or alive) will be protected during fuel treatment activities.	C, D, E, G, H
<b>Protect Significant Cultural Resources During Prescribed Fire and Fuel Reduction Activities</b>	
Significant sites will be avoided during prescribed fire activities (underburning, jackpot burning, pile burning). Lithic scatters and historic sites are adversely impacted by fire. Although the 2002 wildfires have burned over many of these sites, the impacts are cumulative, resulting in further degradation of the surface expression and features of these sites. Tree carvings are particularly susceptible to fire damage. Fuel reduction near sites should include measures to ensure the sites are not re-burned.	C, D, G, H
All significant sites will be avoided during construction of fire lines for prescribed fire.	C, D, G, H
Existing woody fuels within sites will not be piled using ground-disturbing methods if such activity will damage these sites. Hand piling would be allowed, but piles placed within sites will not be burned.	C, D, E, G, H

## **Cultural Resources (continued):**

<b>Objectives/Mitigation Measures and Management Requirements</b>	<b>Alternatives</b>
Dead trees standing and down that are within significant cultural resources may be hand carried off site for firewood, or other uses to vehicles located on existing roads, or piled out side the site boundaries. These activities will be coordinated with the North Zone or Forest Archaeologist or Cultural Resource Technician.	C, D, E, G, H
In areas where high fuel loadings and high fire hazard exist within significant cultural resource sites, those fuels may be hand piled to break up continuous fuel beds, and/or removed by vehicle from roadsides within the sites. These hand piles will not be burned. These activities will be coordinated with the North Zone or Forest Archaeologist or Cultural Resource Technician.	C, D, E, G, H
<b>Protect Significant Cultural Resources During Road Management Activities</b>	
If an existing unclassified road or skid trail (through a significant cultural resource site, as discussed in the Timber Salvage Activity section above) is used, the road or skid trail bed will not be scarified, blocked with an earth berm, or otherwise obliterated with ground disturbing methods within the site boundary. Closures using log, brush, or slash to block or disguise the road will be utilized if needed.	C, D, E, G, H
Other closures of roads that pass through significant cultural resource sites will avoid ripping, berm construction or other ground disturbance within the boundaries of the sites. The roads may be obliterated or closed on either side of these sites, however. Closures using log, brush, or slash to block or disguise the road will be utilized if needed.	C, D, E, G, H
The beds of historic road routes will not be obliterated, though they may be closed at intersections with modern roads, or areas that have been obliterated by other activities in the past. These closure locations will be identified and or approved by the North Zone or Forest Archaeologist or Cultural Resource Technician.	C, D, E, G, H
<b>Protect Significant Cultural Resources Soil and Riparian Protection and Restoration Projects</b>	
Aspen thinning will avoid any historic aspen arborglyph trees. Any trees with writing on them will be avoided until they can be reviewed by the North Zone Heritage Department.	C, D, G, H
Aspen arborglyph sites with surviving arborglyph trees may have fuels piled and burned, as long as such activity does not impact the arborglyphs or the health of the surviving aspen on which the arborglyph lies.	C, D, G, H
Aspen arborglyph sites that have had all historic arborglyphs destroyed by the 2002 fires will no longer be managed as cultural resource sites. These sites may be harvested of salvageable timber, and replanted to aspen. Inspection and determination of the impacts to these sites will take place in summer of 2003.	All alternatives
Significant cultural resource sites that are susceptible to ground disturbance will be avoided during aspen and willow plantings. Planting may occur in aspen arborglyph sites with approval of the North Zone or Forest Archaeologist or Cultural Resource Technician. Generally, most other cultural resource sites lie outside the potential project impact zones of aspen and willow planting.	C, D, G, H
Road 2917431 improvement location will be surveyed in 2003. Any sites located at the project area will be avoided, or further mitigation will be required. Such mitigations will be developed by the North Zone or Forest Archaeologist or Cultural Resource Technician in conjunction with the Forest Archaeologist and approved under the auspices of the State Historic Preservation Officer.	C, D, G, H
One carving of initials and a date on a ponderosa pine was previously located along the West Fork of Silver Creek. The fire has destroyed the tree carving and will no longer be managed as a site. This is not within any proposed harvest units. It is within a RHCA.	All alternatives

## **Monitoring**

A monitoring plan is provided in Appendix D. This monitoring is incorporated as an integral feature of Alternatives C, D, E, G, and H.

## Alternatives and Design Elements Considered But Not Fully Analyzed

During initial public scoping and initial alternative development, several suggested alternatives were considered for detailed study. The following section describes these alternative concepts and the reasons they are not given detailed study.

**Alternative B (Proposed Action)** - During alternative development, Alternative B was the title given to the originally scoped proposed action. The proposed action released for public scoping in November 2002 included a variety of projects, including an estimated 21,500 acres of salvage harvest in the Silver Creek, Silver Lake, and Summer Lake Watersheds. Maps distributed with the proposed action displayed specific areas proposed for salvage activity. Field reconnaissance, begun in August 2002 and completed in January 2003, coupled with preliminary feasibility assessments of resource protection needs, determined a need to spatially adjust the salvage proposals, typically by reducing their size or shifting their location, in order to provide specific resource protections or to achieve compliance with Forest Plan Standards and Guidelines. In addition to these adjustments, the initial proposal included a very small portion of the Ana River Subwatershed of the Summer Lake Watershed within its project area boundary. While the Toolbox Fire Complex was burning, a large, high-intensity fire known as the Winter Fire was burning in the Summer Lake Watershed, immediately to the east. In some phases of the analysis of a large project such as this, the effects over entire subwatersheds or watersheds require consideration. To assist in efficiency of analysis, it was decided to not include the small portion of the Toolbox Fire within the Ana River Subwatershed within the Toolbox Fire Recovery Project area. The result of this adjustment is that no area within the Summer Lake watershed is included in this project. Because of these two adjustment factors, it was decided that it was better to not fully develop and analyze the original proposed action, but rather start “clean” with an alternative (Alternative C) that maintained the theme of the initial proposal, but responded to these needed adjustments.

**Alternative F (Restoration-only/Passive Approach)** - A no-commercial logging alternative emphasizing a passive approach to restoration based on “Beschta Report” recommendations was suggested in a scoping response. During alternative development, Alternative F was the working title given to such an alternative. Its conceptual parameters included none, or a very limited amount of salvage (salvage only hazardous trees adjacent to main Forest roads), small diameter fuels treatment only in areas where subsequent fuel loadings would present the very highest risk of subsequent high intensity wildfire, prescribed fire limited to areas where no pre-treatment would be required, planting of ponderosa pine seedlings limited to those areas where the minimal amount of salvage triggered the requirement to reforest, no plantation thinning, and a full array of road decommissioning and other soil and water protection and restoration projects.

This alternative was considered, but not developed as a complete entity because it would not meet purpose and need in regard to reducing future surface fuel loading, developing a long term sustainable forest that is maintainable by re-introduction of fire, or recovery of merchantable value. Since it is primarily the commercial aspects of the proposed recovery action that were emphasized in the public comment, it’s worth noting the range of commercial activity that is included in the alternatives. There are approximately 28,000 acres in the project area that could be characterized as burned commercial forestland, that contain a commercial component. Using this as a basis, Alternative C proposes commercial activity on about 52% of these acres, followed in ascending order by Alternative G (51.5%), Alternative H (46.5%), Alternative E (41%), Alternative D (23%) and Alternative A (0%). The other alternative considered, but not fully analyzed (Alternative B) included proposals for commercial activity on about 77% of the burned area with a commercial harvest component. Since the Beschta recommendations largely rely upon a passive approach to restoration, consideration of Alternative A provides an analysis of some of the components of this approach. The range of activity included in the fully developed action alternatives, combined with consideration of the effects of the no-action alternative, offer a sufficient display of trade-off and variation of effect to explore the issue embodied in the question of success of recovery through active management vs. recovery through a limited (or even non-) intervention approach.

One of the most important factors for future development of LOS is the use of prescribed fire. As disclosed in Chapter 3, in the Forested Vegetation and Fire/Fuels sections, a scenario in which future fuel loadings are not significantly reduced through salvage removal and follow-up fuels treatment, and in which planting doesn’t occur (such as in Alternative A) would lead to an estimated 20,000 non-forested acres that would normally (if consistent with historic range of variability) support forested vegetative communities. Instead these areas would develop vigorous shrub-grass vegetation because of a lack of seed trees. Re-establishment of conifer seedlings, except in very small localized pockets, would take 30-75 or more years. Development of LOS structure (if there were an absence of stand-replacing wildfire) could take up to 300 years across many areas, due to the lag time in re-establishing conifers and the solid establishment of competing vegetation. About 20-30% of the area could develop LOS structure in 150-200 years. This LOS structure would be multi-storied and not a stable, sustainable stand. Because no fuels reduction would occur, it would eliminate the use of prescribed fire

without very expensive mechanical pretreatments. It would also create a fuelbed that would, in the event of a fire start, support the spread of intense, stand-replacement wildfires.

Alternatives C, D, G, and H include a full array of restoration activities, including road decommissioning and other soil, water and wildlife enhancement projects.

Specific major recommendations of the Beschta Report are:

*Salvage logging should be prohibited in sensitive areas* (including): severely burned areas, on erosive sites, on fragile soils, in roadless areas, in riparian areas, on steep slopes, and on any site where accelerated erosion is possible and *Prohibit yarding systems that rely on tractors and skidders* - The primary factors considered in the determination to not apply the broad-brush Beschta recommendations on this topic, were site-specific terrain and soils factors and the incorporation into all action alternatives of the Fremont National Forest Soil Productivity guidelines, including guidelines on their use of low ground pressure equipment (see Appendix C – Mitigation Details; Fremont National Forest Soil Productivity Guide).

The terrain within the fire perimeter is almost universally of gentle slope. About 86 percent of the fire area has slopes under 15 percent. Only about 3 percent of the fire area has slopes over 30 percent. Ground-based systems are generally acceptable on slopes of less than 35 percent sideslope. Helicopter logging is particularly sensitive to economic factors. If site-specific factors determined a portion of the project area was unsuitable for ground-based yarding systems, and an economically viable commercial salvage opportunity was identified, helicopter yarding was then considered as an option by the IDT during alternative design. The action alternatives range from a high of 6 percent of the proposed salvage acres being helicopter yarding (Alternative D) to zero percent (Alternative H).

Existing condition compaction monitoring within the area (post-fire) included 1820 sample points on 91 transect locations on proposed salvage areas were used to estimate soil conditions. Compaction surveys sampled a wide range of soil map units, including areas within the Toolbox Complex that burned in 1996 (Alder Fire) and were subsequently salvage harvested (Alder Ridge Timber Sale, 1997). As a whole, 1 percent of the samples had detrimental soil conditions. No transect or proposed harvest area had detrimental soil compaction using the regional guidelines for detrimental soils (Forest Service, 1998). The area exhibits a low amount of adverse compaction. No transect within any subwatershed was found to have high compaction and therefore each subwatershed was rated as currently functioning appropriately, for this parameter. See Chapter 3, Geology, Geomorphology and Soils, and Watershed for further discussion of this topic.

Consideration of the resources related to the other Beschta Report recommendations included above (under ‘sensitive areas’) is included in Chapter 3 sections on: “Watershed” and “Inventoried Roadless and Unroaded”.

*Active reseeding and replanting should be conducted only under limited conditions* – There is no seeding proposed in the project. The Interdisciplinary Team Silviculturist determined that not planting conifer seedlings in a timely manner, and not implementing substantial fuel reduction, particularly in the abundant 51% to 100% mortality areas would lead to little conifer stocking within an area that would then be characterized by an abundant shrub component and a heavy fuel bed. This would not meet purpose and need pertaining to the long-term development of sustainable forest conditions. See the Forested Vegetation section in Chapter 3 for a full discussion.

*Leave 50 percent of the standing dead trees* – Leaving standing dead trees was central to both the stated purpose and need and to a specific key issue. For this reason the planning considered the need to leave standing dead trees from the beginning. The Beschta Report recommendation does not include specific rationale as to why the “50 percent” level was selected. In the site-specific planning for this project, the snag retention strategies included in the action alternatives are the product of guidance contained in existing land management planning frameworks (Fremont LRMP, as amended) and a site-specific application of current scientific documentation. Specifically, “DecAid” (or the “Decayed Wood Advisor for Managing Snags, Partially Dead Trees, and Down Wood for Biodiversity in Washington and Oregon” (Mellen, 2002), was used as the basis for the effects analysis on snag and down wood-dependent species. Post-fire field reconnaissance identified areas of optimal habitat for snag and down wood dependent species, including consideration for species that generally favor large snags (Lewis’ woodpecker) and those that favor smaller snags (black-backed woodpecker). The alternatives were designed to respond in a varying manner to habitat for snag and down wood dependent species, by focusing on these areas of optimal habitat, as well as incorporating, site-specific within-harvest-unit snag retention guidelines for all proposed harvest units. See the Wildlife section of Chapter 3 for a full discussion of this topic. Alternative A would retain 100 percent of the standing dead trees.

*Determine the need to undertake road maintenance, improvement or obliteration* - This is essentially incorporated into all action alternatives. A six-step road analysis process was used to develop recommendations, for each road, that ranged from

leaving the road open at its current maintenance level, increasing the maintenance level, closing the road, or decommissioning the road. These recommendations were then incorporated into the alternatives as road-specific proposals. See Appendix E for a complete listing, by road, by alternative, of proposed road management actions.

**Design Elements** – The Mitigation and Resource Protection Measures previously listed display those features that were adopted as integral portions of all or some, of the action alternatives. In addition, resource protections measures or mitigations were identified and considered as a means to lessen or eliminate several identified and expected adverse effects on specific resources. For the reasons stated in the table below, these measures were not adopted.

**Table 2.11 Mitigations Considered, But Not Adopted**

<b>RESOURCE</b>	<b>Alt.(s)</b>	<b>Adverse Effect Not Covered by Mitigation</b>	<b>Measure or design element considered to mitigate adverse effect</b>	<b>Why mitigation measure or design element was not applied</b>
Forested Vegetation	C,D,E, G,H	1,000 (or less) acres of site preparation would likely occur during the first growing season and could negatively affect some of the first year germinants.	No site prep during the first growing season	Measure would be counter to purpose and need to develop a long-term sustainable forest.
Wildlife: mule deer elk	C, G	Further loss of cover on mule deer habitat due to prescribed fire	No prescribed burning in existing cover stands	Measure would be counter to the purpose and need of developing a long-term sustainable forest.
Wildlife: mule deer elk	C,D,E, G,H	Delayed response of forage including bitterbrush due to salvage harvest	No salvage harvest	Measure would be counter to the purpose and need to salvage timber for merchantable value.
Wildlife: all birds (other than those species for which mitigations have been designed (bald eagle, peregrine falcon, and raptors)	C,D,E, G,H	Direct effect of salvage activity on nesting	No salvage harvest from April 1 – August 1	Harvest activity is expected to take place in only one year at each specific location and the effects would be short-term. Although short-term effects could have been entirely avoided, the design of this project still provides substantial areas of habitat where no (even short-term) disturbance would occur. In the long-term, sufficient habitat within harvest and no-harvest areas would provide for viable populations.  Measure would be counter to the purpose and need to salvage timber for merchantable value.

**Table 2.11 Mitigations Considered, But Not Adopted (continued)**

RESOURCE	Alt.(s)	Adverse Effect Not Covered by Mitigation	Measure or design element considered to mitigate adverse effect	Why mitigation measure or design element was not applied
Wildlife: pine marten pacific fisher	C,D,E, G,H	Loss of down wood due to salvage and fuels treatments	No salvage harvest or fuels treatments	<p>No documented sightings of pacific fisher; nearest habitat is 3 miles west in Yamsay Semi-Primitive area.</p> <p>Reducing fuel loadings would protect pine marten habitat that remains following activity. Planting and fuel treatments would promote the long-term development of habitat. Retention of 10 to 30 percent of slash plies would provide habitat.</p> <p>Measure would be counter to the purpose and needs to reduce future fuel loadings, reduce insect infestation, develop long-term sustainable forests, and to salvage timber for merchantable value.</p>
Wildlife: Northern leopard frog and Northwestern pond turtle	C,D,E, G,H	Direct effect of instream down wood placement and salvage harvest in riparian areas to individuals or habitat	No salvage harvest or instream down wood placement in riparian areas	<p>No documented sightings of either species on the Silver Lake Ranger District. Actions are not likely to result in a trend toward federal listing or loss viability.</p> <p>Measure would be counter to purpose and needs to restore riparian areas damaged by the Toolbox Fire Complex and to salvage timber for merchantable value.</p>
Fisheries	C,D,E, G,H	Short-term impacts on redband trout spawning and rearing habitat caused by insignificant short-term sediment inputs produced by the action alternatives, combined pre-existing sediment sources.	No salvage harvest (although even with Alternative A, minor short-term changes in aquatic habitat are expected due to pre-existing sediment sources)	Attainment of INFISH RMOs is not jeopardized. Short-term increases would be in significant. In the long-term, the pool frequency RMO would be maintained or improved as natural riparian vegetative recovery occurs and larger scale sediment reductions occur from improvements to the road network. Actions would not likely contribute to a trend toward federal listing or loss of viability to the population or species (though the may impact individuals or habitat).
Recreation	C,D,E, G,H	Project-related temporary closures of trails, roads, and active salvage areas would impact hiking, skiing, snowmobiling, mushroom picking, firewood gathering, camping, fishing, and seasonal hunting in the short term.	No salvage harvest.	Measure would be counter to purpose and needs to salvage timber for merchantable value and reduce future fuel loadings. Impacts would be short term.

**Table 2.11 Mitigations Considered, But Not Adopted (continued)**

<b>RESOURCE</b>	<b>Alt.(s)</b>	<b>Adverse Effect Not Covered by Mitigation</b>	<b>Measure or design element considered to mitigate adverse effect</b>	<b>Why mitigation measure or design element was not applied</b>
Recreation	C, D, E, G	Helicopter use would generate noise that could be heard away from the local sale area.	Eliminate all helicopter harvest units.	Measure would be counter to purpose and needs to salvage timber for merchantable value and reduce future surface fuel loadings. Impacts would be short term.
Recreation	C,D,E, G,H	Road decommissioning and closures would decrease opportunities for road hunting.	Do not close or decommission roads within the project area	Measure would be counter to the purpose and need to restore damaged riparian areas. Measure would be counter to Forest Plan direction regarding desired road densities.
Scenery	C	Short-term visibility of landings from scenic corridor	Do not locate landings where any portion may be visible from scenic corridor	Impacts would be short term and mitigation measure would not respond to Forest Plan direction to provide economical timber sales.
Scenery	C,D,E, G,H	Thinning slash would be visible from scenic corridor	Do not locate thinning units where any portion may be visible from a scenic corridor	Measure would be counter to purpose and need to develop a long-term sustainable forest. Visual impacts would be short term because juvenile wood decays quickly.
Social and Environmental Justice	C,D,E, G,H	Some minorities, low-income residents, and Native Americans may be impacted by the alternatives with lesser amounts of salvage, if the groups are economically tied to that industry.		These effects would be localized, are not measurable, and would not be disproportionate to low income or minority groups
Social and Environmental Justice	C,D,E, G,H	Due to road closure/decommissioning, vehicle access year-around would decrease for uses such as hunting and firewood cutting.	Do not close or decommission roads within the project area	Measure would be counter to the purpose and need to restore damaged riparian areas. Measure would be counter to Forest Plan direction regarding desired road densities.
Treaty Rights	D; to a lesser extent: E, G, H	The proposal would reduce opportunities for members of the Klamath Tribes to hunt or gather Treaty Right resources within former Klamath Reservation boundaries, using motorized vehicles.	Do not close or decommission roads within former Klamath Reservation boundaries.	Measure would be counter to the purpose and need to restore damaged riparian areas. Measure would be counter to Forest Plan direction regarding desired road densities. This design was applied to Alternative C; and Alternatives E, G and H include design that partially responds.

**Table 2.11 Mitigations Considered, But Not Adopted (continued)**

<b>RESOURCE</b>	<b>Alt.(s)</b>	<b>Adverse Effect Not Covered by Mitigation</b>	<b>Measure or design element considered to mitigate adverse effect</b>	<b>Why mitigation measure or design element was not applied</b>
Unroaded Area (non-inventoried)	All Alts	Apparent naturalness would be decreased by harvesting timber on a total of approximately 970 acres within five non-inventoried unroaded areas. Stumps would be visible.	No harvest within the 970 acres of non-inventoried unroaded areas.	Measure would be counter to purpose and needs to salvage burned timber for merchantable value and reduce future surface fuel loadings.
Unroaded Area (non-inventoried)	All Alts	Unroaded recreation opportunities would be somewhat diminished in the short term.	No temporary road construction within the 970 acres of non-inventoried unroaded areas.	Measure would be counter to purpose and needs to salvage burned timber for merchantable value and reduce future surface fuel loadings.
Unroaded Area (non-inventoried)	All Alts	Short-term interruption in solitude associated with logging operations.	No harvest within the 970 acres of non-inventoried unroaded areas.	Measure would be counter to purpose and needs to salvage burned timber for merchantable value and reduce future surface fuel loadings. Impact would be short term.

## Comparison of Alternatives

This section presents several tables that summarize and compare the alternatives by: response to purpose and need; response to key issues; activities considered and effects in regard to key issues. For more detail, refer to Chapter 3.

Table 2.12 and Table 2.13 compare the alternatives based on how they respond to purpose and need for action and how they respond to the key issues.

**Table 2.12 Comparison of Alternatives Based on How They Respond to the Purpose and Need for Action**

Purpose/ Need → Alt ↓	Maintain habitat created or recover habitat lost as a result of the fire	Reduce future surface fuel loading in order to influence subsequent fire behavior and effects	Restore riparian areas
<b>Alternative A (No Action)</b>	Partially addresses P/N. Retains 2,689 of 2,689 acres identified as optimal snag and down wood-dependent species habitat. Retains mule deer cover. Allows passive recovery of other habitats. Does not reduce the fuels that would contribute to subsequent high intensity wildfire.	Does not address P/N	Partially address P/N No watershed or riparian improvement activities. Allows passive recovery of riparian areas
<b>Alternative C</b>	Partially addresses P/N. Retains 2,303 of 2,689 acres identified as optimal snag and down wood-dependent species habitat. Reduction of mule deer cover requiring site-specific Forest Plan amendment.	Addresses P/N. Accounting for fuels reduction within salvage units and prescribed fire (primarily outside salvage units) reduces fuels beyond whole tree yarding (WTY) or yard-tops-attached (YTA) on approximately 13,600 acres	Addresses P/N Includes an array of watershed and riparian improvement activities. Includes design elements to protect riparian areas in compliance with INFISH.
<b>Alternative D</b>	Addresses P/N Retains 2,482 of 2,689 acres identified as optimal snag and down wood-dependent species habitat. Retains mule deer cover.	Partially addresses P/N. Accounting for fuels reduction within salvage units and prescribed fire, reduces fuels beyond WTY or YTA on approximately 8,000 acres	Addresses P/N. Includes an array of watershed and riparian improvement activities. Includes design elements to protect riparian areas in compliance with INFISH. Has the least amount of upland disturbance of any action alternative
<b>Alternative E</b>	Addresses P/N Retains 2,348 of 2,689 acres identified as optimal snag and down wood-dependent species habitat. Retains mule deer cover.	Partially addresses P/N. Accounting for fuels reduction within salvage units, reduces fuels beyond WTY or YTA on approximately 6,600 acres	Partially addresses P/N Includes some watershed and riparian improvement activities. Includes design elements to protect riparian areas in compliance with INFISH.
<b>Alternative G</b>	Partially addresses P/N Retains 1,902 of 2,689 acres identified as optimal snag and down wood-dependent species habitat. Reduction of mule deer cover requiring site-specific Forest Plan amendment.	Addresses P/N. Accounting for fuels reduction within salvage units and prescribed fire, reduces fuels beyond WTY or YTA on approximately 20,500 acres.	Addresses P/N Includes an array of watershed and riparian improvement activities. Includes design elements to protect riparian areas in compliance with INFISH.
<b>Alternative H</b>	Addresses P/N Retains 2,484 of 2,689 acres identified as optimal snag and down wood-dependent species habitat. Retains mule deer cover.	Addresses P/N. Accounting for fuels reduction within salvage units and prescribed fire, reduces fuels beyond WTY or YTA on approximately 11,500 acres	Addresses P/N Includes an array of watershed and riparian improvement activities. Includes design elements to protect riparian areas in compliance with INFISH.

**Table 2.12 Comparison of Alternatives Based on How They Respond to the Purpose and Need for Action (continued)**

<b>Purpose and Need</b> Alt. ↓ ↘ →	Reduce insect infestation by removing breeding habitat for bark beetles	Develop a long-term sustainable forest that is maintainable by re-introduction of fire	Salvage burned timber for merchantable value
<b>Alternative A (No Action)</b>	Does not address P/N Leaves all dead material including newly available beetle habitat that is created by the progression of tree mortality. Does not thin residual green stands	Does not address P/N Does not include reforestation or fuels reduction. Relying on natural regeneration to begin the recovery process, and the recovery to then proceed to a sustainable condition in setting with fuel loadings that well-exceed historic range, does not meet P/N.	Does not address P/N Salvages no timber. Recovers no value.
<b>Alternative C</b>	Partially addresses P/N Reduces the amount of dead material including newly available beetle habitat that is created by the progression of tree mortality. Does not thin residual green stands.	Addresses P/N. Conifer planting on approximately 20,800 acres (net). Fuels reduction beyond whole tree yarding or yard-tops-attached on 71% of 14,441 salvage acres, plus prescribed fire on 3,572 acres.	Addresses P/N Salvages an estimated 73.3 mmbf of timber
<b>Alternative D</b>	Partially addresses P/N Reduces the amount of dead material including newly available beetle habitat that is created by the progression of tree mortality. Does not thin residual green stands.	Partially addresses P/N. Conifer planting on approximately 20,800 acres (net). Fuels reduction beyond whole tree yarding or yard-tops-attached on 89% of 6,367 salvage acres, plus prescribed fire on 2,450 acres.	Partially addresses P/N Salvages an estimated 37.3 mmbf of timber
<b>Alternative E</b>	Partially addresses P/N Reduces the amount of dead material including newly available beetle habitat that is created by the progression of tree mortality. Does not thin residual green stands.	Partially addresses P/N. Conifer planting on approximately 20,800 acres (net). Fuels reduction beyond whole tree yarding or yard-tops-attached on 59% of 11,490 salvage acres. No prescribed fire.	Addresses P/N Salvages an estimated 66.1 mmbf of timber. Focuses on areas with the highest economic return
<b>Alternative G</b>	Partially addresses P/N Reduces the amount of dead material including newly available beetle habitat that is created by the progression of tree mortality. Does not thin residual green stands.	Addresses P/N to the greatest extent of any alternative. Conifer planting on approximately 20,800 acres (net). Fuels reduction beyond whole tree yarding or yard-tops-attached on 11,354 acres 79% of 14,419 salvage acres, plus fuels reduction on 5,596 acres outside of salvage units, within ¼ mile of private land boundary, plus prescribed fire on 3,572 acres. The 5,596 acres outside of salvage units, and 1,132 acres within salvage units (within ¼ mile of private land boundary) are not included in other action alternatives.	Addresses P/N Salvages an estimated 73.2 mmbf of timber
<b>Alternative H</b>	Partially addresses P/N Reduces the amount of dead material including newly available beetle habitat that is created by the progression of tree mortality. Does not thin residual green stands.	Partially addresses P/N. Conifer planting on approximately 20,800 acres (net). Fuels reduction beyond whole tree yarding or yard-tops-attached on 70% of 13,031 salvage acres, plus prescribed fire on 2,450 acres.	Addresses P/N Salvages an estimated 63.8 mmbf of timber.

Table 2.13 Comparison of Alternatives based on how they respond to the Key Issues

<p style="text-align: center;">Issue →</p> <p style="text-align: center;">Alt. ↓</p>	<p style="text-align: center;"><b>Issue:</b> <b>Changes in Motorized Access</b></p>	<p style="text-align: center;"><b>Issue:</b> <b>Economic Efficiency and Economic Opportunities</b></p>
<p><b>Alternative A (No Action)</b></p>	<p>No change to existing motorized access</p>	<p>No project activity. No additional costs or benefits proposed. No economic opportunity presented.</p>
<p><b>Alternative C</b></p>	<p>Issue is based on concerns about motorized access changes included in Alternative B (the original proposed action). Alternative B did not specifically speak to motorized access within former Klamath Indian Reservation boundaries. This alternative retains such access.</p>	<p>Issue is based on desire to provide more value or less cost than included in Alternative B (the original proposed action) and a concern that the supply of raw materials for wood products and job support appeared to be a “reluctant inclusion” of the original proposed action. This alternative does not address these concerns differently than the original proposed action, but due to a lesser amount of salvage (due to factors discussed earlier in this chapter), presents less opportunity than the original proposed action.</p>
<p><b>Alternative D</b></p>	<p>Does not address motorized access concerns. Reductions in motorized access based entirely on watershed and habitat considerations</p>	<p>This alternative, due to a lesser amount of salvage, presents less opportunity than the original proposed action.</p>
<p><b>Alternative E</b></p>	<p>Designed, in part, to address this issue. Reductions in motorized access in the project area as a whole only to the point of achieving Forest Plan maximum road densities. Retains motorized access within former Klamath Indian Reservation boundaries, except roads specifically recommended for decommissioning to achieve resource protection.</p>	<p>This alternative, due to a lesser amount of salvage, presents less opportunity than the original proposed action. However, within that scope it was designed to address this issue on the efficiency side. It focuses salvage on areas with highest return. Includes less fuels reduction within salvage units, no prescribed burning outside salvage areas, no plantation thinning, reduced road decommission and limited riparian restoration projects.</p>
<p><b>Alternative G</b></p>	<p>Designed, in part, to address this issue. Reductions in motorized access in the project area as a whole only to the point of achieving Forest Plan maximum road densities. Retains motorized access within former Klamath Indian Reservation boundaries, except roads specifically recommended for decommissioning to achieve resource protection.</p>	<p>This alternative, due to a lesser amount of salvage, presents less opportunity than the original proposed action. It also includes additional fuels reduction in comparison with any of the other alternatives, and therefore additional cost.</p>
<p><b>Alternative H</b></p>	<p>Retains motorized access within former Klamath Indian Reservation boundaries, except roads specifically recommended for decommissioning to achieve resource protection.</p>	<p>This alternative, due to a lesser amount of salvage, presents less opportunity than the original proposed action. However, within that scope it focuses salvage on areas that would not require more expensive helicopter yarding.</p>

**Table 2.13 Comparison of Alternatives based on how they respond to the Key Issues (Continued)**

<p style="text-align: center;">Issue →</p> <p style="text-align: center;">Alt. ↓</p>	<p><b>Issue:</b> <b>Effects on Soils, Watersheds, Aquatic Habitat</b></p>	<p><b>Issue:</b> <b>Effects on Wildlife Habitat</b></p>
<p><b>Alternative A (No Action)</b></p>	<p>No new effects on the issue concerns. Does not include road management actions that reduce sediment.</p>	<p>Retains 2,689 of 2,689 acres identified as optimal snag and down wood-dependent species habitat. Open road density remains at 3.68 mi/mi<sup>2</sup></p>
<p><b>Alternative C</b></p>	<p>Issue is based on concerns of potential effects from Alternative B (the original proposed action) on these resource values. Alt. C is partially responsive. Includes:</p> <ul style="list-style-type: none"> <li>• Design elements to protect riparian areas in compliance with INFISH.</li> <li>• 69.0 miles of road decommissioning and 72.9 miles of road closure, a comparable amount to Alternatives D and H. Alternatives C, D and H contribute the most to reductions in drainage density, and therefore the most toward reductions in the long term risk of sediment delivery</li> </ul>	<p>Issue primarily based on concerns of potential effects from Alt. B on snag and down wood habitat &amp; mule deer habitat. Alt. C would retain 2,303 of 2,689 acres identified as optimal snag and down wood habitat. It would reduce road density (a key component of mule deer habitat) to 1.3 mi/mi<sup>2</sup> in winter range and 1.76 mi/mi<sup>2</sup> for the project area. This would be compliant with Forest Plan standards. Reduction of mule deer cover from prescribed burning in transition/summer range necessitates site-specific Forest Plan amendment in 3 Duncan Cr. subwatersheds (not in Winter Range).</p>
<p><b>Alternative D</b></p>	<p>Designed to address this issue. It includes:</p> <ul style="list-style-type: none"> <li>• Least amount of upland ground disturbing activities</li> <li>• Other than roadside hazard treatment, no salvage within RHCAs</li> <li>• No new temporary road development</li> <li>• Design elements to protect riparian areas in compliance with INFISH</li> </ul> <p>71.6 miles of road decommissioning and 75.5 mi. of road closure, a comparable amount to Alternatives C and H. Alternatives C, D &amp; H contribute the most to reduction of drainage density, and the most toward reduction in the long term risk of sediment</p>	<p>Retains 2,482 of 2,689 acres identified as optimal snag and down wood-dependent species habitat. Reduces road densities to 1.3 mi/mi<sup>2</sup> in winter range and 1.68 mi/mi<sup>2</sup> for the project area as a whole. This would be compliant with Forest Plan standards. Retains all mule deer cover; would not necessitate site-specific Forest Plan amendment.</p>
<p><b>Alternative E</b></p>	<p>Not specifically designed to address this issue. Includes:</p> <ul style="list-style-type: none"> <li>• Design elements to protect riparian areas in compliance with INFISH.</li> <li>• 14.6 miles of road decommissioning and 67.4 miles of road closure, substantially less than Alts C, D and H. Would contribute to reductions in long-term risk of sediment delivery, but not to extent of those Alts.</li> </ul>	<p>Retains 2,348 of 2,689 acres identified as optimal snag and down wood-dependent species habitat. Reduces road densities to 1.9 mi/mi<sup>2</sup> in winter range and 2.57 mi/mi<sup>2</sup> for the project area as a whole. This would be compliant with Forest Plan standards. Retains all mule deer cover; would not necessitate site-specific Forest Plan amendment</p>
<p><b>Alternative G</b></p>	<p>Partially responsive to the issue. Includes:</p> <ul style="list-style-type: none"> <li>• Other than roadside hazard treatment, no salvage within Category 1 RHCAs</li> <li>• Design elements to protect riparian areas in compliance with INFISH.</li> <li>• 71.6 miles of road decommissioning and 10.4 miles of road closure, substantially less than Alts C, D and H. Would contribute to reductions in long-term risk of sediment delivery, but not to extent of those Alts.</li> </ul>	<p>Retains 1,902 of 2,689 acres identified as optimal snag and down wood habitat. Reduces road densities to 1.9 mi/mi<sup>2</sup> in winter range and 2.57 mi/mi<sup>2</sup> for the project area as a whole. This would be compliant with Forest Plan standards. However, short-term reduction of mule deer cover from prescribed burning, even without pretreatment, in transition and summer range would necessitate site-specific Forest Plan amendment in 3 Duncan Cr. subwatershed (not in Winter Range).</p>
<p><b>Alternative H</b></p>	<p>Partially responsive to the issue. Includes:</p> <ul style="list-style-type: none"> <li>• Other than roadside hazard treatment, no salvage within RHCAs.</li> <li>• Design elements to protect riparian areas in compliance with INFISH.</li> </ul> <p>71.6 miles of road decommissioning and 72.9 miles of road closure, a comparable amount to Alternatives C and D. Alternatives C, D and H contribute the most to reductions in drainage density, and therefore the most toward reductions in the long term risk of sediment.</p>	<p>Retains 2,484 of 2,689 acres identified as optimal snag and down wood-dependent species habitat. Reduces road densities to 1.3 mi/mi<sup>2</sup> in winter range and 1.72 mi/mi<sup>2</sup> for the project area as a whole. This would be compliant with Forest Plan standards. Retains all mule deer cover; would not necessitate site-specific Forest Plan amendment.</p>

Table 2.13 Comparison of Alternatives based on how they respond to the Key Issues (Continued)

<div style="text-align: center;">Issue →</div> <div style="text-align: center;">Alt. ↓</div>	<b>Issue:</b> <b>Recovery using a limited-intervention approach vs. Recovery using a full range of active management practices, including commercial salvage</b>
<b>Alternative A (No Action)</b>	No project activity. No active management to promote recovery. No salvage, prescribed fire, planting or fuels reduction activities. Entirely passive approach.
<b>Alternative C</b>	Greatest amount of commercial salvage activity of any alternative – 14,441 acres, including 10,244 acres with additional fuels treatment activity. Greatest amount of prescribed fire of any alternative (same as Alternative G) – 3,572 acres. Approximately 20,800 acres (net) of planting. A full range of riparian restoration projects, including road decommissioning, large woody debris placement, aspen enhancement, deciduous planting and road drainage improvement (same as Alternatives D, G and H).
<b>Alternative D</b>	Least amount of active management of any action alternative, therefore the most area with a limited-intervention approach. Least amount of commercial salvage activity of any alternative – 6,367 acres, including 5,680 acres with additional fuels treatment activity. Lesser amount of prescribed fire (compared to Alternatives C and G) – 2,450 acres. Approximately 20,800 acres (net) of planting. A full range of riparian restoration projects, including road decommissioning, large woody debris placement, aspen enhancement, deciduous planting and road drainage improvement (essentially the same as Alternatives C, G and H).
<b>Alternative E</b>	Not specifically designed to address this issue, therefore doesn't specifically respond in one direction or the other in regard to recovery approach. Approximately 11,490 acres of commercial salvage activity. Additional fuels treatment on 6,723 acres using a "threshold for treatment" criterion that limits treatment. No prescribed fire. Approximately 20,800 acres (net) of planting. A limited range of riparian restoration projects, including only road decommissioning (80% less decommissioning than other action alternatives) and large woody debris placement.
<b>Alternative G</b>	Greatest amount of fuels reduction activity of any alternative. Similar amount of commercial salvage activity to Alternative C – 14,419 acres. Additional fuels treatment on 16,950 acres, including 5,596 acres outside salvage units (the only alternative with this feature). Greatest amount of prescribed fire of any alternative (same as Alternative C) – 3,572 acres. Approximately 20,800 acres (net) of planting. A full range of riparian restoration projects, including road decommissioning, large woody debris placement, aspen enhancement, deciduous planting and road drainage improvement (same as Alternatives C, D and H).
<b>Alternative H</b>	Not specifically designed to address this issue, therefore doesn't specifically respond in one direction or the other in regard to recovery approach. Approximately 13,031 acres of commercial salvage activity, including 9,070 acres with additional fuels treatment activity. Lesser amount of prescribed fire (compared to Alternatives C and G) – 3,572 acres. Approximately 20,800 acres (net) of planting. A full range of riparian restoration projects, including road decommissioning, large woody debris placement, aspen enhancement, deciduous planting and road drainage improvement (essentially the same as Alternatives C, D and G).

The following tables present comparisons between the alternatives, in terms of the key issues. The analytical outputs represented below are intended for the purpose of quick comparisons between alternatives. Refer to Chapter 3 for details of the analysis process and for further details and explanation about the information presented in these tables.

**Table 2.14 Comparisons of Activities and Key Issue-Related Effects**

KEY ISSUE and Indicators		Alt. A	Alt. C	Alt. D	Alt. E	Alt. G	Alt. H
<b><i>Changes in Motorized Access</i></b>							
<b>Access and Road Management (Project Area, as a whole)</b>	Leave Open (Miles)	271.0	129.1	123.9	188.9	188.9	126.5
	Close and Decommission (Miles)	0	141.9	147.1	82.0	82.0	144.5
	Open Rd. Density (Miles/Sq. Mi.)	3.7	1.8	1.7	2.6	2.6	1.7
<b>Access and Road Mgmt. (Former Klamath Reservation)</b>	Leave Open (Miles)	12.4	12.4	7.4	9.7	9.7	9.7
	Close and Decommission (Miles)	0	0	5.0	2.7	2.7	2.7
	Open Rd. Density (Miles/Sq. Mi.)	3.8	3.8	2.3	3.0	3.0	3.0
<b><i>Economic Efficiency and Opportunity</i></b>		Alt. A	Alt. C	Alt. D	Alt. E	Alt. G	Alt. H
<b>Commercial Salvage</b>	Total Volume (MMBF)	0	73.3	33.7	66.1	73.2	63.8
	Acres	0	14,441	6,367	11,490	14,419	13,031
<b>Logging Systems</b>	Ground-Based (% of Volume)	N/A	94.4%	90.5%	95.9%	94.7%	100%
	Helicopter (% of Volume)	N/A	5.6%	9.5%	4.1%	5.3%	0%
<b>Temporary Road</b>	Re-open Unclassified Rds (Miles)	0	21.4	5.7	5.8	21.4	19.7
	New Development (Miles)	0	16.0	0.0	13.3	16.0	14.9
<b>Net Timber Value</b>	\$ per mbf	N/A	82.25	91.09	95.95	85.40	85.81
	Total (million \$)	0	6.2	3.1	6.3	6.2	5.5
<b>Job Support</b>	Direct Jobs	0	550	253	495	549	479
	Total Jobs, incl Indirect	0	825	379	744	824	718
<b>Present Net Value</b>	Current Projects @ 4% Disc. Rate (million \$)	0	- 5.2	- 7.7	- 3.3	- 6.1	- 5.3
<b><i>Effects on Soils, Watersheds and Aquatic Habitat</i></b>		Alt. A	Alt. C	Alt. D	Alt. E	Alt. G	Alt. H
<b>Effect on Functionality of Uplands (Restore – R; Maintain –M; Degrade – D)</b>		R/M/D	R/M/D	R/M/D	R/M/D	R/M/D	R/M/D
<div style="border: 1px solid black; padding: 5px;">                     The numbers to the right represent the number of <b>subwatersheds</b> within the analysis area (from amongst the eight subwatersheds), that would be Restored; Maintained; or Degraded, in relation to the listed parameter, by the given Alternative – listed in that order: R/M/D                 </div>	<b>Roads</b>	0/2/6	6/2/0	6/2/0	0/8/0	0/8/0	6/2/0
	<b>Canopy</b>	0/8/0	0/8/0	0/8/0	0/8/0	0/8/0	0/8/0
	<b>Soil</b>	0/8/0	0/8/0	0/8/0	0/8/0	0/8/0	0/8/0

Table 2.14 Comparisons of Activities and Key Issue-Related Effects (continued)

KEY ISSUE and Indicators	Alt. A	Alt. C	Alt. D	Alt. E	Alt. G	Alt. H
<b><i>Effects on Soils, Watersheds and Aquatic Habitat (continued)</i></b>						
<b>Effect on Functionality of <u>Riparian Vegetation and Bank Stability</u> (Restore – R; Maintain –M; Degrade – D)</b>	R/M/D	R/M/D	R/M/D	R/M/D	R/M/D	R/M/D
The numbers to the right represent the number of <b>subwatersheds</b> within the analysis area (from amongst the 8 subwatersheds), that would be <b>Restored</b> ; <b>Maintained</b> ; or <b>Degraded</b> , by the given Alternative – listed in that order: R/M/D	0/8/0	0/8/0	0/8/0	0/8/0	0/8/0	0/8/0
<b>Effect on Functionality of <u>Channel Conditions</u> (Restore – R; Maintain –M; Degrade – D)</b>	R/M/D	R/M/D	R/M/D	R/M/D	R/M/D	R/M/D
The numbers represent the number of <b>subwatersheds</b> within the analysis area (from amongst the 8 subwatersheds) that would be <b>Restored</b> ; <b>Maintained</b> ; or <b>Degraded</b> , in relation to the listed parameter.						
<b>Pool Frequency</b>	0/8/0	0/8/0	0/8/0	0/8/0	0/8/0	0/8/0
<b>Large Wood</b>	0/7/0	3/4/0	3/4/0	0/7/0	3/4/0	3/4/0
<b>Temperature</b>	0/4/0	0/4/0	0/4/0	0/4/0	0/4/0	0/4/0
<b>Fine Sediment</b>	0/1/0	0/1/0	0/1/0	0/1/0	0/1/0	0/1/0
<b>Fish Passage</b>	0/4/0	0/4/0	0/4/0	0/4/0	0/4/0	0/4/0
<b>Soil</b>						
<b>Fertility</b> (Restoration of “Gap” Architecture – Acres on which actions would reduce “Lignifications”; See Chapter 3)	0	14,441	6,367	11,490	14,419	13,031
<b>Sediment Risk</b> Long-Term Reduction from Enhancement Projects (Tons/Year)	0	0.7	0.7	0.6	0.6	0.7
Reductions in Drainage Density (and therefore reductions in risk of sediment delivery) (Mi/Sq. Mi)	0	0.77	0.80	0.44	0.44	0.78
Amount of Sediment* produced (short-term) in 4 units with “slight” potential for sediment transport (Tons/Acre)	0	0.05	0.05	0.05	0.05	0.05
(Tons/Year)	0	39.1	1.5	39.1	39.1	37.1

\*Sediment level is for “Checkpoint 3” – skid trail use in year of harvest (see Chapter 3, Soils section). Under consideration are the four units in the project area with identified sediment transport potential (Toolbox Units 130, 131, 133 & 133). At the next “checkpoint” following harvest (full live ground cover) sediment would drop to 0 tons/acre and 0 tons/year.

Note: BAER Report found that background erosion rates were .01-.05 tons/ac and post-fire rates were .06-.09 tons/ac.

**Table 2.14 Comparisons of Activities and Key Issue-Related Effects (continued)**

<b>KEY ISSUE and Indicators</b>		<b>Alt. A</b>	<b>Alt. C</b>	<b>Alt. D</b>	<b>Alt. E</b>	<b>Alt. G</b>	<b>Alt. H</b>	
<b><i>Effects on Soils, Watersheds and Aquatic Habitat (continued)</i></b>								
<b>Compaction</b>	Would Proposed Activities Produce Detrimental Soil Conditions in Excess of Regional Standards (20%)?	No	No	No	No	No	No	
<b>Soil and Riparian Protection and Restoration Projects</b>	LWD Placement (Miles)	0	9.6	9.6	9.6	9.6	9.6	
	Aspen Enhancement (Acres)	0	690	690	0	690	690	
	Deciduous Planting (Acres)	0	7	7	0	7	7	
	Improve Rd 2917413 Drainage?	No	Yes	Yes	No	Yes	Yes	
<b>Aquatic Habitat</b>	Attainment of INFISH Riparian Management Objectives – Yes or No	Yes	Yes	Yes	Yes	Yes	Yes	
<b><i>Effects on Wildlife Habitat</i></b>		<b>Alt. A</b>	<b>Alt. C</b>	<b>Alt. D</b>	<b>Alt. E</b>	<b>Alt. G</b>	<b>Alt. H</b>	
<b>Snag &amp; Down Wood Habitat Retained</b>	Optimal Black-backed WP (Ac)	1789	1620	1712	1651	1218	1699	
	Optimal Lewis' WP (Acres) (See Ch. 3 discussion of other aspects of retention strategy)	900	683	770	697	684	785	
<b>Mule Deer Habitat Effectiveness</b>	Winter Range (H.E. %)	10.6	12.2	12.2	12.0	12.0	12.2	
	Transition Range (H.E. %)	6.3	8.0	8.0	7.3	7.3	8.0	
	Summer Range (H.E. %)	34.0	40.3	41.5	38.6	38.6	40.3	
<b><i>Recovery of Sustainable LOS Conditions</i></b>		<b>Alt. A</b>	<b>Alt. C</b>	<b>Alt. D</b>	<b>Alt. E</b>	<b>Alt. G</b>	<b>Alt. H</b>	
<b>Fuel Treatment &amp; Fire Behavior</b>	Additional fuels treatment (in units, post-harvest); or in ¼ mile buffer area (Acres)		0	10244	5680	6723	16950	9070
	Resistance to Control in Areas of Treatment (see above row)	Rate of Spread (Chains/Hr)	2 to 6*	1 to 3	1 to 3	1 to 3	1 to 3	1 to 3
		Flame Length (Ft)	2.8-5.8*	1.5 - 1.8	1.5 - 1.8	1.5 - 1.8	1.5 - 1.8	1.5 - 1.8
	* Fuel Model 12. A fire start would likely be beyond the capabilities of initial attack with typically available forces. If the start occurred during a significant “lightning bust”, it’s possible that a large, intense stand replacement wildfire would result. Alternative A would not affect the chances for a fire start to occur, but the un-manipulated fuel succession that would result would produce persistently elevated fuel loadings, characterized as Fuel Model 12 (in many areas). These fuels conditions would pose a threat to the development and sustainability of LOS conditions.							
	Rx Fire Outside Harvest Units - (Acres) Prescribed fire would break up the continuity of the fuels and move the areas treated into a more fire resistant condition		0	3572	2450	0	3572	2450
<b>Development of LOS</b> - Acres with combinations of treatment (fuels reduction-site prep-planting) that would most likely result in future sustainable LOS stands		0	12894	8095	9388	13144	11417	