

**ROAMING SALVAGE II
ENVIRONMENTAL ASSESSMENT
EA # OR014-03-06**

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CHAPTER 1 – Introduction

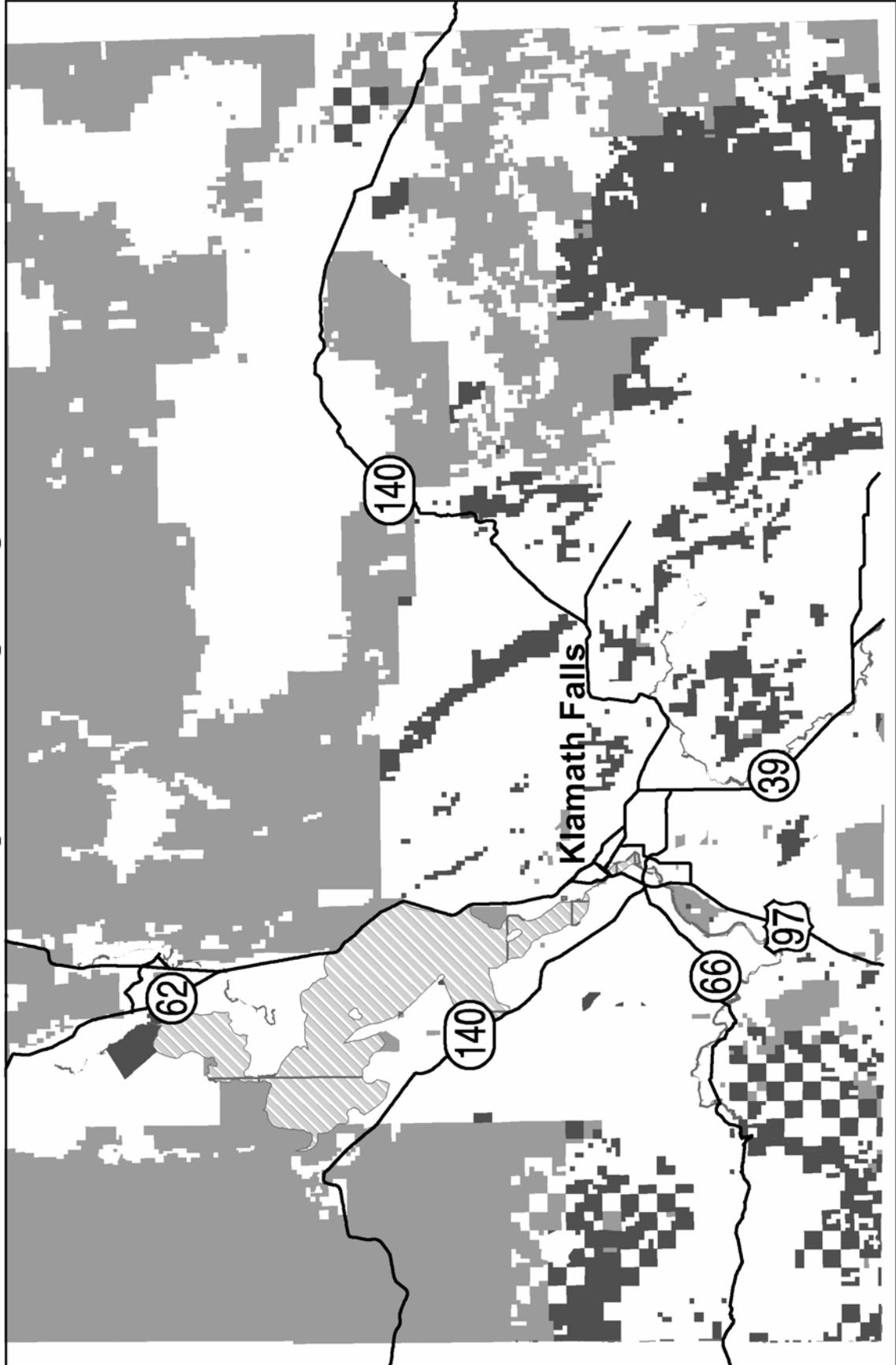
The purpose of this EA is to provide the public with information about the proposed salvage and thinning and to assist the responsible decision maker in determining if an Environmental Impact Statement (EIS) needs to be prepared. The BLM has authority to categorically exclude from analysis under the National Environmental Policy Act (NEPA) the sale and removal of individual trees or small groups of trees which are dead, diseased, injured or which constitute a safety hazard. In addition, BLM has additional categorical exclusion authority to perform hazardous fuels reduction activities (such as thinning overstocked stands and brush). Although many individual projects that are considered under this EA could be dealt with by a categorical exclusion, this EA attempts to address the full salvage program that could occur in any individual year. Any decision resulting from this analysis will consider the cumulative effects of the entire salvage program. The decisions will be based on site specific information and survey data and documented in individual decision records.

This environmental assessment (EA) analyzes a resource area (RA) wide timber salvage and limited thinning proposal for the Bureau of Land Management's (BLM) Klamath Falls Resource Area (KFRA). Although all forest lands within the KFRA are included in this analysis, salvage would be harvested primarily from the matrix land use allocations as described in the KFRA Record of Decision and Resource Management Plan (ROD/RMP) (pages 55 through 57). In other forest land use allocations, including Riparian Reserves (RR), Areas of Critical Environmental Concern (ACEC), Unmapped Late Successional Reserves (UMLSR), District Designated Reserves (DDR) and other withdrawn areas, salvage harvest would be rare or not proposed. If salvage did occur within these areas it would consist of very limited salvage of hazard trees or limited thinning around high resource value trees. Annually, salvage and thinning would take place on a small portion (less than one percent) of the forest lands considered. In any one year, salvage volume would not exceed the Annual Sale Quantity (ASQ) of 6.3 million board feet (MMBF). If salvageable mortality occurs, the KFRA estimates that approximately 2,500 acres of forest land would be salvaged over the 5 to 10 year life of this EA. If salvageable mortality occurs, salvage sale volume would replace volume from planned green timber sales. In the event of a large scale disturbance, such as a large wildfire, where annual salvage would exceed the ASQ (6.3 MMBF), additional NEPA analysis would be required.

Location

The Klamath Falls Resource Area includes approximately 215,000 BLM administered acres within Klamath County (see Map 1). The Roaming Salvage II EA analysis area includes all forested BLM lands within the KFRA. There are approximately 47,650 acres of forested BLM lands west of Klamath Falls and approximately 21,440 acres of forested land east of Klamath Falls. In this document "west side" refers to lands west of Highway 97 and "east side" refers to lands east of Highway 97. A total of approximately 69,090 acres of forested lands would be considered for salvage under this proposed action. Of the 69,090 acres, approximately 32,300 acres are designated matrix lands from which most of the potential salvage would be harvested. The remaining 36,790 acres of forest land is included within various categories of withdrawn lands. In the withdrawn lands, salvage activities would be rare and would primarily consist of harvesting scattered hazard trees. Table 1 lists approximate acres of BLM, USFS, Oregon State Lands, and other private and agency lands within and adjacent to the analysis area. All salvage activities proposed in this environmental assessment would occur exclusively on BLM-administered lands within the Klamath Falls Resource Area.

Map 1. Roaming Salvage II



BLM
 OTHER GVT
 PVT

5 2.5 0 5 10 15 miles
 Lambert Conformal Conic Projection centered on 120 Degrees 30 Minutes West
 Standard Parallels: 33 and 45 Degrees North, Origin: 41 Degrees 45 Minutes North, NAD 1927

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.

United States Department of the Interior
 Bureau of Land Management
 Klamath Falls Resource Area
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Table 1 – Land Ownership/Administration within Klamath County

Land Administration	Approximate Acreage	Percent of Total Acres
BLM Lands, KFRA	~215,000	5.3
US Forest Service Lands	~1,760,000	44.0
State, County, City Lands	~308,000	7.7
Private Lands	~1,720,000	43.0
Total Area Within Klamath County	~4,000,000	100.0

Purpose and Need

The purposes of the proposed action would be to:

- salvage dead, dying, damaged, and wind thrown timber before it loses commercial value as described in the KFRA ROD/RMP (page 55 and E-4).
- provide forest products that would help maintain the stability of local and regional economies
- reduce buildup of hazardous forest fuels

Salvage

The proposed action in this EA would salvage some dead, dying, and damaged trees. Environmental and human influenced factors including drought, insect and disease outbreaks, fire, windstorms, overcrowded growing conditions, and past management activities have contributed to significant levels of tree mortality in the KFRA. These conditions and factors are likely to continue in the future. In many areas, the trees that are dead and dying have substantial commercial value. While many of the trees also have other resource values, such as wildlife habitat, large numbers of dead and dying trees would allow some of them to be salvaged and some to be retained on site for other values.

Thinning

The overcrowded conditions that exist in many parts of the forest lands within the KFRA would be reduced in limited areas through thinning. During the first decade of implementing the KFRA FEIS, the KFRA has incurred a number of low precipitation years. The low precipitation, combined with areas of overstocked forest stands, has contributed to tree mortality. The KFRA continues to lose high value old growth pines and Douglas-firs to a combination of factors including; moisture stress, insects, disease, and understory competition. The KFRA Interdisciplinary Team has identified a need to reduce the competition around these trees to reduce the continuing mortality. In localized areas, where mortality is occurring and salvage is planned, limited thinning of adjacent overcrowded stands would help to prevent further mortality and could be used to improve the health and vigor of individual high value trees. Examples of high value trees include old growth pines and Douglas-firs and eagle roost and nest trees. Thinning overcrowded stands and around high value trees would capture some additional volume concurrently with harvesting the salvage. The proposed thinning would primarily remove understory trees, mostly white firs, beneath or immediately adjacent to the high value trees. Thinning conducted in past salvage sales on the Resource Area contributed less than three (3) percent of the total sale volume. Similar amounts of thinning would be expected under the Roaming Salvage II EA.

Hazard Trees

Ongoing tree mortality is creating a safety hazard adjacent to many BLM forest roads and recreation sites in the KFRA. Large trees that are dead, dying, or structurally defective near forest roads and recreation sites are frequently designated as hazard trees and felled. This proposal would provide a cost effective method to deal with the hazard and allow salvage of the hazard trees in some cases.

Fuel Reduction

In some areas, the buildup of dead fuels associated with tree mortality is contributing to increasing fire hazards. Although not the primary purpose of this EA, the proposed salvage treatments would help

reduce fire hazards in these areas by removing or treating accumulated fuels.

Rationale for Expedited Salvage Process

The proposed action would allow for the timely salvage of the timber mortality and limited amounts of commercial thinning over the next 5 to 10 years. Most conifer tree species rapidly lose value when they die. Salvage needs to take place within six months or at most one year if most of the commercial value is to be recovered. Planning processes and NEPA requirements that begin immediately after a mortality causing event can make the timely implementation of salvage difficult or impossible. This proposal would allow salvage to occur in a timely fashion.

Conformance with Plans and Environmental Impact Statements

These proposed treatments and projects are being planned in conformance with and under the direction of the following documents:

- Klamath Falls Resource Area Resource Management Plan/Record of Decision (KFRA RMP/ROD) June, 2 1995
- Final Klamath Falls Resource Area Resource Management Plan and Final Environmental Impact Statement (KFRA FEIS)
- Final Supplemental Environmental Impact Statement (FSEIS) on Management Habitat for Late-Successional and Old-Growth forest Related Species Within the Range of the Northern Spotted Owl, also known as the Northwest Forest Plan (NWFP), April 13, 1994
- Klamath Falls Resource Area Fire Management EA #OR-014-94-09, June 10, 1994
- Klamath Falls Resource Area Integrated Weed Control Plan EA #OR-014-93-09, July 21, 1993
- Range Reform FEIS/ROD, March 1995
- Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (January 2001)
- Healthy Forests Restoration Act of 2003 (November 2003)
- Record of Decision to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines (March 2004)

The proposed action would address management issues and recommendations identified in the following watershed analyses:

- the Jenny Creek Watershed Analysis (Tier 1 -Key Watershed) prepared by the Bureau of Land Management, Medford District and updated by the Klamath Falls Resource Area on June 31, 1995,
- the Spencer Creek Watershed Analysis (Tier 1-Key Watershed) prepared by an interagency team consisting of USFS, BLM, USF&W, and US Environmental Protection Agency (EPA) personnel, in August of 1995,
- the Topsy/Pokegama Landscape Analysis prepared by a KFRA/BLM Interdisciplinary Team in 2001,
- the Gerber-Willow Valley Watershed Analysis prepared by a BLM and USFS interagency team in July, 2003.

In addition, this EA will incorporate supporting scientific information from the Interior Columbia Basin Ecosystem Management Project, in accordance with the Memorandum of Understanding (MOU) for the Interior Columbia Basin Strategy (2003).

Public Input Summary and Issue Development

A scoping letter dated February 5, 2004, was sent to the KFRA mailing list of approximately 130 people.

The letter explained the project proposal and asked for comments. The KFRA received three written comments.

Issues

The following key issues of concern in the analysis area were raised either during the public scoping, in the plans and Environmental Impact Statements listed above, in the watershed and landscape analyzes, or by the Klamath Falls Resource Area interdisciplinary team. These issues are used to assist in developing the Proposed Action, alternatives, mitigating measures, and project design features:

Issue 1 - Recent categorical exclusion authorities are available that make this EA unnecessary and redundant.

Resolution: The recent categorical exclusion authorities available to the BLM are intended to address fire hazards and fuel reduction. The proposed actions in this EA are primarily salvage activities rather than fire hazard and fuel reductions. Therefore, the recent categorical exclusions do not adequately cover all actions proposed in this EA. See Introduction and Purpose and Need sections of this EA for more information.

Issue 2 - The proposed project appears to violate NEPA; the scope of this EA is too broad and does not include site specific information.

Resolution: The proposed salvage activities depend upon salvageable amounts of tree mortality. Such mortality is generally not predictable, particularly as to specific location and amounts of mortality. If salvageable amounts of mortality occur, site specific information including specific location, specific project parameters, specific resources present, required changes in standards and guides, and specific mitigating measures, would be included in individual timber sale decision records. As a result, the Field Manager can take a comprehensive look at all the relevant resource data, effects of an individual action, and potential cumulative effects in order to make the decision. A Finding of No Significant Impact would be included with any decision record and would consider information in this EA as well as any additional site-specific data as mentioned above. This process therefore, does allow for proper compliance with NEPA. Please refer to the Introduction of Chapter One and to the Environmental Analysis and Decision Process portion of this EA for further information.

Issue 3 - Dead trees are important for wildlife as snags and future down logs and therefore should not be harvested.

Resolution: Salvage of timber mortality would only occur if sufficient numbers of dead trees and down logs are available to leave for wildlife and other purposes. Klamath Falls Resource Area Biologists and hydrologists have written residual snag and down woody debris requirements into this EA. No salvage harvest would take place if the snag and down woody debris requirements are not met. Please refer to the Terrestrial Wildlife portion of the Environmental Consequences section and Actions within Riparian Reserves portion of Alternative A of this EA for further information. Additional snag and down wood requirements are listed in the PDFs (Appendix A) under Timber Reserved from Cutting PDFs and Down Woody Debris PDFs.

Issue 4 - Salvage harvests are not cost effective.

Resolution: Two of the primary purposes of this EA are to salvage timber mortality in a timely fashion and provide forest products that would help maintain the stability of local and regional economies. If salvage harvests can take place within six months or one year following mortality, most of the commercial value of the timber can be recovered. If salvage activities are timely, the economic recovery from the proposed salvage sales should be similar to a planned green timber sale. Potential salvage areas

that are determined by KFRA resource specialists to be uneconomical to harvest would not be salvaged. Please refer to the Introduction and Purpose and Need sections of this EA for further information.

Issue 5 - Road construction associated with salvage activities could damage streams and watersheds.

Resolution: No new permanent roads would be constructed under the proposed actions of this EA. In addition, some currently existing roads would be blocked or decommissioned. Some temporary spur roads could be constructed under this EA. The Road Construction, Road Maintenance, and Road Use PDFs in Appendix A and the BMPS in Appendix D of the KFRA ROD/RMP would protect streams and watersheds. Please refer to Alternative A for further information about roads.

Issue 6 – Salvage logging spreads invasive/noxious weeds.

Resolution: The KFRA recognizes the need to prevent the spread of noxious weeds. The Roaming Salvage II EA addresses noxious weeds in several sections including: Affected Environment (page 10), Environmental Consequences (page 17), Road Maintenance PDFs (Appendix A), and Noxious Weed Prevention PDFs (Appendix A). Actions proposed to prevent the spread of noxious weeds include: pressure washing of logging equipment to remove weed seeds and vegetative parts prior to moving onto BLM lands, pressure washing equipment prior to leaving areas with noxious weeds, and locating and treating noxious weeds prior to harvest activities.

Environmental Analysis and Decision Process

This environmental assessment is tiered to the Final - Klamath Falls Resource Area Resource Management Plan and Environmental Impact Statement. The purpose of this EA is to assess the impacts of the proposed treatments and to determine if the environmental impacts associated with the proposed treatments are significant and/or greater than those already analyzed in the previous KFRA Final EIS. If the impacts are not significant or greater than analyzed in the KFRA Final EIS, a Finding of No Significant Impact (FONSI) will be documented upon the completion of the analysis. This EA also conforms to management direction in the KFRA ROD/RMP.

This EA will:

- provide the public with information about the proposed treatments/projects
- describe the alternatives and the impacts associated with each alternative
- assist the decision maker in selecting an alternative
- provide analysis to determine if an environmental impact statement is necessary

The KFRA Field Manager, as the responsible official, will decide:

- which alternative to implement
- whether or not the alternative to be implemented is consistent with the RMP
- whether or not the alternative to be implemented is consistent with other laws and regulations (i.e., the Endangered Species Act and Clean Water Act, etc.).

Due to the uncertain and unforeseeable location and nature of forest mortality events, a Decision Record for each proposed salvage sale would be written after a mortality causing event occurs and prior to implementation of individual salvage/thinning projects. The Decision Record would contain site specific information about the proposed salvage activities including specific location, specific project parameters, specific resources present, changes in standards and guides, and specific mitigating measures. In addition, new information from on-going biological surveys or other sources that may warrant consideration would be included in the Decision Record and may require additional mitigating measures.

CHAPTER 2 – Alternatives

Alternative A - (Preferred Alternative)

Alternative A consists of timber salvage of up to Allowable Sale Quantity (6.3 MMBF) annually including limited thinning of green trees. Salvage would include dead, dying, and damaged trees. Temporary spur roads could be constructed to access salvage areas.

Salvage

If mortality causing events occur, this alternative would salvage and thin up to 6.3 MMBF (ASQ) in forest products annually. If current levels of mortality continue, forest land acreage that could be salvaged is estimated at 2,500 acres over the next five to ten years. For purposes of estimating acres, “salvage acres” means the actual area salvaged rather than the entire stand where scattered salvage occurs.

The proposed maximum volume of 6.3 MMBF is a high estimate. Under the current Roaming Salvage EA, over the past nine years, approximately 15 MMBF of salvage volume has been harvested. The highest volume salvaged in any one year was approximately 4.8 MMBF. If mortality in excess of 6.3 MMBF occurs, additional NEPA analysis would be required.

Most of the proposed salvage would occur in the eastside and westside matrix land use allocations as described in the KFRA FEIS (pages 2-18 through 2-23). Salvage or thinning in withdrawn land allocation areas, identified in the KFRA FEIS (page 2-8), would occur only with approval of KFRA resource specialists. Resource Specialists would assure that salvage and thinning would meet objectives for the specific withdrawn area. Examples of withdrawn areas include: campgrounds, the Klamath River ACEC, the Old Baldy ACEC, Late Successional Reserves, and Riparian Reserves.

Salvage would include dead, dying, and damaged trees resulting from drought, insects, disease, fire, overcrowding, and storm damage. Hazard trees and other damaged trees would also be considered for salvage. Some vegetation treatments (thinnings) could occur in the Matrix and Riparian Reserves (RRs) in order to enhance or maintain the vegetation and meet Aquatic Conservation Strategy objectives.

In addition to salvage harvests, some harvested areas with large amounts of mortality and few remaining green trees or reproduction would be planted with a variety of conifer seedlings after salvage operations.

Salvage Definitions

Salvage trees harvested would include dead, dying, and damaged trees. Snag and down woody debris requirements, as identified in the KFRA ROD/RMP on pages 26 and 27, would be met before any salvage would be harvested.

Dead Trees	-standing trees with no needles, standing trees with all brown or yellow needles, down trees, fire killed trees.
Dying Trees	-trees likely to die within the next year, standing trees with predominantly yellow needles, trees with predominantly brown needles, trees with less than 10 percent live crown, fire damaged trees with less than 30 percent live crown, fire damaged trees with a majority of dead cambium, trees severely infested with bark beetles (as evidenced by multiple pitch tubes), trees exposed to or infected with root rot diseases, trees with green needles and dead cambium.
Damaged Trees	-trees broken or sprung by storms, down trees, trees with majority of crowns missing, lightning damaged trees, severely scarred trees, trees with significant cambium death from fire or other girdling agents.

Hazard Trees

-trees meeting above definitions of “Dead, Dying, and Damaged” adjacent to roads, campgrounds, and other recreation sites. In addition, trees with structural defects caused by decay or other damage.

Generally, salvage would not include green trees. Green trees of poor vigor or form and trees that are not likely to die within the next year would not be considered for salvage unless they meet the definitions of “damaged” or “hazard” trees.

Thinning

In addition to salvage, Alternative A would include limited amounts of thinning in the immediate area of active salvage operations. The term “immediate area”, means adjacent to the actual salvage trees or adjacent to a skid trail used to access salvage trees. Thinning would be limited to patches of one acre or less. Most of the thinning would be conducted to maintain or improve the health and vigor of individual high resource value trees such as mature Douglas-firs and mature pines or eagle nesting and roosting trees that are being stressed by understory competition. Thinning would occur within a 60 foot radius around the base of the high value trees. One example of such thinning conducted under the predecessor Roaming Salvage EA, was an Old Growth Douglas-fir tree located in Township 38 south, Range 5 east, Section 23, Willamette Meridian. The Douglas-fir was approximately 103 inches diameter at breast height (DBH). Within the dripline of its crown there were 8 white fir trees ranging in diameter from 14 to 26 inches DBH. Several blowdown trees were salvaged immediately adjacent to the large Douglas-fir. Six of the green understory white firs were “thinned” to reduce competition with the Douglas-fir. Thinning of green trees under the preceding Roaming Salvage EA was estimated to have accounted for less than three (3) percent of the overall salvage volume. Under Roaming Salvage II, thinning volume would be expected to be similar to that harvested in the first Roaming Salvage EA. Thinning volume data would be recorded separately from salvage volume.

Actions within Riparian Reserves

Riparian Reserves (RRs) would be established according to the guidelines in the Best Management Practices (BMPs) section of the KFRA ROD/DMP (Appendix D). Within the RRs, salvage harvest or thinning would occur only to meet Aquatic Conservation Strategy Objectives (see KFRA ROD/RMP pages 13 and 14). Actions within RRs would be similar to those conducted under the previous Roaming Salvage EA (EA # OR014-96-04). During the last nine years, eight salvage sales were sold under the Roaming Salvage EA. No salvage or thinning was removed from RRs under those eight sales. Less than 25 hazard trees were felled but not removed from RRs under the original Roaming Salvage EA. The Roaming Salvage II EA would limit any salvage or thinning activities within RRs to no more than 10 acres annually according to the following criteria:

- No salvage harvest would occur within the inner one-half of a given RR.
- No salvage would be removed from a RR unless adequate down woody debris and snags are present in the RR (see Project Design Features, Appendix A).
- Hazard trees adjacent to roads or recreation sites, could be felled in RRs, including those within the no cut buffer.
- Felled hazard trees would be left in the RRs except where adequate down woody debris exist or where the felled hazard trees would create resource damage.
- Hazard trees felled within the no cut buffer would be left in place except where they would cause resource damage.
- Hazard trees within RRs could be moved and placed in areas within the RR lacking down woody debris or as prescribed by area biologists or hydrologists.
- Mortality would be salvaged in RRs only to meet Aquatic Conservation Strategies.

In Alternative A, trees in the RRs with high resource values, such as old growth pines or wildlife trees,

with excessive levels of understory competition, could be thinned around to reduce that competition. Thinning would occur within a 60 foot radius around the base of the high value trees. Such thinning would occur only in the immediate area of salvage operations that are occurring outside of the RR. No thinning would occur within 40 feet of perennial or fish-bearing streams or within 20 feet of intermittent streams (these streamside areas are referred to subsequently as “no-cut” areas).

Selected existing landings, skid trails, and roads could be used within the RRs when their use would be less impacting than designating and constructing new skid trails and landings outside of the RRs. Limited numbers of skid trails could be designated to cross RRs as described in the BMPs (KFRA ROD/RMP Appendix D). Otherwise, all landings and skid trails would be located outside of RRs.

Design of the projects within the RRs would consider the recommendations developed during the relevant watershed analysis. Proposed actions within RRs would be reviewed by the KFRA interdisciplinary team prior to project implementation and would be described in the decision records for individual timber sales.

Roads

In Alternatives A, no new permanent road construction would occur. Temporary spur roads may be required to access salvage areas. Any temporary spurs would be blocked or decommissioned after salvage activities are completed. Alternatives A could include renovation and/or improvement of existing roads to facilitate salvage activities. Renovation and improvement would include operations such as grading, ditch cleaning, brushing, culvert installation, and spot surfacing.

Some obliteration (ripping), decommissioning, and/or blocking of existing roads, landings, and skid trails determined to be unnecessary or creating resource damage would be considered. Up to ten (10) acres of ripping (subsoiling) could be accomplished annually under this EA to obliterate roads identified as unnecessary or causing resource damage and to mitigate impacts of compaction. Areas needing ripping would be identified by resource area specialists. Such proposed actions would be reviewed by the KFRA interdisciplinary team prior to project implementation and would be described in the decision records for individual timber sales.

Alternative B - RA wide salvage (no thinning)

Alternative B is similar to Alternative A, and includes timber salvage of up to the ASQ annually. No thinning of green trees would occur. Only dead, dying, damaged, and hazard trees (as defined in Alternative A) would be salvaged. This alternative would not significantly affect the volume salvaged.

In Alternatives B, no new permanent road construction would occur. Temporary spur roads may be required to access salvage areas. Any temporary spurs would be blocked or decommissioned after salvage activities are completed.

Road treatments would be similar to those proposed for Alternative A.

Alternative C - No Action

No Salvage, thinning of green trees, or temporary road construction would occur under this alternative.

CHAPTER 3 – Affected Environment

Vegetation

The forest lands of the KFRA can be divided into two general areas, the eastside and westside, with the dividing line being approximately Highway 97 running north from the Oregon-California border to Chiloquin, Oregon. The forest lands on the eastside are generally made up of ponderosa pine associated with sagebrush, juniper, grass species, and minor amounts of other conifer species. The eastside forest areas are drier and less productive than the westside areas. Forested areas on the westside include a variety of conifer and other vegetative species. Conditions range from dry, low and mid elevation areas with stands of ponderosa pine and Douglas-fir to high elevation areas dominated by Shasta fir, white fir and Douglas-fir. Westside forest lands are generally more productive than eastside lands, with more precipitation and deeper, more fertile soils. For more information see pages 3-10, 3-25 to 3-31, and 3-58 to 3-66 of the KFRA FEIS.

Eastside and westside forested areas are subject to a variety of mortality causing agents including; storms, fire, insects, disease, drought, and competition. Mortality from these agents is currently taking place on KFRA forest lands and is expected to continue.

Noxious Weeds

A variety of noxious weeds exist in the KFRA. Many of the populations are known and are being managed or monitored. For more information about noxious weeds in the KFRA see pages 3-21 to 3-25 and 3-63 to 3-66 of the KFRA FEIS and the Integrated Weed Control Plan and Environmental Assessment, EA # OR014-93-09.

Water Resources

The entire analysis area is located in the Klamath Basin. On the westside of the analysis area water drains into the Upper Klamath River system. On the eastside, water drains into the Lost River drainage (a part of the Upper Klamath River system) where it is used primarily for irrigation. There are three Key Watersheds in the westside analysis area: Spencer Creek, Clover Creek, and Jenny Creek. Clover Creek is a tributary to Spencer Creek.

There are about 340 miles of streams in the analysis area, of which about 40 miles are perennial and an estimated 70 miles are intermittent. In general, watersheds in the analysis area are stable and in fair to good condition. Water quality in streams ranges from poor to good. Water quality concerns include temperature, sedimentation and dissolved oxygen. Pages 3-11 through 3-20 of the KFRA FEIS describe the condition and quantity of water resources on BLM-managed lands. In addition, pages 3-10 through 3-13 of the KFRA FEIS contain an assessment of current (as of 1992) relative watershed condition for several watersheds in the analysis area. Watershed analyses have been completed for all three Key Watersheds. The Gerber-Willow Valley Watershed Analysis has recently been completed on the eastside of the KFRA. The majority of the analysis area is above the transient snow zone which generally occurs at elevations between 2,500 and 4,500 feet. Snow is the dominant form of precipitation in most years.

Riparian-Wetland Resources

Throughout the Klamath Falls Resource Area there are various riparian-wetland areas that provide a diverse array of resources and habitat values. A description of the various functions, locations and amounts of riparian-wetland areas can be found on pages 3-31 through 3-37 and Tables 3-17 through 3-19 in the KFRA FEIS.

Riparian Reserves

The FSEIS NWFP established Riparian Reserves as part of the Aquatic Conservation Strategy. The KFRA FEIS incorporates the elements of the FSEIS and applies them to the whole resource area (including those areas outside the range of the Northern Spotted Owl). The RRs are designed to provide protection for the diverse resources found in riparian-wetland areas by restricting certain activities within a designated buffer along streams and around wetlands.

Using the prescribed guidelines for the RR boundaries from the KFRA ROD/RMP (BMPs Appendix D), the Klamath Falls Resource Area would have approximately 19,450 westside acres and 9,100 eastside acres of RRs. Changes in these boundaries can only take place following a watershed analysis for the affected area.

Soil Resources

A large portion of the analysis area is included in the Soil Surveys for Jackson County and Klamath County (Southern Part). These soil surveys each contain a General Soil Map which shows the major soil groups occurring in the survey area. In addition, an Order 3 Soil Survey has been completed for the Gerber Block, the *Interim Soil Survey Report of the Gerber Block* (BLM, Leet, 2001). The soil groups mapped in the analysis area can be classified into 4 major categories: soils formed in material weathered from igneous rock on plateaus and hill slopes (west side); soils formed in material weathered from pyroclastics and igneous rock on plateaus and hill slopes (west side); shallow soils that formed in residual material derived from tuff and basalt in mountainous areas (east side) and shallow to very deep soils that formed in colluvium and material weathered from andesite, basalt, tuff, and ash in mountainous areas (east side). In all, fourteen soil associations are known to occur in the analysis area. More detailed information about soils in the analysis area can be found in the Jenny Creek Watershed Analysis, the Spencer Creek Watershed Analysis, the Gerber-Willow Valley Watershed Analysis, in the Soil Surveys published by the Natural Resource Conservation Service (formerly Soil Conservation Service), and in Resource Area files.

An intensive inventory known as the Timber Productivity Capability Classification system (TPCC) has been completed for the analysis area. This information identifies fragile sites where the timber growing potential could be reduced by management activities due to inherent soil properties and landform characteristics. Where feasible, fragile soil sites would be avoided during logging activities. If fragile soil sites are encountered, the BMPs outlined in Appendix D of the KFRA ROD/RMP designed for protection of fragile soil sites would be implemented.

Wildlife

Habitat within the analysis area ranges from sage-steppe and high desert plant communities with scattered clumps and stringers of Ponderosa pine to high elevation mixed conifer forests with large old growth trees.

A wide variety of terrestrial wildlife species are present on lands managed by the KFRA. Species considered in this EA are those that may be impacted from proposed actions (dead, dying, damaged or diseased tree removal and disturbance from human activities) associated with salvage harvest and thinning around large high resource value trees. These include both primary and secondary cavity nesters such as bats, woodpeckers, other snag dependant songbirds, owls and some terrestrial mammals (bushy-tailed woodrats, American marten, northern flying squirrels etc.). There are twelve species of bats that are known to occur in Douglas-fir forests of western Oregon and nine are known to roost in tree cavities and crevices (Arnett and Hayes 2003). More than 80 species of birds, mammals, reptiles and amphibians use living trees with decay, trees with brooms (most commonly mistletoe), hollow trees, snags and logs in the interior Columbia Basin (Bull et al. 1997). Black bear also use hollow trees with broken tops for den

sites. This provides females and sub-adults protection from larger male bears (USDA 1997).

For a more complete description of the wildlife species and habitats present in the proposed area, see the KFRA FEIS pages 3-37 to 3-47, the Spencer Creek Watershed Analysis (WA) (August 1995) pages 4-98 to 4-102 and 4-113 to 4-121, Topsy/Pokegama Landscape Analysis (July 1996) pages 61-74 and the Gerber–Willow Valley WA (July 2003) pages 95-108.

Fisheries

ESA listed Fish Species

Watersheds covered in this EA known to contain ESA species include the Gerber Watershed, South Fork Sprague Watershed, Lost River Watersheds, and the lower portion of the Spencer Creek watershed.

There are additional watersheds with both BLM administered lands and listed species in the Klamath Basin, however, these watersheds would not have actions occur within them, and therefore are not covered under this analysis. Proposed critical habitat for listed suckers located within the action area for this analysis includes Gerber Watershed and portions of Miller Creek (Unit 6), and the Klamath River (Unit 3) (FR 61744-61759, Dec. 1, 1994).

Spencer Creek is suspected to contain ESA listed Lost River (*Deltistes luxatus*) and shortnose (*Chasmistes brevirostris*) suckers, migrating upstream from JC Boyle Reservoir to spawn in the lower most portion of the watershed. However, there are no known surveys for ESA suckers in lower Spencer Creek to confirm this assumption. The documented presence of these species in JC Boyle Reservoir (Desjardins and Markle, 2000) and the life-history of these species (Buettner and Scopetone, 1991) suggest this conclusion.

The BLM manages a small number of tributaries that harbor ESA listed suckers and historic habitat for ESA listed bull trout (*Salvelinus confluentus*) in the South Fork Sprague Watershed. The upper portions of the Sprague River, including South Fork Sprague River are not proposed as sucker critical habitat (FR 61744-61759, Dec. 1, 1994), however, suckers are known to reside in most connected perennial streams. The proposed critical habitat for bull trout is upstream of BLM lands in the South Fork Sprague River by approximately one and a half river miles (USFWS, 2002). In addition, Campbell Reservoir and the associated canal from Deming Creek connect BLM land to upstream bull trout proposed critical habitat. The populations of bull trout in Sprague River Basin, as a result of habitat degradation and fragmentation plus exotic species competition and interbreeding, are generally limited to the upper most limits of their range in very small stream reaches, mostly on Forest Service administered lands. However, migratory bull trout have been known to move downstream from occupied habitat into lower stream reaches (R. Smith personal communication, 2002).

Sampling data of the Gerber population of shortnose sucker appears to indicate continued recruitment of juvenile suckers to adult age-classes (USFWS 1993). Spawning and larval rearing is known to occur in Barnes Valley Creek, Lampham Creek, Pitchlog Creek, Long Branch Creek, Barnes Creek, Ben Hall Creek, and Miller Creek (USFWS, 1993; BLM Unpublished Survey Data). Miller Creek is thought to contain both Lost River and shortnose suckers. Miller Creek is diverted several miles upstream of the Lost River and connectivity occurs only when Gerber Dam spills.

Most adult suckers occupy tributary stream reaches only during spawning. Spawning occurs in the spring triggered by stream flow and temperature (Buettner and Scopetone 1991). Post spawning adults emigrate downstream to lakes and larger bodies of water for the rest of the year. Incubation of eggs is very short, approximately 2-4 weeks, until hatching (Rossa, 1999). Larval suckers occupying stream edge habitats from late spring to early summer, depending on persistence of flow. The limited swimming capability of larval fish results in downstream movement of larvae towards lucastrine habitat. In Long Branch Creek, a tributary of the Gerber Watershed, there is a resident form of adult sucker which appears

to persist through the summer associated with perennial spring flow.

Bureau Sensitive Fish Species

Redband trout (*Oncorhynchus mykiss* sp) are widely distributed across the Klamath Basin, including Jenny, Spencer, Gerber, and Miller Creeks, Lost River, and the South Fork Sprague River. Redband trout occupy most tributary habitat year round, expressing both a resident and adfluvial (migrating to downstream lakes) life-history. Redband spawn typically in the spring associated with increasing water temperatures and stream flow (Behnke 1992). Egg incubation is heavily influenced by temperature and is often locally variable. Typical incubation periods last between 4 weeks at 12°C, to 12 weeks at 4°C (Bjornn and Reiser 1991).

Klamath largescale sucker (*Catostomus snyderi*) are also widely distributed across the Klamath basin including the Lower portion of Spencer, Gerber and Miller Creeks, Lost River, and South Fork Sprague watersheds. Largescale sucker have similar life history patterns as ESA listed suckers described above.

Jenny Creek smallscale suckers (*Catostomus rimiculus* sp) are resident to the Jenny Creek watershed, including Johnson Creek and Sheepy Creek in the Klamath Falls Resource Area (Rossa 1999). Adults reside in the mainstem of Jenny Creek and Johnson Creek and migrate to tributaries to spawn during similar conditions and timeframes as described for ESA listed suckers above.

Other Aquatic Species

The Klamath Basin supports a host of native and exotic aquatic species. Spawning and stream occupancy varies based on the life history and species. A complete list of fish species in the KFRA can be found in the KFRA FEIS, Appendix Q and a general description of fish habitat in the KFRA can be found on page 3-41, Map 3-6, and Table 3-21.

Special Status Terrestrial Species and Critical Habitat

There are several special status terrestrial species that occur in the forested habitat for the proposed project. These species and their status are described in Table 2. A description of the species and their habitats can be found in the KFRA FEIS pages 3-37 to 3-47, the Spencer Creek Watershed Analysis (WA) (August 1995) pages 4-98 to 4-102 and 4-113 to 4-121, the Topsy/Pokegama Landscape Analysis (July 1996) pages 61-74, and the Gerber – Willow Valley WA (July 2003) pages 95-108.

Table 2 - Terrestrial Special Status Species That Occur in or Adjacent to the KFRA (BLM SO database)

Species	Current Status	Known Occurrence or documented on KFRA
Bald Eagle	Federally Threatened	19 Nest Territories
Northern Spotted Owl	Federally Threatened	15 Nest Territories
Pacific Fisher	Federal Candidate	Historic Range
Canada Lynx	Federally Threatened	Historic Range
Great Gray Owl	Bureau Tracking	1 Activity Center
Flammulated Owl	Bureau Sensitive	2 Areas of Occurrence
White-headed Woodpecker	Bureau Sensitive	Documented
Black-backed Woodpecker	Bureau Sensitive	Documented
Northern Goshawk	Bureau Sensitive	12 Nest Territories
Fringed Myotis	Bureau Assessment	Documented on adjacent private lands
Townsend’s Big Eared bat	Bureau Sensitive	Documented
<i>Deroceras hesparium</i> (Evening Field Slug)	Bureau Sensitive	Documented
<i>Fluminicola sp. 3</i>	Bureau Sensitive	Documented

Designated Critical Habitat for the Northern Spotted Owl exists on the westside of the Resource Area. There are approximately 9,843 acres of Nesting, Roosting, and Foraging (NRF) habitat within the Designated Critical Habitat and a total 16,869 acres of NRF habitat within the KFRA. Of the 15 nest territories all but two of the spotted owl territories are associated with reserve areas (UMLSRs/DDRs). These two territories were established after the FSEIS (NWFP) and are within the Matrix land allocation.

Pacific Fisher

During the preparation of this analysis the Pacific fisher was listed under the Endangered Species Act as a Candidate Species. The west side of the KFRA may have contained some suitable habitat for fisher historically, although historic population distribution and numbers are not clearly defined. Surveys for forest carnivores (marten, fisher, wolverine and lynx) using baited camera stations were conducted on the west side of the resource area from 1998-2001. No detections for fisher occurred; additionally no sightings have been documented and trapping records indicate that no fishers were trapped on BLM lands within the KFRA (personal conversation Tom Collom ODFW). There are two current populations known in Oregon, one in northern Siskiyou Mountains of southwestern Oregon and the other in the southern Cascades Range primarily in the Rogue River National Forest, the Butte Falls RA of Medford BLM, and the Crater Lake area. This population was reintroduced from a population in British Columbia (USDI, 2004). There was an attempt in the early 1960's by ODFW for a reintroduction of 11 fisher near Buck Lake on the west side of the resource area but there is no indication that any survived from this attempt. Pacific fisher, even under historic habitat conditions, were rare within the analysis area.

Due to the current checkerboard ownership of BLM lands, forest management activities on much of the adjacent private lands, and fragmentation of the forested habitat it is unlikely that current habitat conditions are suitable for fisher. Surveys and the lack of sighting and trapping information would support this conclusion. For that reason they will not be analyzed further in this document.

Canada Lynx

The lynx is listed as Threatened within its range under the Endangered Species Act. Prior to its listing, in the winters of 1998 through 2001 forest carnivore surveys were conducted using photographic bait stations (designed to detect marten, fisher, wolverine, and lynx) within the KFRA. No lynx were detected during these surveys.

In 1999, a lynx habitat analysis was conducted using interagency guidelines, as recommended by the Lynx Science Team, to determine if lynx habitat existed within the Lakeview District, including the proposed project area. Following the criteria for identifying and mapping suitable lynx habitat, no lynx habitat existed within the Lakeview District, BLM, including the proposed project area. Due to this analysis and its findings, the potential impacts to the Canada lynx from this action will not be analyzed further in this document.

Survey and Manage Mollusk and Fungi Species

On March 23, 2004 a Record of Decision was signed that removes the Survey and Manage Mitigation Measure Standards and Guidelines from the Northwest Forest Plan. This decision became effective April 21, 2004. Some of the species have been moved into Special Status Species Categories. They are included in the Special Status Species table of this document.

T&E Plant and Fungi Species

There are no known populations of listed Threatened or Endangered (T&E) plant species within the KFRA. There are however, other special status plant species widely scattered throughout the resource area. For more information including a list of special status plants see pages 3-41 to 3-47 in the KFRA FEIS. The March 2004 Record of Decision to Remove Survey and Manage Mitigation Measures

Standards and Guidelines moves some species of fungi that were formerly on the Survey and Manage lists to the Special Status Species Program. One fungi species (*Boletus pulcherrimus*) found on the KFRA will be included as a Bureau Sensitive Species on the special status species list.

Grazing

The Klamath Falls Resource Area administers livestock grazing on 95 grazing allotments. There are 10 allotments on the westside and 85 on the eastside. These allotments encompass over 95 percent of the Resource Area. There are some wetland and riparian areas that have been closed to grazing to protect the habitat values found there. The seasons of use for these allotments vary, but the earliest grazing begins in mid April and the latest grazing ends in late October. The majority of the allotments have a season of use from the beginning of May through late July.

Numerous structural improvements have been built throughout the Resource Area to facilitate livestock grazing. Table 3-45 on page 3-79 in the KFRA FEIS, gives a listing of the improvements. Fencing is the improvement that could be most affected by timber harvest operations. Currently, there are approximately 175 miles of fencing throughout the resource area. Additional information on livestock grazing can be found on pages 3-76 through 3-78 in the KFRA FEIS.

Cultural Resources

There is evidence of human activity over the past 10,000 years within the proposed project area, particularly in the areas adjacent to springs and along stream channels. The Klamath, Modoc, and Shasta tribes were present in the analysis area prior to European settlement. For a more thorough discussion of cultural resources within the KFRA, see pages 3-49 to 3-50 of the KFRA FEIS.

Recreation

The proposed project area provides opportunities for a wide variety of outdoor recreation activities, occurring year round, in both dispersed and moderately developed settings. For more information and details on recreation see pages 2-44 to 48, 3-52 to 58, and Maps 2-8 and 2-10 in the KFRA FEIS.

Visual Resources

The BLM has a basic stewardship responsibility to identify and protect visual resource values on public lands. This is accomplished through the Visual Resource Management (VRM) program. Through this program, all BLM lands are inventoried and managed in specific VRM classes, and proposed projects may be designed or modified to avoid degradation to affected visual resources. See pages 2-40, 3-50, and Map 2-5 in the KFRA FEIS for complete discussion and location of visual resource management classes.

Wilderness

There are no designated wilderness areas in the resource area. The approximately 320 acre Mountain Lakes Wilderness Study Area (WSA), located east of and adjacent to the existing Mountain Lakes Wilderness, is being considered for designation as wilderness. For more information on wilderness resources, refer to page 2-42, 3-52, and Map 3-8 of the KFRA FEIS.

Special Areas

Several special areas, including Areas of Critical Environmental Concern (ACECs) and Research Natural Areas (RNAs) are located within the resource area. They are to be managed to maintain, protect or restore the special features that they contain. See pages 2-37 to 2-39 and Map 2-4 of the KFRA FEIS for location of these areas.

Wild and Scenic Rivers

The upper Klamath River was designated a Scenic River and is included in the National Wild and Scenic Rivers system as of September 1994. The Klamath River ACEC is excluded from planned timber harvest (see page 45 of the KFRA ROD/RMP). In addition, the area between the powerhouse and the Oregon/California state line is not available for planned timber harvest (page 2-38 of the KFRA FEIS). However, treatments for hazard tree removal and forest health may be performed in these areas.

CHAPTER 4 – Environmental Consequences

This chapter summarizes the environmental consequences of implementing the alternatives described in Chapter 2. The following activities associated with the proposed alternative are included in this analysis:

- Salvage harvest and thinning of up to 6.3 MMBF annually.
- Thinning of green trees in patches up to one acre in size and around individual high value trees.
- Thinning around selected high resource value trees in Riparian Reserves.
- Potential construction of temporary spur roads outside of Riparian Reserves.
- Obliteration, decommissioning, or closure of identified roads, including ripping of up to 10 acres annually.

All impacts expected from the proposed alternative have been described and analyzed in the KFRA FEIS and are approved in the KFRA ROD/RMP. More information regarding specific environmental consequences and cumulative effects within the KFRA from these types of forest treatments can be found on pages 4-1 through 4-143 of the KFRA FEIS. No adverse impacts beyond those described in the KFRA FEIS, Prescribed Fire EA #OR-014-94-09, or Noxious Weed EA #OR-014-93-09 are expected for the following resources:

- air quality (see KFRA FEIS pages 4-8 to 4-9),
- soils (see KFRA FEIS pages 4-11 to 4-12),
- vegetation/riparian vegetation (see KFRA FEIS pages 4-35 to 4-42),
- special forest/natural products (see KFRA FEIS pages 4-39 to 4-124),
- wildlife and fisheries (see KFRA FEIS pages 4-44 to 4-67),
- cultural resources (see KFRA FEIS pages 4-93 to 4-97),
- recreational/visual resources (see KFRA FEIS pages 4-97 to 4-108)

The following resources are not present, or would not be impacted by any of the proposed alternatives: prime and unique farmlands, mining claims, paleontological resources, wilderness areas, roadless areas, Native American religious sites, wild horses/burros, or hazardous materials.

In 1996 the KFRA began implementing the first Roaming Salvage EA (EA# OR014-96-04). The purposes of the first EA were similar to this Roaming Salvage II EA, to salvage mortality in a timely manner and provide forest products to contribute to stable local and regional economies. During the last nine years eight salvage sales have been sold and approximately 15 MMBF of salvage volume has been harvested. Seven of the sales were primarily scattered mortality salvage and one was the salvage of approximately 90 acres of stand replacing fire. Impacts associated with two of the salvage sales were monitored. The Lower Spencer Salvage Sale included scattered blowdown and mortality salvage that was monitored by an interagency team from the Regional Ecosystem Office (REO). The Bull Springs Fire Salvage was the salvage of approximately 90 acres of stand replacing wildfire that was monitored by a KFRA Interdisciplinary Team. Impacts from both monitored salvage sales were determined not to exceed impacts analyzed in the KFRA FEIS (see Lower Spencer Salvage and Bull Springs Fire Salvage monitoring reports). Impacts expected from implementation of the Roaming Salvage II EA should be similar to impacts from these two monitored sales. Documented impacts associated with Lower Spencer Salvage and Bull Springs Fire Salvage will be further discussed in the environmental consequences section of this EA.

Vegetation

In non-fire areas, under Alternatives A and B, the widely scattered and selective nature of the proposed harvests would have minimal impacts to live vegetation. Some minor damage to residual vegetation from skidding activities and falling of salvage trees would occur. The proposed alternative, Alternative A, would harvest some green trees through limited thinning. The amount of green trees harvested would be

minimal and would be of a localized and selective nature. The thinning would benefit some high resource value trees such as mature ponderosa pines, sugar pines, and Douglas-firs by removing understory and adjacent competition as well as removing ladder fuels that could contribute to crown fire in these trees. Alternatives B, and C would not cut green trees or provide a thinning benefit.

Under Alternatives A and B, in the event of fire salvage, only dead and dying trees would be salvaged. Since the trees being salvaged would be dead or dying (no thinning of green trees in fire salvage situations), little impact would occur to remaining live vegetation. Alternatives A and B would reduce fire hazards to some extent by removing some of the fuels that have been building up in forested areas. In areas of concentrated mortality (burned areas, disease pockets, etc.), the reduction of fuels could be significant. In other salvage areas, the benefit would be minor due to the widely scattered and discontinuous nature of the potential tree removal.

Alternative C would not reduce fuel buildups or provide forest products for local and regional economies. Some trees with high resource values, such as eagle nest trees and old-growth pines and Douglas-firs would remain at risk due to competition from understory firs and possible ladder fuel induced crown fire. The number of high resource value trees not relieved of competition would be minor, likely less than 500 trees over the 5 to 10 year life of the EA.

Noxious Weeds

Implementation of the PDFs outlined in this proposal should limit the dispersal of noxious weeds as a result of the salvage activities proposed in Alternatives A and B (see Noxious Weed Prevention PDFs Appendix A). Alternative C would have no effect on current rates of noxious weed dispersal.

Hydrology

In unburned stands, the effects of dispersed salvage and/or thinning on hydrologic processes would be minimal. The removal of scattered dead/dying and green trees would not significantly affect processes such as snow accumulation and melt, canopy interception, or evapotranspiration on a watershed (or even a subwatershed or catchment) scale. Use of skid trails and roads could affect infiltration rates and runoff generation at the local scale, although implementation of PDFs and BMPs would minimize effects to water quality and channel processes.

Salvage in burned stands could both accentuate and ameliorate the impacts of fire on hillslope hydrologic processes such as runoff generation, surface erosion, and sediment production. Removal of fine and coarse organic matter could reduce infiltration rates and increase overland flow. Yarding activities could increase the extent of disturbed areas. Construction and/or use of skid trails and roads could increase the availability of fine sediment that could then be delivered to stream channels. Alternatively, water-repellant soil layers formed during high severity burns can be broken apart by ground-based logging activities, thereby reducing the impacts of fire on infiltration and runoff generation. The potential impact of salvage activities, relative to the impact of the fire that created the salvage opportunity, will vary on a case-by-case basis. The PDFs and BMPs contained in this document, if properly implemented, would reduce potential impacts from post-fire salvage logging.

Post salvage monitoring associated with a recent KFRA fire salvage (USDI 2003, Bull Spring Fire Salvage Monitoring Report) included observations by the KFRA IDT related to erosion. Monitoring indicated that following the salvage harvest, ground based skid trails and landings were waterbarred, seeded, and had logging debris deposited on them. Generally, logging activities did not cause an increase in hillslope erosion. Soil erosion from hillslopes and skid trails appeared to be minor or non-existent.

According to the Bull Spring Monitoring report, a main road that was blocked, located in the bottom of a drainage did show signs of erosion. A recommendation of the IDT was to put more logging slash on

closed roads and skid trails in the future to reduce runoff velocity and resultant erosion.

Water Quality

Direct and indirect impacts to water quality would be minimal. Ground disturbance during logging activities (especially during post-fire salvage) could increase sediment production from hillslopes. In the case of post-fire logging, it is likely that the fire itself, rather than the post-fire logging, would be the principal cause of increased sediment production. Limitations on salvage activities within RRs would ensure that project implementation does not impair the capacity of these areas to capture sediment generated from natural or anthropogenic erosion. Some sediment could enter streams as a result of soil disturbance on roads that cross or are in close proximity to streams and by skidding across streams. Soil disturbance and sedimentation to streams could result from construction and obliteration of temporary roads, as well as from road maintenance, road obliteration, and hauling activities on existing roads. Because no new roads would be constructed in Riparian Reserves and road mileage would remain stable or be reduced in Key Watersheds and the KFRA as a whole, it is unlikely that the proposed actions would cause increased sediment production in the long term.

Effects of salvage and thinning on stream shading would be minimal. Limitations on logging within Riparian Reserves (discussed in the Riparian Reserve Management PDFs, Appendix A) would protect the primary source of vegetative shading of streams.

Riparian-Wetland Resources

Actions proposed in Alternatives A and B would have minor impacts to riparian and wetland areas. Salvage of non-hazard trees and thinning of green trees would occur only as needed to meet ACS objectives for riparian/aquatic habitat. Felling and removal of hazard trees could reduce coarse woody debris (CWD) recruitment, but only over a small portion of the Riparian Reserve network for any given stream. By definition, such trees have a high likelihood of mortality, and their removal would have no long-term consequences for stream shading.

Yarding activities and road maintenance and use could cause delivery of sediment to riparian areas and wetlands. These potential impacts would be minimized by implementation of the PDFs and BMPs. Road obliteration and decommissioning within or adjacent to riparian areas would benefit the ecological function of these areas.

Implementation of Alternative C (No Action) would have no direct impacts to riparian and wetland areas. Indirect impacts could include some increased fire hazard if fuels that would have been salvaged or treated under Alternatives A and B continue to accumulate. Some large riparian shade producing conifers, currently existing in overcrowded conditions, would remain at risk without the thinning proposed in Alternative A.

Soils

The potential adverse impacts to soil resources resulting from the activities outlined in Alternatives A and B are described in the KFRA FEIS (pages 4-11 through 4-24 and Appendix S, Soil Resources). The Aquatic Conservation Strategy in the KFRA FEIS and in the FSEIS (NWFP) and the BMPs (Appendix D KFRA ROD/RMP) and PDFs (Appendix A) of this EA selected for this analysis area would reduce or avoid adverse effects resulting from the implementation of these alternatives. The following information summarizes the impacts to soil resources from the proposed alternatives.

Direct and indirect adverse impacts to soils and soil productivity include compaction and displacement, removal of soil surface cover, and changes in nutrient status. The relatively flat topography and low erodibility of forest soils in the analysis area reduce the probability of impacts resulting from changes in

soil surface cover to low. The BMPs (KFRA ROD/RMP Appendix D) and the PDFs (Appendix A) outlined for the alternatives would prevent or minimize other adverse impacts to soil productivity or would limit the impacts to levels described in the KFRA FEIS.

Soils in burned-over areas are often more susceptible to detrimental impacts than they were in pre-burn conditions. As a result, use of equipment for fire salvage could increase the risk of erosion and displacement. Monitoring results from recent salvage sales include soil impacts information. The Lower Spencer Salvage and Bull Spring Fire Salvage sales were monitored for soil disturbance, erosion, and detrimental soil impacts. Monitoring summaries indicated that soil impacts from both sales were within parameters established by the NWFP and both sales had soil impacts no greater than those described in the KFRA FEIS (REO 1998, Lower Spencer Salvage Monitoring and USDI 2003, Bull Spring Fire Salvage Monitoring). Monitoring of the Bull Springs Fire Salvage included observations related to erosion. Monitoring indicated that following the salvage harvest, ground based skid trails and landings were waterbarred, seeded, and had logging debris deposited on them. Generally, logging activities did not cause an increase in hillslope erosion. Soil erosion from hillslopes and skid trails appeared to be minor or non-existent.

There are areas south of Highway 66, for example the Grenada area, that have special soil and site productivity concerns. Soils in these areas generally have a thin organic horizon and, therefore, are susceptible to further organic horizon reduction and compaction from logging activities. Because long-term site productivity is associated with soil organic reserves, use of ground-based logging equipment such as tractors and skidders needs to be limited as much as possible to existing skid roads in these areas in order to minimize further impacts to soils. Existing skid trails would be used whenever possible as proposed in the PDFs. New skid trails would be designated by authorized personnel. Adhering to the PDFs defined in Appendix A and the BMPs in Appendix D of the KFRA ROD/RMP would protect the soil resources. No impacts greater than those described in the KFRA FEIS would be expected.

Implementation of Alternative C (No Action) would have no direct impacts to soil resources. Indirect impacts could occur if areas of high mortality and therefore high fuels loads were not salvaged or treated and subsequently experienced high intensity fire events. Such events could have adverse impacts to soil resources.

Terrestrial Wildlife

Since the primary objective of the proposed project, under Alternatives A and B, would be to remove dead, dying, diseased and damaged trees it is important to note the value of these trees for wildlife. Both living trees with decay and hollow snags are important habitat for wildlife. Living trees with decay allow woodpeckers to excavate through the sound layer and form nest cavities. Trees with dead tops provide resonating towers for woodpeckers to mark their territory (USDA 1999). They also afford protection and foraging opportunities for an array of avian and mammalian species. Snag height as well as snag diameter are important factors to provide habitat for wildlife. The thickness of the surrounding wood of the cavity is important for thermal regulation and protection from predators. Black bears, marten, and raccoons can break into cavities if the shell surrounding is too thin (USDA 1997). Pileated woodpeckers typically nest 30 to 50 ft above the ground. To have enough girth (8 x 24 inches) for adequate surrounding wood at this height requires larger snags (USDA 1997). Pileated woodpeckers most often used snags > 24 inches for nesting (Mannan et al 1980).

Harvest activities associated with implementation of Alternatives A and B could impact wildlife in several ways. The reduction of snags has the potential to locally impact snag dependant species such as woodpeckers, bats, nuthatches, marten and owls. For example, fluctuations in population numbers of woodpeckers may occur in response to the fluctuation in snag levels resulting from harvest. Impacts to cavity nesting and species dependant on snags for foraging such as the black-backed woodpecker could

occur if large concentrations of dead trees are harvested. However, the PDFs (Appendix A) for snag retention this EA provide for snag retention for species at the 60 percent level as analyzed for Matrix Lands in the KFRA FEIS. This total exceeds the snag retention required under the FSEIS (NWFP) Standards and Guidelines. Snag retention within Riparian Reserves and other reserve areas (DDRs, ACECs, and RNAs) within the KFRA are managed at 100 percent of optimum for snag dependant species (see PDFs Appendix A). The retention of larger snags (>20") provides for long-term snags as well as better thermo-regulation for those species that nest within them.

Under Alternatives A and B, disturbance from activities associated with removal of salvage trees would also impact local wildlife species within the immediate area of salvage harvest and haul routes. This impact would be considered a short-term localized impact and end when salvage operations are terminated in the area. Seasonal restrictions for salvage operations as proposed for special status species (see PDFs Appendix A) would minimize or remove impacts to those species and others in the area of harvest activities. However, since harvesting may occur during all times of the year, there is potential for direct impacts to wildlife during periods such as nesting, fawning and calving. Reproduction failure and in some cases direct mortality to young may occur. Soil moisture restrictions generally limit logging activities to dates later in the season when most of the critical hatching and birthing activities have already occurred. In the last nine years one of eight implemented salvage sales operated outside of the typical operating season (October 15 to June 1). That sale operated under snow logging conditions during winter months.

The impacts to snag dependant species from implementing Alternatives A or B would be similar to those described in the KFRA FEIS on pages 4-44 to 4-65 and in the FSEIS (NWFP) on pages 4-177 and 4-190. With the exception of fire salvage and other large area mortality events, the proposed salvage and thinning would remove only a small portion of any existing stand. Therefore, the potential for recruitment snags would remain high as mortality is likely to continue.

In the case of fire salvage, the PDFs for snag retention would be followed. Leaving sufficient live and dead trees (See PDFs, Appendix A) to fulfill the future CWD requirements for the site would be beneficial to wildlife species that are dependant on that substrate. Generally after a stand replacing fire, CWD has been lost from the site. However, in the short term, the decaying and falling fire killed trees would provide excess amounts of CWD. After the fire killed trees fall, there may be no potential for additional CWD or snag recruitment until regeneration has reached sufficient size to provide that structure.

The effects of implementing Alternative B (salvage with no thinning) would be similar to those described for Alternative A. Slightly less volume could be harvested per sale (although the maximum annual volume would remain the same) and slightly less area would be impacted. Alternative B would not have the benefits associated with thinning around high resource value trees. Some high resource value trees would remain at risk and many could eventually succumb to overcrowded conditions.

Implementation of Alternative C would result in no immediate logging activities and therefore, no direct impacts to terrestrial wildlife. Leaving all snags could be beneficial to those species dependant upon them. Some minor impacts would include no thinning accomplished around some high resource value trees and potentially an increase in fire hazard in some high mortality areas. Alternative C would postpone impacts to a later date and potentially to a more conventional type of timber harvest.

Special Status Species

Implementation of the PDFs (Appendix A) including seasonal restrictions, buffers, and habitat retention designed to protect bald eagles, spotted owls, great gray owls, and other special status species would result in minimal impacts to these species. Implementation of the proposed project including the PDFs would result in minimal impacts to special status species populations. The proposed action would not

contribute to the need to list, under the Endangered Species Act, any of the special status species that occur within the Klamath Falls Resource Area.

To analyze potential impacts from the proposed actions and meet the guidelines in Special Status Species Policy for Oregon and Washington it is necessary to survey and monitor the distribution and occupancy of special status species that occur or may occur within the analysis area. In order to accomplish this, KFRA biologists conduct annual surveys and monitoring of known sites for bald eagles, northern spotted owls, and northern goshawks for occupation and reproduction. All suitable spotted owl habitat on the westside of the KFRA was surveyed for northern spotted owls from 1990 to 1995. Surveys for spotted owls continue with each planned timber sale. Additionally, the KFRA has implemented a five-year radio telemetry study of northern spotted owls to determine foraging habitat used by spotted owls on the resource area. The telemetry study was implemented in April 2002 and currently birds within nine sites are equipped with radio transmitters. Great gray owl surveys started in 1996 and continue through present on all ground disturbing activities within suitable habitat in the NWFP area. Bat surveys were conducted on the west side of the resource area and adjacent forest areas in 1996. In additions, several areas on the eastside of the KFRA were monitored for bats in 2003. Forest carnivore surveys (focused on the presence or absence of marten, fisher, wolverine and lynx) were conducted from 1997-2003 within suitable habitat for carnivore species over the entire resource area and some adjacent forest and private lands. Landbird monitoring from KFRA biologists as well as monitoring through Klamath Bird Observatory and Redwood Science Labs has been on going since 1998 on both the east and westsides of the resource area. This includes point count stations as well as MAPS Stations, and long-term mist netting stations. Other special status species (woodpeckers and owls) and their distribution within the KFRA are documented from incidental sightings and detections during other surveys. Information on their distribution is kept in a database at the KFRA in Klamath Falls, Oregon. Two mollusk species found in the KFRA were moved from the Survey and Manage to the Special Status Species list. *Deroceras hesparium* (evening field slug) is a terrestrial slug that occurs in riparian and meadow habitats. *Fluminicola no. 3* is an aquatic snail that is spring associated. We have conducted pre-disturbance and purposive surveys under the Survey and Manage program for these species and will continue pre-disturbance surveys in high priority habitat. Known sites are documented in the ISMS database and will be managed according to management recommendations. Implementation of PDFs, especially riparian buffers, would prevent most of the direct impacts proposed in Alternatives A and B. Alternative C would have no direct impact on mollusk species.

Bald Eagle

Implementation of Alternatives A, B, and C would result in minimal impacts to bald eagles and their habitat. Implementation of the Project Design Features that include a limited operation period from January 1st to August 15th for harvest within ¼ mile or ½ mile line-of-sight of active nest sites would prevent direct impacts associated with logging activities. Alternative A would include some thinning around high value resource trees that would be beneficial to the long term development of eagle habitat. Alternatives B and C would not provide a thinning benefit.

Habitat modification from salvage harvests under Alternatives A and B would have minimal impacts to bald eagles. Salvage harvests may remove potential eagle roost and perch trees but adherence to the PDFs for snag retention (Appendix A) would assure that adequate perching and roosting habitat would be maintained. Arnett et al. completed a study on selective harvested stands on Doak Mountain and showed territorial occupancy and reproduction can be maintained after implementation of forest management activities which maintain appropriate structure as well as limit operating periods to minimize disturbance. Other habitat modifications (thinning and prescribed fire) around nest territories (McFall reservoir, Stukel Mountain, Stukel Mountain South, and Applegate Springs) on the Resource Area that maintained adequate large trees for roost, perch and nest trees have shown no adverse impacts to bald eagles. Alternative A would include some thinning around high value resource trees that would be beneficial to the long term development of eagle habitat. Alternatives B and C would not provide a thinning benefit

and eagle habitat existing in overcrowded conditions would remain at risk.

In the short term, under Alternative C (No Action), all potential roost and perch trees would be maintained within bald eagle habitat. However, eagle habitat trees existing in overcrowded conditions would remain at risk to understory competition. In some areas, fire hazards may increase where salvage or treatment of tree mortality has not taken place.

Northern Spotted Owl

Direct affects from disturbance under Alternatives A and B would be minimal for spotted owls. The majority of the spotted owls in the analysis area are associated with a reserve area such as an Unmapped Late Successional Reserve (UMLSR) or a District Designated Reserve (DDR). Seasonal restrictions for spotted owls as well as buffers (see PDFs, Appendix A) would minimize the risk of disturbance. Under Alternatives A and B, the harvest of salvage volume would have minimal effect upon canopy closure. In areas where individual or small patches of tree mortality are occurring, removal of the mortality would not decrease overall canopy closure. Also in areas of heavy wind throw or other large natural disturbances such as fire, the canopy closure is already lost from the disturbance and the removal of salvage would not further impact canopy closure. Under Alternatives A and B, removing large snags, damaged (broken tops), diseased (mistletoe clumps) and dying trees may limit nesting opportunities for owls within the matrix land allocation, although snag retention guidelines would minimize this potential impact. Minimal salvage activities would occur in the UMLSRs/DDRs, RRs, or other reserve areas. Within such areas the snag levels would be managed for optimum levels for all snag dependant species. Under Alternative A, the limited amount and discontinuous nature of the proposed thinning should not affect spotted owl habitat. Thinning activities would be very limited in extent and would therefore provide limited benefits.

Scattered salvage activities, as described in Alternatives A and B, leave forested stands in Nesting, Roosting, and Foraging habitat conditions. Monitoring results from a recent KFRA salvage sale indicate that salvage activities did not displace adjacent spotted owls. In one case, spotted owls moved into and successfully fledged young in an area that was salvage logged the previous year (REO 1998, Lower Spencer Salvage).

Implementation of Alternative C (No Action) would not directly affect the overall quality of spotted owl nesting, foraging, or dispersal habitat. Indirect impacts could include some increased fire hazard if fuels that would have been salvaged or treated under Alternatives A and B continue to accumulate. Some large conifers that provide habitat for spotted owls, currently existing in overcrowded conditions, would remain at risk without the thinning proposed in Alternative A.

Great Gray Owl

Harvest activities associated with implementation of Alternatives A and B could impact Great Gray Owls (GGO) in several ways. One common impact associated with timber harvests is the reduction of snags, particularly snags with broken tops and platforms (mistletoe clumps) used for nesting by GGOs.

Disturbance from activities associated with removal of salvage trees would also impact GGOs within the immediate area of salvage harvest and haul routes. This impact would be considered a short-term localized impact and end when salvage operations are terminated in the area. Seasonal restrictions for GGOs would minimize or eliminate disturbance impacts. Pre-disturbance surveys as well as PDFs for snag retention and meadow buffers described in the Great Gray Owl Habitat Requirements PDFs (Appendix A), would provide for nesting habitat as well as determine occupancy in suitable habitat.

Northern Goshawk

There could be localized impacts from human disturbance associated with harvest and hauling activities under Alternatives A and B. These impacts would be short-term and end when the project ends in that

area. Because these disturbances can happen during the nesting season, there would be potential for disturbances to nesting goshawks.

The salvage of dead and dying trees and limited thinning proposed in Alternatives A and B should have minimal impact upon northern goshawk habitat. Thinning of limited areas within overstocked stands may provide a benefit by opening up those stands and allowing goshawks access to additional areas for hunting. Over the long term, thinning would decrease the time needed for the overstocked stands to become suitable goshawk habitat. Thinning activities would be very limited in extent and would therefore provide limited benefits. Down woody debris and snag retention requirements (see PDFs, Appendix A) should ensure adequate prey habitat.

Implementation of Alternative C (No Action) would have no effect on current goshawk habitat. Indirect effects would include continuing fuel buildup in areas of tree mortality that would be salvaged or treated under Alternatives A or B, and no thinning benefit for high value trees that contribute to goshawk habitat.

Snag Obligate Species

Special status species considered to be snag obligate species include, Flammulated Owl, White-Headed Woodpecker, Black-backed Woodpecker, Townsend's Big-eared bat, and Fringed Myotis bat. Under Alternatives A and B, the reduction of snags has the potential to locally impact snag dependant species such as woodpeckers, bats, and owls. However, the PDFs for snag retention described in this EA, (Appendix A) provide for snag retention for species at the 60 percent level as analyzed for Matrix Lands in the KFRA FEIS as well as snag retention at the 100 percent level within Riparian Reserves and other reserve areas (UMLSRs, DDRs, ACECs, and RNAs).

Disturbance from activities associated with removal of salvage trees would also impact local wildlife species within the immediate area of salvage harvest and haul routes. This impact would be considered a short-term localized impact and end when salvage operations are terminated in the area. Since harvesting may occur during all times of the year there is potential for direct impacts to these species. Reproduction failure, and in some cases, direct mortality to young may occur. Soil moisture restrictions generally limit logging activities to dates later in the season when most of the critical hatching and birthing activities have already occurred, but logging activities are still possible during this critical period.

The impacts to snag dependant species from implementing Alternative A or B would be similar to those described in the KFRA FEIS on pages 4-44 to 4-65 and in the FSEIS (NWFP) on pages 4-177 and 4-190.

Implementation of Alternative C (No Action) would have no direct impacts to snag dependant species.

Fisheries and Aquatic Species

The Riparian Reserve standards and guidelines (KFFO ROD/RMP 1995) provide conservative protection for most species with significant aquatic components in their life cycles. Actions proposed under Alternatives A and B would adhere to those standards and guidelines. In general, the salvage actions proposed under Alternatives A and B are not expected to have direct impacts or linkages to indirect impacts to listed species and other native aquatic species.

Under Alternatives A and B, key management actions such as temporary road construction and road ripping may increase erosion to stream channels (Furniss et al 1991) in the short term. However, road construction or ripping would not occur in riparian areas, and the limited amount of temporary spur roads constructed in the uplands, are not expected to negatively affect aquatic resources.

Timber harvest actions could affect the exposure of stream channels to solar radiation as a result of vegetation removal, and subsequently alter stream temperatures (Chamberlin et al 1991). The proposed

salvage alternatives in riparian areas intentionally limit salvage actions to treatments around “high value” riparian resources, such as large pines and mature Douglas-fir trees. Silvicultural treatments around such high value riparian trees would be consistent with Aquatic Conservation Objectives (KFFO ROD/RMP 1995). The Proposed Action, Alternative A, through understory thinning, would protect large/mature riparian trees that would provide stream shading post treatment. Proposed treatments are not expected to have measurable effects to stream temperatures, nor subsequently affect fisheries and aquatic resources.

Protecting, and if possible enhancing, mature timber within the riparian areas is an important component in protecting the long-term disturbance regimes of riparian habitats and streams. The proposed treatments application of Riparian Standards and Guidelines and aquatic PDFs would protect and enhance the short-term and long-term large woody debris recruitment potential to stream habitats occupied by aquatic species.

Implementation of Alternative C (No Action) would have no direct effects to fisheries and aquatic species. Indirect impacts could include minor increases in fire hazard if fuels that would have been salvaged or treated under Alternatives A and B continue to accumulate. Such fuel accumulations could contribute to the risk of severe fire events that would damage habitat for aquatic species. In addition, some large riparian shade producing conifers, currently existing in overcrowded conditions, would remain at risk without the thinning activity proposed in Alternative A.

Lost River and Shortnose Suckers

The eastside of the analysis area is of special concern because it contains critical spawning habitat for endangered suckers. Some additional PDFs were created as mitigating measures to address areas within proposed critical sucker habitat. The PDFs designed to protect RRs and the PDFs specific to eastside fish bearing streams (see Appendix A) would ensure that little or no detrimental impacts to suckers would result from the salvage activities proposed in Alternatives A and B.

Implementation of Alternative C (No Action) would have no direct impacts to suckers or sucker habitat.

Bull Trout

Due to the limited distribution of bull trout in the Klamath Basin relative to potential treatment areas no impacts to the species would be anticipated to occur from the proposed action alternatives. No actions are anticipated within proposed bull trout critical habitat, thus no impacts to proposed critical habitat would be expected from implementation of Alternatives A and B. The PDFs designed to protect RRs and the PDFs specific to fish bearing streams (see Appendix A) would ensure that little or no detrimental impacts to migratory bull trout and potentially occupied habitat would result from the proposed action.

Implementation of Alternative C (No Action) would have no direct impacts to bull trout or proposed bull trout critical habitat.

Plants

No impacts to special status plants would be anticipated from implementation of Alternatives A and B due to the localized nature of the impacts of the proposed action, implementation of the PDFs associated with the proposed action, and other recommendations resulting from clearance surveys. Clearance surveys would be conducted prior to any ground disturbing activities. Recommendations would be designed to avoid any negative effects to special status plant species located during surveys.

Implementation of Alternative C (No Action) would have no direct impacts to Special Status Plants.

Grazing

For Alternatives A and B, timber harvesting activities within grazing allotments during the season of use,

would have minimal impacts.

All allotments within the resource area have fence lines that divide the allotments into separate pastures and/or define the boundary of the allotments. Fence lines also have been built to exclude livestock from areas to provide for resource protection. Gates have been included within these various fence lines to facilitate the movement of livestock and/or to provide access for vehicles. Potential adverse impacts to vegetation, water, and soil resources from unmanaged livestock grazing could occur if these gates are left open during timber harvest activities or if fence lines are cut to access timber and not immediately repaired. Fence line integrity is critical to the grazing management systems currently in use that are designed to maintain or enhance the various vegetation communities and protect water and soil resources. A discussion on the impacts to these resources resulting from excessive or untimely grazing can be found on pages 4-12, 4-14, 4-19, 4-20, 4-26, 4-33, 4-34, 4-36, and Appendix L in the KFRA FEIS.

The impact of the proposed timber harvest levels on available livestock forage quantity and condition would be negligible.

Implementation of Alternative C (No Action) would have no direct impacts to grazing or forage conditions.

Cultural Resources

Impacts to cultural resources from implementation of Alternatives A and B would be minimal. Project Design Features requiring surveys of proposed project areas prior to disturbance and buffering or avoidance of cultural sites would reduce or eliminate impacts. Cultural resource surveys would be conducted prior to entering any area to be harvested under this EA, and mitigation would be accomplished by avoidance of any cultural sites found.

If any cultural or archaeological resources are identified on the site during timber harvest, operations would be immediately halted and the Field Manager and archaeologist notified. Operations would not resume until the Field Manager approves a protection plan.

Implementation of Alternative C (No Action) would result in no harvest activities and therefore no impacts to cultural resources.

Recreation

Under alternatives A and B, temporary, minor disruption to recreational uses would occur during treatment activities. Short term disturbances to recreationists from truck traffic, equipment noise, and dust associated with treatment activities would be expected. The impacts associated with the selective thinning or mortality salvage, and minimal road building described in Alternatives A and B would not exceed those described in the KFRA FEIS (pages 4-104-108). Removal of hazard trees from high recreation use areas will improve safety for the users.

Mitigation measures, PDFs, and BMPs related to recreation resource protection are described in Appendix A of this EA and in Appendix D of the KFRA ROD/RMP.

Under Alternative C (no action), no harvest activities would take place and therefore no impacts to recreation resources would be expected and no improvement in safety would occur.

Visual Resources

Under Alternatives A and B, proposed treatment activities would have no additional adverse effects to visual resources beyond those described in the KFRA FEIS, pages 4-97 to 4-101. Project design features

and BMPs would be implemented to reduce the negative visual impacts of the proposed action within and adjacent to developed recreation areas, and in other areas with sensitive resource values. The PDFs can be found in Appendix A of this EA and the BMPs are outlined in Appendix D of the KFRA ROD/RMP.

Implementation of Alternative C (No Action) would result in no harvest activities and therefore no direct impacts to visual resources.

Wilderness

The BLM has no designated wilderness within the KFRA. Implementation of any of the proposed alternatives would result in no impacts to wilderness areas. The Mountain Lakes Wilderness Study Area, adjacent to the Mountain Lakes Wilderness Area, would be excluded from salvage activities.

Special Areas

Under Alternatives A and B, Portions of the Miller Creek, Upper Klamath River, and Yainax Butte ACECs, Clover Creek and Surveyor Forest Area Environmental Education Areas, and Tunnel Creek Wetlands could experience salvage and/or hazard tree harvesting as long as the relevant and important values for which these areas were designated are not negatively affected. The Pacific Crest National Scenic Trail would receive no timber harvesting within 50 feet either side of the trail. The Old Baldy ACEC/RNA shall receive no timber or salvage harvesting. The environmental effects from salvage timber harvesting in Special Areas is adequately described in the KFRA FEIS, pages 4-91 to 4-93. It is anticipated that removal of hazard trees, while adhering to the PDFs for Visual Resources, would have minimal impact on Special Areas. A positive effect is possible from the removal of visually contrasting dead or dying trees which present a safety hazard.

Implementation of Alternative C (No Action) would result in no harvest activities and therefore no direct impacts to Special Areas. Indirect impacts could include increased risk of wildfire if fuels continue to accumulate in areas where salvage is not accomplished and potential loss of high resource value trees in overcrowded stands that are not thinned.

Wild and Scenic Rivers

The RMP does not allow for planned timber harvest within the Wild and Scenic upper Klamath River corridor. However, under Alternatives A and B, some limited hazard tree removal/salvage along roads, and within recreation use areas would be permitted. The environmental effects of a salvage timber harvest in the Upper Klamath Wild and Scenic River are adequately described in the KFRA FEIS, pages 4-93, 95 and 103. It is anticipated that removal of hazard trees following the PDFs for visual resources and environmental protection, would have minimal impact on the scenic or recreation resources in the river corridor. A positive effect is possible from the removal of visually contrasting dead or dying trees which present a safety hazard.

Implementation of Alternative C (No Action) would have no direct impacts to Wild and Scenic Rivers. Indirect impacts could include increased risk of wildfire if fuels continue to accumulate in areas where salvage is not accomplished and potential loss of high resource value trees in overcrowded stands that are not thinned.

Cumulative Effects

Many individual projects considered under this EA could be dealt with under a categorical exclusion. This EA considers potential cumulative effects of the entire salvage program. Any decision resulting from this analysis will take a comprehensive look at all the relevant resource data, effects of an individual action, and potential cumulative effects in order to make the decision.

Due to the requirements outlined in the PDFs and BMPs including required predisturbance surveys for wildlife, special status plants, and cultural resources, no adverse cumulative effects in addition to the environmental consequences described in Chapter Four are expected for the following resources: vegetation, noxious weeds, survey and manage mollusk and fungi species, grazing, cultural resources, recreation, visual resources, wilderness, special areas, and wild and scenic rivers.

Additional cumulative effects information is provided for the resources described in the following paragraphs.

Soil Resources

Soil productivity has been altered as a result of past management activities on much of the commercial forest land in the analysis area. As a result of past harvest activities, compaction and soil displacement have increased over historic levels. The KFRA FEIS anticipated a 5 percent reduction in growth on forested lands as a result of soil compaction (Pierle and Lewis, September 1991). Other impacts, such as loss of soil cover and changes in nutrient status have also occurred, but vary greatly depending on site conditions. Because the proposed activities are dispersed over a wide area, it is unlikely that the 20 percent threshold for detrimental soil conditions would be reached from implementation of Alternatives A or B (see Environmental Protection PDFs, Appendix A for more information on the 20 percent threshold). However, some areas that would be treated currently exceed this threshold and in the event of a stand replacing fire or other large mortality event the 20 percent threshold would be approached. Some subsoiling and obliteration of roads in conjunction with implementation of the alternative would reduce existing levels of detrimental soil conditions for a limited number of acres.

Implementation of the proposed alternative could disturb or re-disturb approximately 2,500 acres of forest land over the life span of this EA. This acreage represents less than one percent of the analysis area and less than four percent of all the commercial forest land in the analysis area.

Water Resources

Analysis of cumulative impacts expected from implementation of Alternative A is based on the following assumptions:

- In the next 10 years, approximately 2,500 acres in the analysis area could be treated;
- 75 percent of the treatment acres would occur on the westside (based on the distribution of commercial forest lands in the analysis area);
- Of this acreage, approximately 50 percent would occur within the Spencer and Jenny Creek watersheds;
- Of the treatments within the Spencer and Jenny Creek watersheds, approximately 60 percent would occur in Spencer Creek and 40 percent would occur in Jenny Creek; and,
- No new permanent roads would be constructed.

These assumptions are designed to estimate the maximum extent of salvage harvest that could occur in the Spencer and Jenny Creek Tier-1 Key Watersheds and therefore may overestimate potential impacts in these key watersheds (they are “conservative”).

Based on the information above, it is estimated that the extent (measured in acres) of treatments implemented under this alternative would be lowest in the Spencer Creek and Jenny Creek watersheds (Table 3). Because these two watersheds contain relatively small portions of BLM-administered lands, however, the proposed action would affect a larger proportion of the BLM land base in the Spencer Creek and Jenny Creek watersheds.

Table 3 - Estimated extent of treatments within various watershed areas.

Area	Estimated Extent of Treatments	Percent of KFRA-Administered Lands within Area	Percent of Entire Watershed Area
Spencer Creek watershed	565 acres	6.5%	1.0%
Jenny Creek watershed	375 acres	3.1%	0.2%
Other Westside areas ¹	935 acres	3.3%	0.2%
Eastside areas ²	625 acres	0.6%	0.2%
Notes: (1) Includes the Little Butte Creek, Macdoel/Dorris, Middle Upper Klamath River, Klamath/Copco, and Klamath River/Iron Gate 5 th -Field watersheds; (2) For this analysis, includes only the Gerber Reservoir and Upper Lost River 5 th -Field watersheds.			

The proposed action (alternative A) would cause soil displacement and compaction and a minor reduction in water use through evapotranspiration. These impacts would either be dispersed across a given area (in the case of scattered mortality salvage) or concentrated (in the case of salvage following windstorms or fires). Salvage could result in removal of large volumes of down material in naturally-created patches of up to approximately 5 acres in size (blowdown events), and thinning of stands affected by larger-scale disturbances (up to approximately 250 acres). Concentrated activities would be more likely to cause adverse impacts. Salvage of large areas affected by high intensity fire would have the greatest potential for adverse impacts. The scope of such actions under this alternative would be limited by the upper limit on annual salvage volume (i.e., a large wildfire would likely exceed the annual volume limit).

Implementation of Project Design Features would prevent or mitigate adverse impacts to soil properties, processes of runoff generation, and riparian processes/water quality. Therefore, cumulative effects to water resources would be low.

Implementation of Alternative B would harvest less volume than Alternative A. The lower harvest levels would result in fewer skid trails and landings than Alternative A. Impacts resulting from implementation of Alternative B would be similar to, but proportionally lower than those expected from Alternative A.

Implementation of Alternative C would result in no harvest activities and therefore no additional cumulative impacts.

Riparian-Wetland Resources and Riparian Reserves

Riparian-wetland resources and riparian reserves would be protected by the establishment of RRs as described in the PDFs and BMPs. In addition, little if any salvage harvest would occur in the RRs. Thinning actions within RRs would be rare and would be designed to promote the health of mature trees. Only activities that would promote aquatic conservation strategies would be conducted within the RRs. Therefore, no additional cumulative impacts would be expected for riparian-wetland resources or riparian reserves.

Wildlife

Due to the intermingled private and BLM lands on the westside of the Resource Area, impacts to the species considered in this EA are elevated due to the current conditions on adjacent private lands. Increased harvest on private lands has resulted in a continuing decline in suitable habitat for those species dependant upon snags for foraging and nesting. These conditions on private lands are considered long-term impacts to these species and have increased the importance of snag retention on public lands.

The proposed projects would have little or no impact on habitat conditions on BLM lands over the long term. Snag levels, canopy closure, and species composition, would likely be unaffected if any of the alternatives are implemented. Alternatives A and B may reduce the recruitment potential for down woody debris, but they would not reduce it below levels prescribed in the FSEIS (NWFP). In the case of fire salvage over a large area, the fire mortality alone would likely reduce recruitment potential for snags

and down woody debris over the long term.

In Alternative A, the thinning treatments around high resource value trees would help to maintain the old growth component of some stands. This treatment would also provide some long term protection to habitat associated with those trees.

Alternatives A and B should provide minor fire hazard reduction over the long term.

Fisheries and Aquatic Species

Both action alternatives are designed to protect or enhance riparian areas that could contribute to fisheries and aquatic species habitat. Minimal salvage activities are expected for RRs and any thinning would be conducted only to promote the health of mature trees with in the RRs. Possible sediment movement to streams associated with road obliteration and yarding activities would be considered a short term impact and would be reduced by adhering to PDFs and BMPs designed for the protection of water resources and RRs. Therefore, no adverse cumulative effects are expected for fisheries and aquatic species.

Landscape Analysis

One of the primary objectives of this project is to accomplish the salvage in a manner that would not preclude any future ecosystem-based management objectives. The anticipated impact of this project would not significantly change the landscape nor significantly affect future landscape analysis.

Except for large areas of fire salvage, the proposed harvest activities would be widely dispersed and discontinuous. Distances between areas of harvest would range from a few hundred feet to several miles. All of the harvest trees would be individually selected and primarily salvage. Implementation of the proposed alternative would enter less than four percent of the analysis area over the next five to ten years. Of the area entered, less than 20 percent would be detrimentally impacted.

In the event of a stand replacing fire, harvest activities and impacts would be similar to or less than those expected under a green timber sale. Skid trails and landings would be designated prior to yarding and located according to PDFs in Appendix A and BMPs in Appendix D of the KFRA ROD/RMP.

Canopy closure over the analysis area would not be significantly impacted by the harvest of dead and dying trees. Snag levels would be maintained above KFRA FEIS guidelines. No net increase in roads would occur. Impacts to watersheds would be low.

The proposed activities have been considered in association with existing timber harvest impacts and additional proposed harvest impacts. Any salvage sale volume would replace volume from planned green timber sales. This would result in a positive impact by postponing impacts on species that are normally impacted during harvest of density management (green tree) timber sales. The Allowable Sale Quantity would remain the same whether salvage was conducted or not.

The proposed activities have been analyzed collectively with all other proposed activities including harvesting, grazing, prescribed fire, and recreational use.

CHAPTER 5 – Monitoring

Monitoring is an important part of land management activities in the KFRA. Under this EA, monitoring would be implemented according to Appendix K of the KFRA ROD/RMP. In accordance with the monitoring section, at least 20 percent of all ground disturbing management actions would be examined prior to project initiation and re-examined following project completion. Monitoring related to salvage activities would include soil impacts, down woody debris retention, snag sizes and numbers, establishment and maintenance of buffers for RRs, T and E species, cultural resources, etc.

Two of the eight salvage sales conducted under the first Roaming Salvage EA were monitored. The Lower Spencer Salvage was a scattered mortality salvage harvested in 1997. It was monitored by a REO team in 1998 (REO 1998, Lower Spencer Salvage Monitoring Report). The Bull Springs Fire Salvage was a salvage harvest of a stand replacing wildfire. The fire burned in August of 2001 and the salvage occurred in the fall of 2001. It was monitored by a KFRA IDT in September of 2002 (USDI 2003, Bull Spring Fire Salvage Monitoring Report). Both monitoring reports are available at the KFRA in Klamath Falls, Oregon.

CHAPTER 6 – List of Preparers

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Grant Weidenbach	Recreation & Visual
Lou Whiteaker	Botanist - Noxious Weeds, and Special Status Plants

APPENDICES

APPENDIX A - Project Design Features

The project design features (PDFs) are specific measures included in the design of proposed projects to minimize adverse impacts to the natural and human environment. The PDFs for the proposed action were developed by members of an interdisciplinary team (IDT). Project Design Features that mitigate impacts to watersheds, wildlife, fisheries, and other resources are applied as described in the KFRA FEIS.

The PDFs listed below are common to all alternatives unless otherwise specified for both the east and west sides of the KFRA.

Timber Reserved From Cutting PDFs

All trees within the KFRA that do not meet the salvage definitions of dead, dying, damaged, or hazard trees under Alternative A of this EA.

All green trees except those meeting salvage and thinning criteria as described in Alternative A.

The BLM portion of the Fall Creek municipal watershed would be deferred from harvest until a watershed plan is completed by the City of Yreka, California and the Medford District BLM. (Explanatory note: the Fall Creek watershed supplies surface water to the city of Yreka, California's community water system. Approximately 100 acres in the extreme western portion of the KFRA are included within this municipal watershed).

On west side Matrix lands, wildlife trees would be reserved at an average of 2.5 trees per acre, with one tree per acre greater than 20 inches DBH (where available). Preferred large snag species would include ponderosa pine, sugar pine, and Douglas fir. The remaining 1.5 snags per acre would be greater than 12 inches DBH (if available) and would be of a species mix proportional to the stand. On average, snag height should be greater than 45 ft tall. Live culls, snap-outs, or other defective green trees could be counted as wildlife trees/snags. The ability to meet these requirements is based on the age class and development of the stand.

On eastside Matrix lands, snags would be reserved at an average of 1.4 per acre, 15 inches DBH and larger. The preferred snag species would be ponderosa pine. On average, snag height should be greater than 45 ft tall. Live culls, snap-outs, or other defective green trees could be counted as wildlife trees/snags. The ability to meet these requirements is based on the age class and development of the stand.

All identified wildlife trees/snags that are damaged or knocked down during logging operations would be reserved and would be left in the cutting area.

Buffers, referred to as Riparian Reserves (RRs), would be established adjacent to drainages, streams, water bodies, and wetlands. Special standards and guidelines would govern management activities in these areas. More information regarding harvest activities and management implications in RRs is available in the BMPs in Appendix F of the KFRA FEIS.

Riparian Reserve Management PDFs

Riparian Reserves would be designated according to the guidelines listed in the BMPs in Appendix F of the KFRA FEIS. Widths of RRs on lakes, reservoirs, and ponds would be measured from the historical high water marks. Widths of RRs on streams and drainages would be measured from high water and/or floodplain boundaries.

Some harvest may occur in the RRs as needed to meet ACS objectives. Harvest inside a RR would be conducted only with the concurrence of the KFRA Interdisciplinary Team.

All snags would be retained in RRs except where sufficient down woody debris are present or safety, fire hazard, or potential resource damage dictate their removal.

The 100 percent snag level requirements for wildlife would be met before any salvage is removed from a Riparian Reserve. The 100 percent levels include retention of at least 3.8 snags per acre on the west side and 2 snags per acre on the eastside. In addition, no salvage would be removed from a RR unless adequate down woody debris are present (see Down Woody Debris PDFs Appendix A). Hazard trees adjacent to roads or recreation sites, would be felled in RRs, including within the no cut buffer. Felled hazard trees would be left in the RRs except where adequate down woody debris exist or where they would create resource damage. Hazard trees felled within the no cut buffer would be left in place unbucked and unlimbed except where they would cause resource damage.

No salvage harvest would occur within the inner one-half of a given Riparian Reserve. No thinning would occur within 40 feet of perennial or fish-bearing streams or within 20 feet of intermittent streams. Generally, harvest/treatment methods that would disturb the least amount of soil and vegetation (yarding over snow or frozen ground, pulling line to each tree, minimizing skid trails) would be used in RRs.

No temporary or permanent roads would be constructed within Riparian Reserves.

Refueling, equipment maintenance, fuel storage, or other handling of petroleum products or chemicals in or adjacent to Riparian Reserves would not be permitted. One exception would be the application of borax to cut stumps in order to prevent the spread of root rot diseases.

No ripping, piling, or mechanical site preparation (except for designated skid trail crossings, landings, roads, or yarding corridors) would be permitted in Riparian Reserves, although riparian-wetland enhancement or wildlife projects could be allowed that consist of these types of activities in order to meet Aquatic Conservation Objectives of the Final Supplemental EIS.

Falling PDFs

Directional falling away from property lines, reserve trees, roads, streams, springs, meadows, cultural resource buffers, RRs, and fences would be required. In some instances, and with the concurrence of the KFRA Interdisciplinary Team, directional falling of trees toward streams and RRs may be required, in order to meet ACS objectives for in-stream large woody debris.

Log lengths would be restricted to 41 feet or less in areas where stand damage is occurring.

No limbing would be allowed except where large limbs are causing damage to the residual stand. Tops would remain attached to the last log.

Yarding PDFs

Whole tree yarding would be required in areas of ground based yarding, except where limbing and/or bucking is required to protect residual trees or where large cull logs are left for down woody debris purposes. Tops would remain attached to the last log and would be yarded to landings.

Cull logs greater than 12 inches in diameter at the small end that are not removed from the landing, would be yarded back into the sale area or to locations determined by a resource specialist.

Ground based logging equipment would be restricted to designated skid trails. Line pulling and winching

would be required.

All ground based yarding would take place on slopes averaging less than 35 percent.

No yarding would occur directly up or down any stream or drainage.

Designated crossings of RRs and the size of yarding corridors would be minimized.

No new landings would be located within RRs unless approved by the KFRA Interdisciplinary Team. Where possible, new landings would be located at least 50 feet from the outer edge of Riparian Reserves.

The maximum width of any yarding corridor through a RR would be 30 feet. No more than one yarding corridor per 200 linear feet of stream would be allowed.

No new skid trails would be located in RRs except at designated crossings. Required crossings would be designated prior to yarding by authorized personnel and would be at right angles to the drainage.

Avoid tractor yarding across fishery streams and associated Riparian Reserves. All skid trails that enter Riparian Reserves would be seeded with native species after use or prior to first rains, whichever comes first, or would be planted with conifers.

Install temporary stream crossings across Riparian Reserves of nonfishery streams prior to tractor yarding operations. Select stable, naturally armored areas. Minimize the area of disturbance. Use a culvert and clean rock or logs for temporary stream crossings. Install during low flows and remove prior to fall rains in the same season.

Logging on snow would be allowed in conformance with seasonal restrictions when snow depths average 20 inches or greater and negligible ground surface exposure occurs during the operation. Logging on frozen ground may also be allowed when the ground is frozen to a depth of at least 6 inches.

If a mechanical harvester is used on portions of the proposed harvest areas, the following restrictions would apply:

- operations would be restricted to dry conditions (generally less than 15 to 20 percent soil moisture by weight).
- the lowest ground pressure machine capable of meeting objectives would be used when available.
- no mechanical harvesting would be allowed on slopes averaging greater than 35 percent.

Seasonal Restrictions PDFs

Seasonal restrictions would be required to prevent soil erosion and to protect wildlife.

Seasonal restrictions would be required in areas where wildlife could be impacted, such as eagle nest sites, owl nest sites, and American marten den sites. Seasonal restrictions for specific species can be found on pages 2-31 to 2-40 of the KFRA FEIS.

To protect riparian areas, soil resources, and water quality while limiting erosion and sedimentation to nearby streams and drainages, logging operations would not be allowed during the wet season (October 15 to May 1). Logging activities would be permitted during this time period if frozen ground or sufficient snow is present, or as approved by a resource specialist.

To protect soil resources and water quality, unsurfaced roads would be closed to logging activities during the wet season (October 15 to May 1) unless waived by Authorized personnel.

Threatened and Endangered and Special Status Species Protection PDFs

If a threatened/endangered (T&E) species (plant/animal) is found prior to or during the timber sale, and the timber sale would subject the species of concern to adverse impacts greater than those analyzed in the FSEIS (NWFP) and the KFRA FEIS, all disturbing activity would cease and a Section 7 consultation would be held with the U.S. Fish & Wildlife Service. Harvest activity in the immediate vicinity of either plant or animal T&E species would be resumed only with the Field Manager's approval.

If other special status plant or wildlife species (federal candidate, state listed, state candidate, Bureau sensitive, or Bureau assessment species) are found within proposed project areas and would be subject to adverse impact, mitigation measures for those plant or wildlife populations would be proposed and submitted to the Field Manager for approval prior to continuing operations.

Visual Resources PDFs

Within recreation sites, concentrated recreation use areas, or Special Areas, the following design features would be implemented to reduce visual impacts from harvesting: Stumps would be cut close to ground (<4"); small (hand) piles of slash would be dispersed for firewood use; minimal use of tree marking paint would occur on trees identified for harvest; no large landings would be created, skid trails and ground disturbance would be kept to a minimum; damage to residual trees would be minimized through careful timber falling and yarding.

Cultural Resources PDFs

No salvage activities would occur in areas that have not been surveyed for cultural resources. Site specific buffers would be established around identified cultural resource sites and the sites and buffers would be avoided during harvest activities. Cultural protection and management procedures outlined in the KFRA ROD/RMP on page 43 would be followed.

If cultural materials are discovered during logging operations, all activity would cease and the KFRA archaeologist would be contacted to assess the importance of the area and whether or not it would require protection. Logging activities could only be resumed with area archaeologist and Field Managers' approval.

Road Construction PDFs

No new permanent roads would be constructed under this EA. Temporary spur roads may be required to access some of the salvage areas. All temporary road construction (including operator spurs and improvements) and renovation would be limited to the dry season (May 1 to Oct.15) or as determined by the authorized officer. Temporary roads would be decommissioned (put in erosion resistant condition, closed to vehicle traffic, and possibly planted) as soon as is practical following project activities (logging, site preparation, and planting) and, preferably, prior to onset of winter precipitation. No net increase of roads would occur.

Construction of temporary spur roads would be minimized in burned areas, and would only occur with the concurrence of the KFRA Interdisciplinary Team.

Road Maintenance PDFs

Where required, primary access roads would be maintained, renovated, or improved to facilitate general access. Some secondary roads would receive maintenance or improvement in areas of active erosion. Examples of improvements would include spot surfacing and installation of culverts or other drainage features where needed to protect resources. Other, more stable secondary roads, would receive minimal or no maintenance to provide high clearance vehicle recreation opportunities.

Road graders used for road construction or maintenance would grade towards any known noxious weed infestations. If no good turn-around areas exist within one half mile that would allow the operator to

grade towards the noxious weed infestation, then the operator would leave the material that is being moved within the boundaries of the noxious weed infestation. The grader would not grade through noxious weed infestations.

Road Use PDFs

Some roads, including spur roads causing resource damage and roads not needed for continued resource management, would be obliterated or closed after completion of the proposed salvage activities. Roads to be obliterated or closed would be identified by resource specialist and the KFRA Interdisciplinary Team (IDT) in individual decision records.

Currently closed roads, that would be opened to facilitate harvest activities, would be closed again after completion of those activities. The roads would be closed in a similar fashion to the currently existing closures.

Dust palliatives or surface stabilizers (water) would be used on roads during dry periods to prevent surface material loss and the buildup of fine sediments that may wash off into water courses. Application of dust palliatives and surface stabilizers, equipment cleanup, and disposal of excess materials would be closely controlled to prevent contamination of water resources.

Environmental Protection PDFs

Waterbars would be constructed on roads, spurs, skid roads, yarding corridors, and fire lines prior to fall rains. Waterbars would be constructed according to specifications outlined in the BMPs in Appendix F of the KFRA FEIS.

Where feasible and as designated by authorized personnel, spur roads, skid trails, and landings, that are not needed for as part of a permanent logging system, would be ripped to remove ruts, berms, and ditches and/or to reduce soil compaction.

During yarding and piling operations, practices and methods outlined in the BMPs in Appendix F of the KFRA FEIS would be adhered to.

The cumulative effects of unmitigated detrimental soil conditions would not exceed 20 percent of the total acreage within an activity area (the total area of ground, such as a timber sale unit or a slash treatment area including roads, skid trails, and landings). Detrimental soil conditions include compaction, displacement, and creation of adverse cover conditions. Sites where the 20 percent standard is exceeded would require treatment, such as ripping, backblading, and/or seeding.

When practical logging in burned areas would be delayed until litter fall from dead trees has occurred. This delay would allow accumulation of organic material that is beneficial for hillslope soil processes.

Noxious Weed Prevention PDFs

All vehicles and equipment will be cleaned off prior to operating on BLM lands. Removal of all dirt, grease, and plant parts that may carry noxious weed seeds or vegetative parts is required and may be accomplished with a pressure hose.

Noxious weeds in the immediate area of mechanical operations shall be mowed to ground level prior to the start of project activities except where snow logging is occurring.

All logging and construction equipment and vehicles would be cleaned off prior to leaving the job site when the job site includes a noxious weed infestation. Cleaning of equipment and vehicles prior to leaving the job site would not be required if the job site does not include any noxious weed populations. Removal of all dirt, grease, and plant parts that may carry noxious weed seeds or vegetative parts could be

accomplished by using a pressure hose. If cleaning is necessary, the cleaning area would be designated by authorized personnel.

Road graders used for road construction or maintenance would grade towards any known noxious weed infestations. If no good turn around area exists within one half mile that would allow the operator to grade towards the noxious weed infestation, then the operator would leave the material that is being moved within the boundaries of the noxious weed infestation.

Fire Prevention and Control PDFs

All contractors would be required to adhere to Oregon State fire safety and preparedness rules and regulations and Industrial Fire Precaution Class restrictions as directed by authorized personnel.

Slash Disposal PDFs

Where limbing occurs outside of landings, slash (limbs and tops) would be piled with a brush rake equipped tractor or skidder or hand piled. Where feasible the brush rake equipped tractor or skidder would make only one pass.

All slash within 100 feet of landings would be piled and burned.

All slash, in areas where piling is not required or not accomplished, would be lopped and scattered to a depth of twelve inches or less.

All burning would be done in accordance with standards established by the Oregon Smoke Management Plan.

Chipping and scattering of chips or removal of chips from the site would be an acceptable slash disposal method.

Some reserve trees, particularly high resource value trees, would have slash pulled back by hand and piled or lopped and scattered at least 20 feet away from the base of the tree.

In RRs, slash would be piled by hand. Excessive concentrations of logging slash in RRs, resulting from the current timber sale, would be removed prior to fall rains and placed above the high water mark.

Within 100 feet above culverts, all logging slash resulting from the current timber sale, would be removed and placed above the high water mark.

Soil moisture would be less than 15 to 20 percent before mechanical site prep activities, such as slash piling, would occur.

Follow-up underburning would be consistent with the Klamath Falls Resource Area Fire Management Environmental Assessment (EA#OR-014-94-09).

Woody Debris PDFs

Where practicable, ten tons or more of nine-inch diameter or smaller woody material per acre would be maintained. In ponderosa pine forest land, 9 tons per acre of duff and litter (approximately 0.5 inch deep) and 2.2 tons per acre of material 0.25 to 3 inches in diameter would be maintained. These target loads are designed to meet soil productivity and fire suppression objectives.

In higher elevation areas with windthrown trees, site specific areas would be identified to reserve some “jack-strawed” trees for wintering denning habitat for American Marten and other small mammals. Area biologists would identify such areas prior to harvest activities.

Eastside Coarse Woody Debris PDFs

Where available, fifty lineal feet of down logs with a 12 inch minimum diameter at the small end and greater than 8 feet in length would be reserved per acre to meet eastside CWD requirements.

Westside Coarse Woody Debris PDFs

Where available, 120 lineal feet of down logs with a 16 inch minimum diameter at the small end and greater than 16 feet in length would be reserved per acre to meet westside CWD requirements.

During fire salvage operations, leave standing trees (live or dead) to meet the CWD and snag requirements (as analyzed in the KFRA FEIS) appropriate for that site.

PDFs Specific to Suckers and East-side Trout Streams

Endangered Suckers and depressed populations of redband trout require special attention because of their vulnerability to sedimentation. The following PDFs are designed to protect east side RRs, streams, and the wildlife that inhabit them.

1. Logging equipment would cross ephemeral channels only where adequate armoring is present or artificial armoring would be provided if necessary. Examples of artificial armoring would be large logs or rocks.
2. No removal of trees within 15 feet of ephemeral streams that are within 1/4 mile of an intermittent or perennial stream.
3. Do not use roads which have inadequate drainage features unless all potential problems can be corrected before the wet season. These roads would have prior evidence of erosion or rutting.
4. Review stream and riparian assessments to determine which sucker and trout streams are non-functional or functional at risk. No harvest activity would occur upstream of these areas until a site inspection is made to ensure that no impacts occur that would contribute to existing problems.

Great Gray Owl Habitat Requirements PDFs

Where habitat is found to be occupied by the great gray owls or in forested areas adjacent to meadows or natural openings ten acres or larger, it is recommended the following characteristics be maintained in an area determined by the biologist to be the nest stand:

- Retain leaning trees;
- Retain 4 to 5 of the largest (≥ 24 " dbh) snags or green snap-outs greater than 50 feet tall per acre in the stand;
- Retain known and potential nest trees;
- for occupied nest territories, provide up to 1/4 mile buffer during nesting season (March 1 through August 31).

APPENDIX B - Literature Cited

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