

**CHEW TIMBER SALE
ENVIRONMENTAL ASSESSMENT
EA# OR-014-05-03**

**UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
LAKEVIEW DISTRICT - Klamath Falls Resource Area**

ABSTRACT: The following Environmental Assessment addresses the environmental effects associated with a variety of proposed treatments from the Chew Timber Sale. Proposed treatments include; commercial timber harvesting, road improvements, riparian habitat restoration, and fuels treatments.

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INTERESTS: The Bureau of Land Management is soliciting comments on this Environmental Assessment. Comments, including names and street addresses of respondents, will be available for public review at the above address during regular business hours. Individual respondents may request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for public inspection in their entirety.

Table of Contents

CHAPTER 1 - INTRODUCTION	1
Proposed Action	1
Location	1
Purpose and Need for Action	3
Purpose	3
Needs	3
Desired Future Condition and RMP Objectives	3
Matrix Forest Stands	3
Riparian Reserves	4
Roads	4
Environmental Analysis and Decision Process	4
Public Input Summary and Issue Development	5
Management Direction and Conformance with Existing Plans	5
CHAPTER 2 - PROPOSED ACTION AND ALTERNATIVES	6
Proposed Action	6
Westside Matrix Forest Lands	6
Riparian Reserve	6
Volume Harvested	6
Fuels Treatment	6
Roads and Transportation System	6
No Action Alternative	7
Other Alternatives Considered But Dropped From Analysis	8
Salvage Only Alternative	8
Restoration Treatments Only Alternative	8
CHAPTER 3 – AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES	9
Introduction	9
Project/Analysis Area(s)	9
Design of This Chapter	9
Cumulative Actions Considered	9
Vegetation - Affected Environment	10
Upland Forest	10
Special Status Species	11
Noxious Weeds	12
Vegetation - Environmental Consequences	12
Upland Forest	12
Special Status Species	14
Noxious Weeds	15
Terrestrial Wildlife Species – Affected Environment	16
Threatened and Endangered Species	16
Special Status Species (Bureau Sensitive and Bureau Assessment)	17
Other Species	18
Terrestrial Wildlife Species – Environmental Consequences	19
Threatened and Endangered Species	19
Special Status Species	21
Soils - Affected Environment	22
Soils - Environmental Consequences	22
Roads - Affected Environment	23
Roads - Environmental Consequences	24

Hydrology - Affected Environment	24
Hydrology - Environmental Consequences	25
Aquatic Wildlife Species – Affected Environment.....	26
Aquatic Wildlife Species – Environmental Consequences	27
Grazing Management - Affected Environment.....	27
Livestock.....	27
Wild Horses	28
Grazing Management - Environmental Consequences	28
Livestock and Wild Horses	28
Cultural Resources - Affected Environment.....	29
Cultural Resources - Environmental Consequences	29
Recreation Resources - Affected Environment.....	29
Recreation Resources - Environmental Consequences	30
Visual Resources - Affected Environment.....	30
Visual Resources - Environmental Consequences.....	31
Socioeconomics – Affected Environment.....	31
Socioeconomics – Environmental Consequences.....	31
 CHAPTER 4 – CONSULTATION.....	 33
Endangered Species Act Consultation	33
 CHAPTER 5 – LIST OF PREPARERS	 33
 Appendix A – Bibliography.....	 34
 Appendix B – Summary of Best Management Practices and Project Design Features	 36
Upland Forest Vegetation - Harvest Prescription	36
Roads	37
Soil Resources.....	37
Hydrology & Riparian Reserve Treatments.....	38
Wildlife Terrestrial Species	40
Noxious Weeds	41
Special Status Species.....	41
Cultural Resources	42
Visual Resources.....	42
Recreation Resources.....	42
 Appendix C – Project Maps.....	 43

List of Tables

<i>Table 1 – Location of BLM-administered Lands within the Analysis Area.....</i>	<i>1</i>
<i>Table 2 – Detailed Description of the Proposed Action.....</i>	<i>7</i>
<i>Table 3 – Additional Treatments Currently Proposed on BLM lands.....</i>	<i>10</i>
<i>Table 4 – Special Status nonvascular plant species that could occur in the project area.....</i>	<i>11</i>
<i>Table 5 – ESA Listed, Proposed and Candidate Terrestrial Wildlife Species.....</i>	<i>17</i>
<i>Table 6 – Soil Types, Slopes, and Acres for BLM and Private Land within the Analysis Area.....</i>	<i>22</i>
<i>Table 7 - Road Density in Chew Timber Sale Project Area (BLM ownership).....</i>	<i>24</i>

List of Figures

<i>Figure 1 – Location Map.....</i>	<i>2</i>
<i>Figure 2 - Trees per Acre by Species in the Chew Timber Sale Project Area.....</i>	<i>11</i>
<i>Figure 3 – Take versus Leave Trees per Acre for the Chew Timber Sale Project Area.....</i>	<i>13</i>
<i>Map 1 – Fifth Field Watershed Scale.....</i>	<i>43</i>
<i>Map 2 – Roads and Streams.....</i>	<i>44</i>

CHAPTER 1 - INTRODUCTION

The Klamath Falls Resource Area Resource Management Plan (RMP) provides direction for managing lands on the western part of the Lakeview District. The Chew Timber Sale environmental assessment (EA) will analyze the effects from proposed vegetation treatments and other management actions in and adjacent to the Chew Timber Sale project area on Bureau of Land Management (BLM) lands shown in Table 1 and the Location Map (Figure 1). Many of the stands in the proposed Chew Timber Sale area are multi-aged, multiple canopy stands. Many stands proposed for treatment have a residual large tree overstory component of ponderosa pine, sugar pine, Douglas-fir, incense cedar and white fir and a dense understory component. Past management practices in the area have included timber harvesting, suppression of natural fires, grazing, and recreation.

Proposed Action

The following activities are included in the Proposed Action (see Chapter 2 for a detailed description):

Commercial Timber Harvest within the Matrix Land Allocation with the Silvicultural Prescription of:

- Density Management - Approximately 1,130 acres
- Regeneration Harvest - Approximately 40 acres

Fuel Reduction (Post Harvest) in the Matrix through the following methods:

- Slash Busting - Approximately 1,200* acres
- Prescribed Fire – Light Intensity Underburn, - Approximately 1,200* acres

Riparian Reserve Vegetation Treatments with Silvicultural Prescription applied:

- Density Management (thinning) - Approximately 15 acres

Fuel Reduction (Post Harvest) in Riparian Reserves through the following methods:

- Slash Busting - Approximately 15* acres
- Prescribed Fire – Light Intensity Underburn, - Approximately 15* acres

Road Treatments

- Road improvement (resurfacing) - Approximately 1.5 miles
- Renovation (grading & brushing – road maintenance) - Approximately 15 miles
- Road closures (Blocking) - Approximately 2 miles of roads

(*Note: these are the same acres treated with timber harvest)

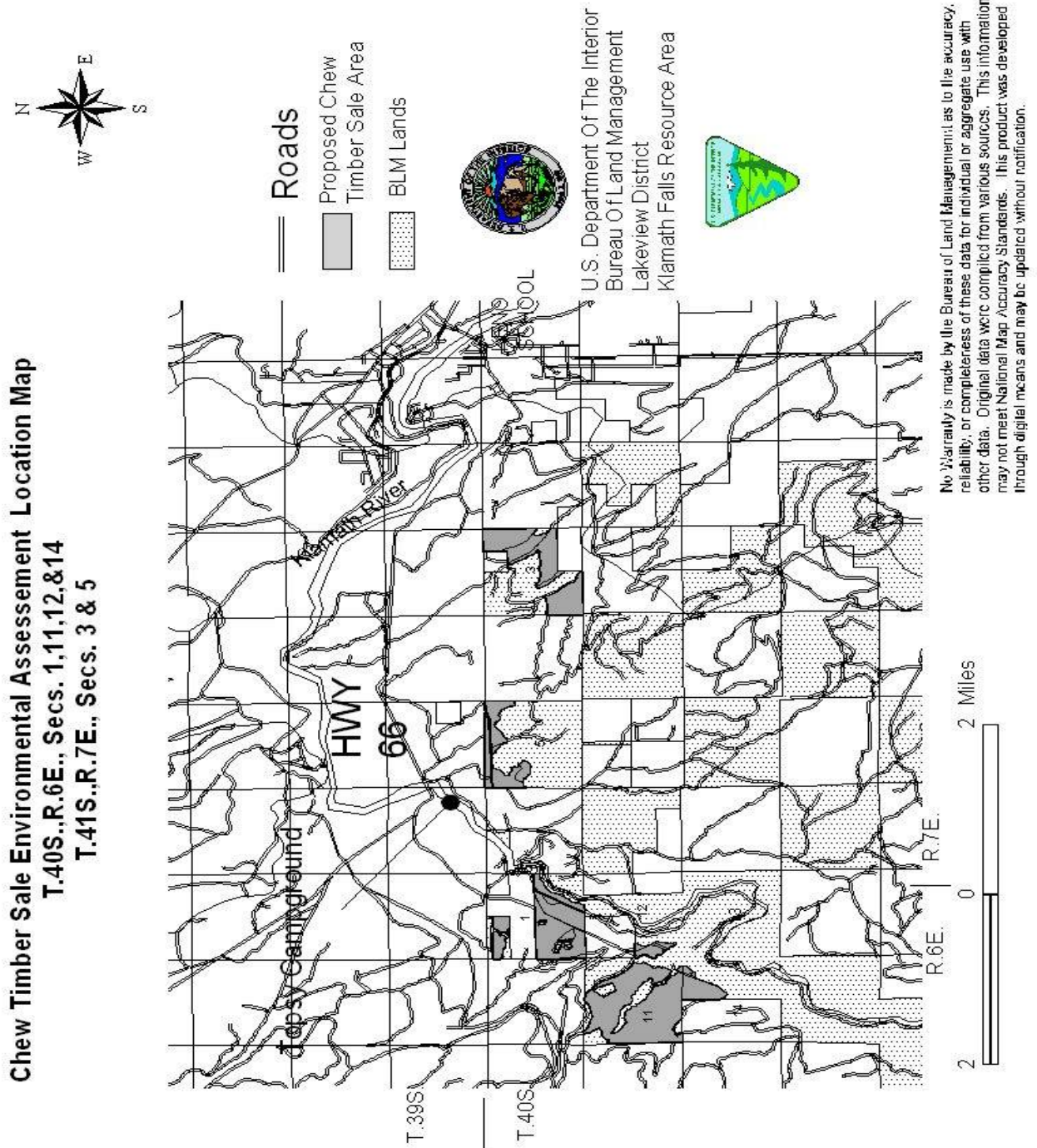
Location

The proposed Project area is located south of State Highway 66 and west of the town of Keno (refer to Table 1 below and Figure 1 – Location Map) All treatments proposed in this environmental assessment would occur exclusively on BLM-administered lands within the Klamath Fall Resource Area.

Table 1 – Location of BLM-administered Lands within the Analysis Area

Proposed Treatment Area	Location		
	Township	Range	Section
Chew Timber Sale	40S.	6E.	1,11,12,14
	40S.	7E.	3, 5

Figure 1 – Location Map



Purpose and Need for Action

Purpose

- Implement actions to meet the objectives of the RMP (discussed below).
- Achieve the desired future condition (discussed below).
- Improve the resiliency of residual trees from drought, insect, and disease.
- Produce a sustainable supply of timber and other forest commodities to support local and regional timber-related businesses.
- Reduce the fuels hazards associated with high fuel loading and overstocking that makes these stands vulnerable to stand replacing wildfires.
- Improve riparian conditions.
- Reduce road density in the area while improving the condition of the remaining transportation system.

Needs

- Field observations and timber stand data show that the existing stands in the proposed project area are presently overstocked, with declining forest health (stand resiliency) and reduced annual growth. Some stands are already infected by insects and disease and need to be treated to stop the spread and decrease the loss of timber. (Note: Forest health in this EA is defined as the resiliency of the forest ecosystems to sustain themselves in the process of natural disturbances such as insect outbreaks and wildfires. A more detailed discussion of forest health is in the Topsy/Pokegama Landscape Analysis (TPLA) (1996), pages 17-35, and in the KFRA 1994 FEIS, pages 3-63 to 3-66.) Trees within densely stocked stands are more subject to stress and vulnerable to further attack by insects and diseases. There is a need to reduce the stocking to improve growing conditions (reduced competition for water, nutrients and light) and increase the vigor of the remaining trees on approximately 1,200 acres of dense, overstocked forested stands in the proposed area.
- The RMP has allocated the lands being analyzed to Matrix and Riparian Reserves. The Matrix lands have RMP objectives to produce a sustainable supply of timber and other forest commodities as stated in the KFRA RMP and O&C Act of 1937, which can be met by removing trees under commercial contract. Approximately 3 million board feet of timber would be harvested and sold.
- There is a need to thin timbered stands to reduce fire hazard. Overstocked stands have more surface, ladder and canopy fuels that result in a higher fire hazard in some forested areas.
- Riparian reserves are also densely stocked and vulnerable to stand replacing wildfires. These stands need to be improved to enhance riparian function and hydrologic conditions and reduce fire hazard.
- Road density is 6.4 miles/square mile which exceeds the RMP objective. There is a need to reduce the road density in order to benefit wildlife and hydrologic function.

Desired Future Condition and RMP Objectives

Matrix Forest Stands

For Matrix forest stands, the RMP explains in detail the desired future condition and objectives of forested stands in the Matrix (See page 22 and pages E-8 to E-11). In general, the desired future condition of the Matrix forest landscape is a healthy, diverse, and productive forest that is resilient to natural disturbances (disease, drought, insects, and fire) and meets the following objectives:

- Produce a sustainable supply of timber and other forest commodities to provide jobs and contribute to community stability (RMP page 22).
- Provide connectivity (along with other allocations such as Riparian Reserves) across the landscape for forest dependent plant and animal species (RMP page 22).

- Provide habitat for a variety of organisms associated with both late-successional and younger forests (RMP page 22).
- Provide for important ecological functions such as dispersal of organisms, carryover of some species from one stand to the next, and maintenance of ecologically valuable structural components such as down logs, snags, and large trees (RMP page 22).

Page E-9 of the RMP discusses target stand conditions that over time would trend towards a forest composed of stands containing a variety of structure, trees of varying sizes and ages, and stands with an assortment of canopy configurations. Desired Species Composition (by percent conifer basal area), shown on Table E-1 of the RMP, is designed to improve stand resiliency. The Chew Timber Sale silvicultural prescription was developed to meet these desired future conditions as indicated in Figures 2 and 3.

Riparian Reserves

In general, the desired future condition of riparian reserves is proper functioning condition of riparian areas (streams, wetlands, etc.) and healthy upland vegetation which contributes to meeting the following objectives:

- the Aquatic Conservation Strategies listed on page D-6 of the RMP
- reduced risk of future high intensity fires as well as insect infestations
- reduced sediment input to streams from natural disturbances and management actions

Roads

The RMP (pages D-13 to D-21) lists the desired future conditions and objectives for managing roads in the KFRA. The desired future condition for roads in the analysis area is a transportation system that meets the following objectives:

- provide suitable transportation facilities for management and recreational use
- ensure that the road investment is maintained and that roads and road use are not contributing to resource damage
- reduce road densities where feasible

Environmental Analysis and Decision Process

An interdisciplinary evaluation of the resources in the analysis area including wildlife, recreation, soils, fisheries, timber, cultural, hydrology, as well as other resources will be documented as part of this environmental assessment (EA). The analysis is accomplished by examining the different resources in the analysis area and recommending a course of action that best meets the objectives outlined in the Klamath Falls Resource Area (KFRA) Resource Management Plan (RMP).

This Environmental Assessment (EA) is tiered to the Final - Klamath Falls Resource Area Resource Management Plan and Environmental Impact Statement, September 1994 (KFRA RMP EIS). The purpose of this EA is to assess the effects of the proposed treatments and to determine if the environmental effects associated with the proposed site-specific treatments are significant and/or greater than those already analyzed in the previous KFRA RMP EIS. If the effects are not significant or greater than analyzed in the KFRA RMP EIS, a Finding of No Significant Impact (FONSI) will be documented upon the completion of the analysis. In addition to providing analysis to determine whether or not an environmental impact statement is necessary, this EA will provide the public with information about the proposed treatments, describe the alternatives and the associated effects with each alternative, and assist the decision maker in selecting an alternative.

The KFRA Field Manager, as the responsible official, will decide whether or not to implement the Proposed Action and determine whether or not the proposed action is consistent with the RMP as well as other laws and regulations (i.e., the Endangered Species Act and Clean Water Act, etc.). The proposed

treatments or projects would span a 3-5 year period. Information obtained from biological surveys and consultation is included in the EA and will also be incorporated in the final Decision Record to this EA.

Public Input Summary and Issue Development

A scoping letter dated April 22, 2005, was sent to the resource area timber sale EA mailing list of approximately 130 people. The letter explained the Chew Timber Sale project proposal and asked the general public for comments. The resource area received comments from two organizations. The issues and concerns raised were considered in formulation of alternatives (Chapter 2) and the analysis (Chapter 3) and are briefly summarized below by the different resources:

Roads – Construct no new roads including temporary roads.

Soils – Avoid soil impacts associated with logging and roads.

Protection of Large Trees / Old Growth – Avoid impacts associated with cutting large trees and old growth to wildlife, fuel loadings, and other ecological functions. Implement diameter limits and retain trees over 12” DBH. Thinning should be done at variable densities and carefully.

NEPA – Ensure meaningful public participation, a full range of alternatives, rational and informed decision making, and adequate funding.

Wildlife – Ensure adequate surveys are completed and environmental impacts area analyzed.

Water Quality – Assess impacts of actions on water quality and Aquatic Conservation Strategies objectives.

Fire and Fuels – Thinning, large tree removal, and fuels reduction objectives are interrelated. Prioritize treatment areas with community zones receiving the highest priority. Analyze proposed treatments to determine effectiveness and if proposed treatments including harvesting will actually increase wildfire severity and risks.

Management Direction and Conformance with Existing Plans

This Environmental Assessment (EA) is tiered to the Klamath Falls Resource Area Resource Management Plan and Final Environmental Impact Statement (RMP/FEIS, September 1994) and Record of Decision (ROD, June 2, 1995). Management direction and recommendations for project design and implementation is contained in the RMP and a number of supporting documents listed below:

- Klamath Falls Resource Area Integrated Weed Control Plan EA (July 21, 1993).
- Range Reform FEIS (August 1995).
- Final Environmental Impact Statement, Vegetation Treatment on BLM Lands in Thirteen Western States (1991).
- Aquatic Conservation Strategy Supplemental Environmental Impact Statement/Record of Decision 2004 (ACS SEIS EIS/ROD – 2004)
- Final Supplemental Environmental Impact Statement To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines (2004).
- The Topsy/Pokegama Landscape Analysis (TPLA) - Completed in July of 1996 provides both historic and current information on the different resources in the watershed and also provides a number of recommendations for resource protection and restoration opportunities.

CHAPTER 2 - PROPOSED ACTION AND ALTERNATIVES

There are two alternatives analyzed in this environmental assessment. Below is a description of each alternative.

Proposed Action

The Proposed Action is designed to meet the purpose and need of the EA by improving the health of forested stands and reduce fuel hazard conditions. Table 2 shows the specific design of the Proposed Action. A description of these actions is as follows:

Westside Matrix Forest Lands

Density Management

Density Management (thinning) would occur on approximately 1,130 acres of westside matrix lands. This type of harvest would be designed to maintain an uneven-aged, multi-strata stand structure and reduce competition and stress to remaining trees (RMP/ROD, Page 56). Generally, 80-140 square feet of basal area per acre will be retained in the Density Management Units. Figures 2 and 3 show the approximate diameter distribution of trees scheduled for harvesting and retention. Approximately 2.4 snags per acre will be retained with a minimum diameter at breast height (DBH) of 16", or largest available if less than 16" (RMP/ROD, Page 26-27). Approximately one hundred and twenty (120) linear feet of down logs per acre will be retained. Logs shall be greater than or equal to sixteen (16) inches in diameter and sixteen (16) feet long (RMP/ROD, Page 22).

Regeneration Harvest

Regeneration harvest would occur on approximately 40 acres of westside matrix lands. This harvest is located in a large area infected with laminated root rot (*Phellinus weirii*). The harvest is designed to remove the susceptible species (Douglas-fir and white fir) and retain the more resistant species. Approximately 16-25 large green trees per acre will be retained in the regeneration unit (RMP/ROD, Page 23). Approximately 2.4 snags per acre will be retained with a minimum diameter at breast height (DBH) of 16", or largest available if less than 16" (RMP/ROD, Page 26-27). Approximately one hundred and twenty (120) linear feet of down logs per acre will be retained. Logs shall be greater than or equal to sixteen (16) inches in diameter and sixteen (16) feet long (RMP/ROD, Page 22).

Riparian Reserve

Approximately 15 acres of commercial Density Management (thinning) would occur in riparian reserves. Cutting would be done by hand and/or mechanically. The objective is to reduce the stand density in the Riparian Reserve and improve the resiliency of the remaining trees. The residual debris would be slashbusted, hand piled and burned, or underburned with a light intensity prescribe fire.

Volume Harvested

In the Matrix, approximately 2.9 million board feet (2.90MMBF) of timber would be harvested in the proposed sale area. In the Riparian Reserve, approximately 15 thousand board feet (0.015MMBF) of timber would be harvested. Appendix B of this EA includes the harvest prescription, project design features, and best management practices for treatment of forested areas.

Fuels Treatment

Upon completion of harvesting, approximately 1,200 acres would be slash busted and receive a light intensity underburn to further reduce fuel hazards. This treatment will occur in both the Matrix and Riparian Reserve allocations.

Roads and Transportation System

- Approximately 1.5 miles of road would receive additional surface rock (road improvement).

- Approximately 15 miles of road would be brushed, graded and the ditches and culverts cleaned (road renovation).
- Approximately 9 year-around road blocks would be installed on spur roads to reduce open road by two miles.
- The Pokegama road seasonal road closure from November 20th to March 31st would continue. (Refer to Table 2.)

Table 2 – Detailed Description of the Proposed Action

Project Element	Units Proposed
Westside Matrix Forest Lands	
Total Amount Of Commercial Timber Harvest	Approximately 1,200 acres
Silvicultural Prescription DM=Density Management RH=Regeneration Harvest	DM – Approximately 1,130 acres RH – Approximately 40 acres
Fuel Reduction (Post Harvest) Slash Busting Prescribed Fire – Light Intensity Underburn	Approximately 1,200 acres Approximately 1,200 acres
Riparian Reserves	
Density Management (thinning)	Approximately 15 acres
Road Treatments and Transportation Management	
Road improvement (resurfacing)	Approximately 1.5 miles
Renovation (grading & brushing – road maintenance)	Approximately 15 miles
Road closures (Blocking)	Approximately 2 miles of roads
Maintain existing Pokegama Road Closure from November 20 th – March 31 st .	As existing
Volume	
Density Management (thinning)	Approximately 2.6MMBF
Regeneration Harvest	Approximately 0.250MMBF
Riparian Reserve Harvest	Approximately 0.015MMBF

Best Management Practices (BMPs) described in Appendix D of the RMP and additional Project Design Features (PDFs) specific to the above described activities listed in Appendix B of this analysis will be implemented as part of the Proposed Action. Both the BMPs and PDFs are designed to minimize adverse effect on the natural and human environment, including: vegetation, soils, roads, wildlife, hydrology, cultural, visual, and recreation resources.

No Action Alternative

The National Environmental Policy Act (NEPA) requires analysis of a No Action alternative. This alternative proposes no new management activities in the project area. Activities proposed in and adjacent to the analysis area and analyzed in other NEPA documents would still occur such as fuel reduction treatments, routine road maintenance, Pokegama seasonal road closure, forest inventory and surveys, and fire suppression. The selection of the No Action alternative would not change land allocations or the direction that the BLM has to manage these lands as Matrix. These lands will likely be considered for similar management in the future with or without the current proposed action.

Other Alternatives Considered But Dropped From Analysis

Salvage Only Alternative

An alternative was considered that would have analyzed for Salvage Harvest Only in the proposed project area. This would involve the harvesting and removal of only scattered dead and dying trees throughout the Chew timber sale area. Salvage is discussed in the RMP (pages 55 and E-4). Annual mortality and blowdown in the resource area has occurred since initiation of the RMP in June of 1995. Moderate amounts of mortality are anticipated to continue, especially in white fir from *Scolytus ventralis* (fir engraver beetle). A portion of the Allowable Sale Quantity has come from the salvage of dead and dying trees on almost a yearly basis. A separate EA (Roaming Salvage II EA – OR014- 03-06) has been prepared to analyze the impacts of continuing to salvage scattered dead and dying trees from the entire Resource Area, including the proposed project area. Therefore, this alternative was dropped from further consideration.

Restoration Treatments Only Alternative

Another alternative considered was one that considers effects of implementing only the restoration treatments from the Proposed Action, primarily hazardous fuel reduction treatments (slashbusting and underburning) in the Matrix and Riparian Reserves with no commercial harvest. This alternative was dropped from further analysis based on the understanding that environmental effects of implementing restoration treatments will be sufficiently discussed in the Proposed Action. Additionally, the determination was made that a “Restoration Treatments Only” alternative would not fully meet the land use plan objectives or the purposes and needs for the proposed action.

CHAPTER 3 – AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES

Introduction

This chapter summarizes the physical, biological, and socioeconomic environment of the Chew Timber Sale area and the consequences of the proposed actions. A detailed discussion on the affected environment and environmental consequences can also be found in the Klamath Falls Resource Area RMP/ROD and FEIS (pages 3-3 to 3-79) and the Topsy/Pokegama Landscape Analysis (pg 13 - 200). The affected environment reflects the existing condition that has developed from all past natural events and management actions within the project area (and/or 5th field watershed). It is a combination of natural and human caused fires, fire suppression, road building, timber harvesting, grazing, fuel reduction treatments, and the effects of recreational use. The current condition assessed for each affected resource is a result of all past natural events and management actions. It is therefore unnecessary to individually catalog all past actions in this EA. Such detail would be irrelevant to making a rational decision among alternatives. The important value of this EA is to assess and display for the deciding official the impacts of the alternatives on those resources as they exist today, to allow a determination if the resulting project effects and/or cumulative effects are either significant or are greater than those analyzed in the RMP EIS.

Resource values that are either not present in the project area, or would not be affected by any of the proposed alternatives are: floodplains, wilderness study areas (WSAs), areas of critical environmental concern (ACECs), research natural areas (RNAs), paleontological resources, prime or unique farmlands, wild and scenic rivers, lands, aquatic species, air quality, and minerals. There are no known hazardous waste sites in the analysis area. For either alternative, no direct or indirect disproportionately high or adverse human health or environmental effects to minority or low income populations are expected to result from implementation of the proposed action or the alternatives.

Project/Analysis Area(s)

This section is to clarify the Project Area and the different landscape scales that were used for analysis. The Project Area is the actual boundary of the treatment area. For a timber sale, it is the cutting unit boundary as shown on the Location Map (Figure 1). In describing the affected environment and environmental consequences, analysis was generally discussed at two different landscape scales. One scale, most frequently referred to as the analysis area, is the environment within or adjacent to the immediate vicinity of the Project Area. The other scale that is often used is the 5th field watershed scale (Map 1 in Appendix C). This includes all lands, private and agency lands, that fall within a 5th field watershed. When describing cumulative impacts to hydrology, vegetation, and wildlife, the 5th field watershed scale is often used.

Design of This Chapter

This Chapter is designed to first describe the affected environment of a particular resource in its existing condition. There is then a discussion on the Environmental Consequences of each alternative. The No Action alternative is discussed first and includes a discussion of cumulative impacts anticipated regardless of implementing the Chew timber sale and fuel reduction treatments. A number of other treatments are proposed in the 5th field watershed and are analyzed as part of the impacts.

Cumulative Actions Considered

Timber management in the last decade on BLM land has included approximately 4,200 acres of thinning in the watershed. Stands throughout the Matrix allocation are expected to be selectively harvested approximately every 20-30 years, according to Klamath Falls Resource Area plans. Current timber management on the surrounding private land is more intensive and occurs on a larger scale. This management regime is expected to continue in the future. On many private lands, it is anticipated that

residual vegetation will be reflective of early seral conditions and will meet pertinent state laws governing forest management practices.

Table 3 lists treatments proposed for the foreseeable future on BLM lands in the watershed that will be considered in the following resource-specific cumulative impact discussions.

Table 3 – Additional Treatments Currently Proposed on BLM lands within the Klamath River-John C Boyle 5th Field Watershed

Treatment	Approximate Volume	Approximate Acres	Anticipated Year
Walters Cabin Timber Sale	1.5MMBF	700	2006
Gerber Stew Stewardship Thinning	0.500MMBF	800	2005, 2006, 2007
Slashbusting	None	800	2005, 2006, 2007

Vegetation - Affected Environment

Upland Forest

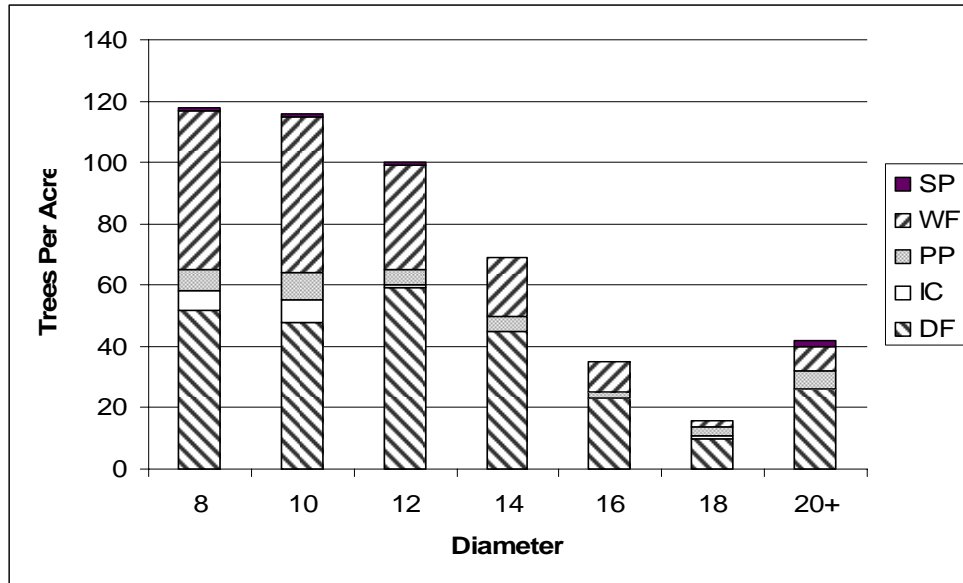
Forests occurring in the proposed treatment area can be generally described as multi-aged, multiple canopy forested stands of ponderosa pine, Douglas-fir, sugar pine, incense cedar, and white fir. Many of the stands have been selectively cut in the past leaving an array of trees sizes and ages. Tree sizes range from 1”DBH to over 30”DBH. Tree ages range from 1 to over 200 years old. Figure 2 shows the diameter distribution and species composition of some of the stands. From the 1950’s through the 1990’s, most of these stands were entered once or more for selective thinning and overstory removals. There are some stands within the project area where most of the larger and older overstory trees have been harvested and the residual stands consist primarily of dense stands of small pole-sized and second growth timber ranging in diameter from 8”- 20” in diameter.

All lands with the proposed project area have been classified as being in Fire Regime 1, Condition Class III. Forested areas within this condition are classified as most vulnerable to severe effects from wildfire. The primary stand characteristics for this classification are the high existing fuel loads and densely stocked trees. Over some of the project area (Section 3 & 5), at least one entry of prescribed fire (underburning) has been implemented to reintroduce fire into the ecosystem and to reduce fuel loads. Additional light intensity underburn treatments would be beneficial. In addition to the fire risk, existing overcrowded stand conditions and competition for limited moisture continues to affect the individual tree resiliency in these stands. Crowded growing conditions stress the trees, suppress growth, and increase vulnerability to insect mortality.

Present in the forested stands of the proposed project areas are the western pine beetle and fir engraver beetle that can infest and kill different species of pine and white fir trees. Small (less than one acre) patches of ponderosa pine have been killed and are currently being attacked by bark beetles. In addition, on-going mortality from fir engraver beetles throughout all white fir stands is occurring.

Plant communities in the EA analysis area are generally within those plant associations described by Hopkins (1979) for the Klamath Ranger District, Winema National Forest or by Atzet and McCrimmon (1990) for the Southern Oregon Cascade Mountain Province. For a complete list of these plant associations, along with a detailed description of other plant communities within the EA analysis area, reference pages 55-59 in the TPLA.

Figure 2 – Trees per Acre by Species in the Chew Timber Sale Project Area



DF = Douglas-fir, WF = White fir, PP = Ponderosa pine, IC = Incense Cedar, SP = Sugar Pine

Special Status Species

Vascular Plants

The proposed timber sale area was surveyed for botanical resources in 1996 (Sections 11 and 14), 1998 (Sections 3 and 5) and 2002 (Section 1). No populations of special status plant species were found within the any of the proposed timber sale units.

Nonvascular Plants

Surveys are not required for nonvascular cryptogams on the Klamath Falls Resource area. However surveys were done in and around the project area under the former Survey and Manage guidelines. No Special Status nonvascular cryptogams were found.

Table 4 lists special status nonvascular plant species that are documented or suspected in the resource area. The range and habitat of these species is not well known. Extensive surveys under the former Survey and Manage program identified some habitat requirements for some of these species. Management of known sites, conservation assessment plans and ongoing data collection will help better identify potential habitat.

Table 4 – Special Status nonvascular plant species that could occur in the project area

Taxa	Species	Special Status Category	Suspected or Documented
BR	<i>Calliargon trifarium</i>	BAO	S
BR	<i>Chiloscyphus gemmiparus</i>	BSO	S
BR	<i>Helodium blandowii</i>	BAO	S
BR	<i>Meesia uliginosa</i>	BAO	S
BR	<i>Splachnum ampullaceum</i>	BAO	S
BR	<i>Tripterocladium leucocladulum</i>	BAO	S
BR	<i>Tritomaria exsectiformis</i>	BAO	S
FU	<i>Boletus pulcherrimus</i>	BSO	D
FU	<i>Rhizopogon ellipsosporus</i>	BSO	S
LI	<i>Texosporium sancti-jacobi</i>	BAO	S

BAO (Bureau Assessment-Oregon), BSO (Bureau Sensitive-Oregon)

Noxious Weeds

The proposed timber sale area was surveyed for botanical resources in 1996 (Sections 11 and 14), 1998 (Sections 3 and 5) and 2002 (Section 1). Sections 3 and 5 were again surveyed for noxious weeds in 2002 by the Oregon Department of Agriculture. Noxious weed populations were found in all areas that were surveyed.

- Section 3 of the proposed timber sale contains extensive populations of diffuse knapweed (*Centaurea diffusa*). Infestations are distributed primarily along roadsides, and are particularly abundant at intersections of more than one road.
- Section 5 of the proposed timber sale contains four populations of diffuse knapweed. Three of these populations are along the powerline corridor in the extreme northern part of the section. One infestation occurs along the roadside in the NW quarter of the NE quarter of the section.
- Section 1 of the proposed timber sale contains infestations of St. John's wort (*Hypericum perforatum*), dyer's woad (*Isatis tinctoria*) and diffuse knapweed. One population of the St. John's wort occurs along the riparian area in the NW quarter of the section, just outside the timber sale unit. St. John's wort also occurs along a large portion of the road in the northern part of the SW quarter, where it is mixed with dyer's woad in a portion of that area. The single diffuse knapweed infestation occurs in about the center of the SW quarter within the timber sale unit.
- Section 11 of the proposed timber sale area contains a population of St. John's wort that is distributed along an extensive section of the Ward Road in the northern half of the section.
- Section 14 of the proposed timber sale has no known noxious weed populations within the Project Area. However, yellow starthistle (*Centaurea solstitialis*) occurs within the section near the rim of the Klamath River Canyon.

Although these weed populations are on the annual operations plan for treatment, no single treatment is 100% successful, seeds in the soil will continue to germinate for several years, and sources of seeds occur on adjoining ownerships. Therefore, these populations should be considered to be part of the existing situation.

Vegetation - Environmental Consequences

Upland Forest

No Action

This alternative would result in no immediate timber harvesting in the Project Area, although other timber harvests are proposed in the 5th field watershed in 2006-2008 (Table 3). An EA (#OR-014-02-03) was completed in 2002 which analyzed the effects of fuel treatments on the westside (including the project area). A combination of slash busting and prescribed burning would likely occur in the project area within the next five (5) years, resulting in some fuel reduction. However, overstocked trees in the 8 to 20 inch diameter range (Figure 3) are too large for slashbusting and are not consumed in a low-intensity underburn prescription. Fire intensity sufficient to consume trees of this size would not likely be prescribed and hand cutting and removal would be cost prohibitive. Without some means to thin these trees, fuels treatments are not expected to be fully effective in reducing potential fire severity, creating a more resilient ecological condition, or initiating the increased growth response that results from thinning forested stands. Given the current successional trajectory, continued tree mortality from insects, disease, and competition for water and nutrients would occur. The resulting accumulation of dead material would create higher fuel loads and continued susceptibility to higher intensity wildfires.

Cumulative Effects – No Action

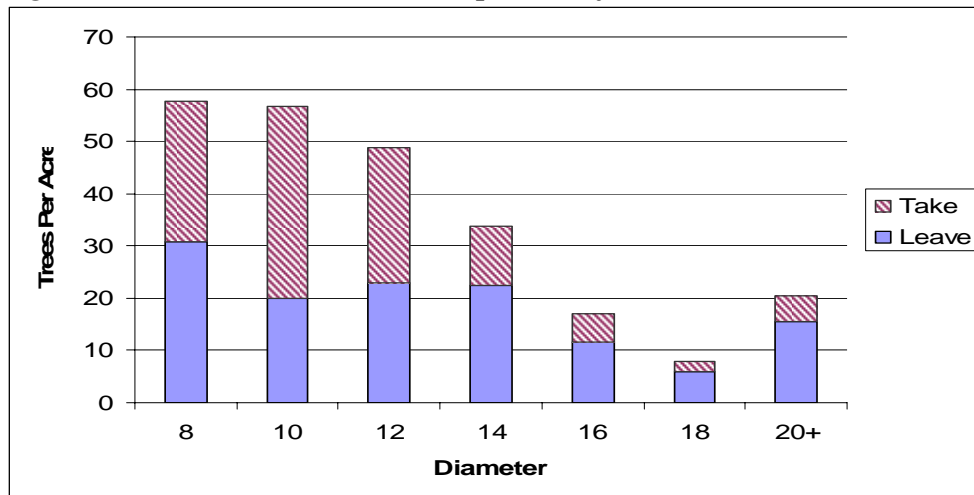
At the 5th field watershed scale, the greatest change in vegetation would likely occur on private lands. Industrial forest management objectives normally result in shorter rotations and generally a higher

percentage of early seral habitat. Oregon Forest Practices law requires prompt reforestation which results in primarily ponderosa pine plantations fully stocked within 5 years. On BLM lands, there would be relatively indiscernible vegetation changes at the watershed scale. Canopy closure from the dominant and Co-dominant trees would be retained. Snag recruitment would continue. Most of the change would occur to the vegetation and residual slash near or on the ground from the proposed slashbusted and underburning.

Proposed Action

Density Management thinning in combination with follow-up fuel reduction treatments (slash busting & light intensity underburn) as proposed, would continue to maintain connectivity and late successional habitat over time by retaining a high percentage of the healthier older/larger trees (See Figure 3). The thinning would increase resiliency of the remaining trees by reducing the competition for limited water, restore desired species composition to that describe in the RMP (page E-10), and also reduce the risk of stand replacement fire risks. Canopy closure in the more densely stocked stands would be reduced, but it is estimated that 50 percent or more of the existing canopy closure would be retained after treatment. Some larger (20+ inches DBH) trees would be harvested; however, most of the late seral structure and function would be maintained. The RMP directs that all size classes be managed. There is one standard and guide for Regeneration Harvests only that requires 16-25 large green trees per acre be retained. The silvicultural prescription directs culturing around high value, large old growth trees, particularly older pines. In many instances, these trees can be 30”- 40” in diameter. The KFRA has for a number of years thinned around these high value trees to improve vigor. In many cases, the trees marked for cutting around these large, old trees are the more shade-tolerant white fir and range in diameter from 10”-20” DBH. Therefore a diameter limit is rarely used in prescriptions.

Figure 3 – Take versus Leave Trees per Acre for the Chew Timber Sale Project Area



One approximately 40 acre Regeneration Harvest Unit would result in removal of 50-70% of the trees, primarily in a small isolated area already affected by laminated root rot (*Phellinus weirii*). It is estimated that less than 25-40 percent canopy closure would be retained within the Regeneration Harvest Unit. After harvesting, it would be reforested with more disease resistant species (incense cedar, sugar pine, and ponderosa pine). The project design feature to retain a minimum of 16 to 25 large green trees per acre in the Regeneration Harvest Unit would reduce the impact to species dependent upon late seral habitat by maintaining some connectivity, crown closure, and residual large structure.

Monitoring of Northern spotted owl density and telemetry studies in the KFRA indicate post harvested stands are continuing to be utilized by the owls. Effects from previously harvested sales on this side of the resource area have been monitored and reveal that in many post harvested stands, sufficient late seral

habitat still remains to provide connectivity habitat and sustain species dependent on these habitat components as documented in the KFRA Annual Program Summary and Monitoring Report published over the last five years (BLM, 1999-2003).

Forest health would be improved in the treated areas resulting in a decreased risk of mortality due to disease, insects, wildfire, and competition. Effects to forest vegetation from implementation of this alternative would not exceed those analyzed in the KFRA FEIS.

The follow-up proposed fuel reduction treatments are expected to reduce the Condition Class to a Level I or II. The risk of a stand replacing fire would be reduced thereby providing a greater assurance of maintaining desired habitat.

Timber harvest treatments would be designed to primarily reduce stand densities. With the exception of the one approximately 40 acre proposed regeneration harvest unit, the density management thinning proposed is designed to maintain the structural and functional late-successional characteristics. As a result, the proposed treatments are expected to have little to no reduction of late-successional habitat within the area.

Assessment of 15% Standard and Guide

The Northwest Forest Plan and the KFRA RMP state federal agencies must retain on federal lands a minimum of 15 percent of the late successional forests within a fifth field watershed (RMP page 23). Guidance from the Regional Ecosystem Office (Feb. 3, 1998) indicates that the 15 percent standard and guide applies only to commercial forest lands and at a minimum, implement the 15 percent standard and guide on the lands they manage within the watershed until further guidance is adopted. The proposed treatments will meet this criterion.

Cumulative Effects – Proposed Action

In the last decade, since the signing of the RMP in June of 1995, the KFRA has thinned, using a density management prescription, approximately 6,000 acres south of Highway 66. Approximately 4,200 acres has been in the Klamath River- John C Boyle 5th field watershed which also includes the proposed Chew Timber Sale. The general prescription has been to harvest approximately 30-35% of the basal area in the stand consisting primarily of the understory, poorer growing, suppressed, and intermediate trees with a lower percentage of co-dominant and dominant trees as Figure 3 reveals. The effects of these harvest treatments have been monitored and are documented in the Annual Program Summary and Monitoring Reports (BLM 1999-2004). In summary, the desired future conditions stated above have been met both at the project level and the landscape level. Monitoring has indicated that fire severity has been reduced on treated areas.

The effect of the Proposed Action on BLM, combined with future actions on private what would result in the following;

- No change in age or seral classification of stands on BLM lands within the watershed. Generally, the seral classification of BLM lands would remain as mid to late seral as the structural and functional composition of the stands would continue after treatment.
- As stated above, the greatest change in vegetation would likely occur on private lands with an increased percentage of early seral habitat.

Special Status Species

No Action

Vascular Plants

Since no populations of special status plant species are known to occur in the project area, no effects on these species are expected.

Nonvascular Plants

After extensive analysis conducted under the former Survey and Manage program, the FSEIS to Remove or Modify the Survey and Manage Mitigation Measures Standards and Guidelines (BLM/USFS 2004) concludes that little is known about the habitat, geographic range or population biology for nonvascular species. It is difficult to predict how these species would be affected under the No Action alternative. Although no special status nonvascular plants were found, negative survey results do not indicate that these species are not present. The one Bureau sensitive species that is documented on the Klamath Falls Resource Area (*Boletus pulcherrimus*) has only been found on the resource area in higher elevation forests. If undocumented Special Status species are present, increased tree mortality and partial fuel treatments may create additional habitat. However, increased fuel accumulation could result in wildfire intensity beyond historic levels under which these species evolved.

Proposed Action

Vascular Plants

No populations of special status plant species are documented to occur within the proposed project area. Therefore, special status plant species are not expected to be affected by timber sale or prescribed fire activities under the Proposed Action.

Nonvascular Plants

No special status nonvascular plants were found during pre-disturbance surveys. While negative survey results do not prove that species are not there, special status nonvascular plants that could be present are expected to be affected minimally or not at all from the Proposed Action. Best Management practices that protect soil and wildlife will also help in retaining microsite characteristics for most nonvascular organisms.

Cumulative Effects – Both Alternatives

Vascular Plants

At the project level, no cumulative effects to special status vascular plant species are expected from either alternative because none of these species were located within the project area. At the watershed level, the cumulative actions (thinning and prescribed fire) may indirectly have a positive affect on some species by creating habitat to which these species may be adapted.

Nonvascular Cryptogams

Neither alternative would cause cumulative effects on nonvascular cryptogams. Existing reserves, best management practices, and continued monitoring of known sites on the Klamath Falls Resource Area will help maintain the habitat for these species. A well distributed network of connected and extensive late successional forests is an important habitat component for nonvascular species (BLM/USFS 2004, Vol.1, pp141-176). The Record of Decision for the FSEIS To Remove Modify the Survey and Manage Mitigation Measures Standards and Guidelines states that the agencies special status species policies, the reserve system, and matrix standards and guidelines that provide for retention of legacy elements will still provide for diversity of plant and animal communities and conserve rare and little known species.

Noxious Weeds

No Action

Although the activities described in the proposed action would not occur, effects resulting from other proposed activities (including fuel treatments, road maintenance, etc.) would occur as described in NEPA documents pertinent to those projects. These actions would result in some ground disturbance, creating conditions that favor the invasion of noxious weeds from outside the project area and contributing to the spread of noxious weed populations already present within the project area. BMPs and PDFs similar to those described for the Proposed Action would be implemented for any BLM project and would serve to reduce the potential for these impacts. A notable exception would occur in the event of a large-scale, high intensity wildfire. Under such circumstances, there may not be time to implement certain precautions to

avoid spreading weed seeds (washing machinery before entering an area, etc.) and large areas may be stripped of vegetation creating a suitable environment for weed establishment.

Proposed Action

The use of the mechanical equipment may create the disturbed conditions under which many noxious weeds have a competitive advantage. The vehicles and machinery entering the project area to implement these treatments would increase the potential for the introduction of noxious weeds into the area from sources outside the project area. Project design features for the prevention of the introduction of noxious weed seeds and plant parts would reduce the potential for the dispersal of these species into the project area (See Appendix B.).

The potential exists to spread known populations of noxious weeds as a result of project activities. Flagging and avoidance of these populations will reduce the potential to spread these noxious weeds. Alternatively, project design features to mow noxious weed plants to the ground and wash vehicles before leaving these areas would also reduce the potential to spread noxious weeds.

Cumulative Effects – Both Alternatives

The cumulative effects of past, present and, future treatments in the watershed include disturbance of the soil and existing vegetation and increased potential for the introduction and spread of noxious weeds, whether or not the Proposed Action is implemented. The potential cumulative effect of any combination of treatments would be to increase in the number of noxious weeds species and the areas occupied by noxious weed species. However, since the KFRA has developed and implemented PDFs and BMPs for weed prevention and soil protection, these measures have been demonstrated to be effective in reducing the introduction and spread of weeds. These measures (Appendix B) will continue to be implemented; therefore, noxious weeds are not expected to increase in distribution from the implementation of planned activities. Unplanned actions (i.e., large-scale, high intensity wildfire) could increase weed distribution.

Terrestrial Wildlife Species – Affected Environment

This section focuses on those species considered special status species and potentially at risk from management activities. These will include those species listed under the Endangered Species Act (ESA - listed, proposed and candidate species) or those listed under the BLM special status species policy and considered to be Bureau Sensitive or Bureau Assessment. These species must be considered in the EA process. For a list of other species and a description of their habitat that may occur in the proposed project area, refer to the Klamath Falls Resource Area FEIS (pages 3-37 to 3-41) and the TPLA (pages 61-75).

Threatened and Endangered Species

The Bald Eagle and Northern Spotted Owl are the only two listed, proposed or candidate species under the Endangered Species Act (ESA) that may be affected by the proposed project. All other ESA species considered for this EA are not present and will not be affected by the proposed project (Refer to Table 5). These species will not be addressed further in this document.

Bald Eagles (*Haliaeetus leucocephalus*) - Federally Threatened

Two bald eagle territories (Chase Mountain and Topsy) have been documented within the proposed project area. The Chase Mountain territory has had three different nests (1983-2001) within the territory although all three nests have basically fallen apart and the trees are no longer used for nesting. Aerial surveys (helicopter and fixed-wing) were conducted in 2002, 2003 and 2005 to try and locate a nest within the Chase Mountain territory. No nests were located. A new nest was found approximately 1.3 miles away on the opposite side of the reservoir. Due to the distance from the previous nests it was labeled as a new territory although this may be the Chase Mountain pair that moved to the opposite side of the reservoir. The Topsy pair was discovered in 1998 and successfully fledged young the first three

years (1998-2001) after they were located. They have been unsuccessful nesting since but the territory is still occupied with 2 adults (Isaacs and Anthony 2004).

Northern Spotted Owl (*Strix occidentalis caurina*) - Federally Threatened

No spotted owl nests have been discovered in the proposed project area. The closest nest with a pair of owls is approximately 2.6 miles away. This pair is monitored as part of an on-going telemetry study. Year-round telemetry data has been collected on this pair since April 2002 through present. Through October 2004 only a detection of a single owl has occurred within the project area. Surveys for spotted and great gray owls were conducted in 2003 and 2004. Neither species was detected.

The project area does contain approximately 515 acres of suitable nesting, roosting and foraging (NRF) habitat and the remainder of the project is considered dispersal habitat. No Designated Critical Habitat occurs within the project.

Special Status Species (Bureau Sensitive and Bureau Assessment)

The BLM Special Status Species Policy designates special status species as Bureau Sensitive, Bureau Assessment, or Bureau Tracking. A brief description of these categories follows;

Bureau Sensitive – Generally these are species which are restricted in their range and have natural or human-caused threats to their survival.

Bureau Assessment – Species which are not presently eligible for official federal or state status but are of concern.

Bureau Tracking – This list is designed as an early warning system for species that may become threatened in the future.

It is the policy of BLM Districts to protect, manage, and conserve these species and their habitats such that any Bureau action will not contribute to the need to list any of these species. This EA will consider those Bureau Assessment and Bureau Sensitive Species that may be affected by the project. Bureau Tracking Species not considered special status species - for management purposes and will not be addressed in this EA.

Table 5 – ESA Listed, Proposed and Candidate Terrestrial Wildlife Species considered for this Analysis

Species	Scientific Name	Status	Designated Critical Habitat within project area	Species or habitat occur within the project area	May be affected by project
Canada Lynx	<i>Lynx canadensis</i>	Threatened	N/A	NO	NO
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Threatened	N/A	YES	YES
Northern Spotted Owl	<i>Strix occidentalis caurina</i>	Threatened	NO	YES	YES
Pacific Fisher	<i>Martes pennanti pacifica</i>	Candidate	N/A	NO	NO
Yellow-Billed Cuckoo	<i>Coccyzus americanus</i>	Candidate	N/A	NO	NO
Oregon Spotted Frog	<i>Rana pretiosa</i>	Candidate	N/A	NO	NO
Mardon Skipper Butterfly	<i>Polites mardon</i>	Candidate	N/A	NO	NO

Species list derived from quarterly list issued by the U.S. Fish and Wildlife Service to the Klamath Falls BLM Office (2005).

White-headed (*Picoides albolarvatus*) and Black-Backed Woodpeckers (*Picoides arcticus*) – Bureau Sensitive

The white-headed woodpecker is generally associated with ponderosa pine stands or mixed conifer stands with ponderosa pine as a dominant component. These woodpeckers forage predominately on pine seeds and insects. They have been documented on BLM lands in the vicinity of the sale area. Black-backed Woodpeckers have been found in most types of mixed conifer stands, although rare on this Resource Area and across their range. Black-backed woodpeckers forage on insects, mostly on larvae of wood-boring beetles. They are generally found at higher densities when a wildfire has occurred and burnt snags and beetles are abundant. Both species are associated with snags and need tree cavities for nesting and could be present within the project boundaries.

Northern Goshawk (*Accipiter gentilis*) - Bureau Sensitive

Northern Goshawks are widely distributed in most forest types. The Klamath Falls Resource Area has 12 documented territories, none within the project area. Surveys were conducted within the project boundaries in potential habitat in 2003. No goshawks were detected. However, two sharp-shinned hawk nests were discovered during those surveys and will be avoided. Effects on these species from the proposed project will not be assessed further.

Flammulated Owl (*Otus flammeolus*) - Bureau Sensitive

A flammulated owl was detected several times during great gray owl surveys in 2003 and 2004. No nest was found but the detections were in close proximity to each other for all detections. This species is considered rare on the Klamath Falls Resource Area with only three general locations in the RA documented but no nests are documented at this time.

Special Status Mollusks - Chase Sideband (*Monadenia chaceana*), Modoc Sideband (*Monadenia fidelis*), Crater Lake Tightcoil (*Pristiloma arcticum crateris*), Evening Field Slug (*Deroceras hesperium*) - Bureau Sensitive

Surveys for mollusks were completed in May and June 2003. Areas surveyed were those areas thought to have the highest likelihood (riparian and riparian buffer habitat) of potentially having these species. No special status mollusks were located during those surveys. Effects on these species from the proposed project will not be assessed further.

Bats - Townsend's Big-eared Bat (*Corynorhinus townsendii*), Fringed Myotis (*Myotis thysanodes*), and Pallid Bat (*Antrozous pallidus pallidus*)

All three bat species roosting habitat is typically associated with rock structures, caves, buildings and can be associated with hollow trees (Tuttle 1998). Surveys on the west-side of the resource area have documented the fringed myotis in similar habitat to that of the proposed project and there is possibility for the pallid bat and Townsend's big-eared bat to be present.

Other Species

Sharp-shinned hawks

Two active sharp-shinned hawk nests were located during goshawk surveys in preparation for this analysis. Both nest trees would be retained along with a small buffer (approximately one quarter acre) of trees around the nests to protect the structure of the immediate nest stand during any proposed activity.

Osprey

An active osprey nest is adjacent to the unit boundary in Section 1. A seasonal restriction for timber harvest and/or fuels treatment activities would be implemented within one quarter mile of an active nest from May 1st through August 1st as per the KFRA RMP. These restrictions could be waived if the territory is not occupied, nesting does not occur, the nest has failed, or the nestlings have fledged prior to the set dates.

Terrestrial Wildlife Species – Environmental Consequences

Threatened and Endangered Species

No Action

Bald Eagles

No activities associated with public lands (other than the proposed action) are known that would present any disturbances to the bald eagle during critical times of the year. There are no known risks due to human disturbance that could cause nest failure. The no action alternative would not however provide the beneficial affects of fuels reduction and stand resiliency for the long-term. The stand is currently overstocked and at risk from wildfire, disease and insect and will continue to get worse in the future. Although this may not affect the bald eagle nest stand in the short-term, the risk would continue to increase over time to the stand and bald eagle nesting habitat.

Northern Spotted Owl

There would be no immediate effects to the NRF or dispersal habitat. For NRF habitat, canopy closure would remain high in the short-term, snag density would continue to increase overtime and nesting opportunities may increase within this stand. In dispersal habitat these stands would continue to provide connectivity between those stands of suitable habitat. Owl habitat (NRF and dispersal) however would continue to be at an increasingly higher risk of stand replacing wildfire, insects and disease which in the long-term may result in the degradation or loss of owl habitat.

Proposed Action

Bald Eagle

The bald eagle is susceptible to human disturbance during critical times each year: pair bonding, courtship, reproduction, nesting and fledgling periods. Human caused disturbances associated with the proposed activities could affect reproductive success on bald eagles. However, seasonal restrictions from Jan. 1st – Aug.-15th for all activities within ¼ –mile or ½-mile line-of-sight (USDI 1986) are incorporated into the project to minimize these disturbances to bald eagles. Outside the reproductive period, bald eagles are not as strongly associated with their nesting habitat and human disturbance causes less of an effect on these adults.

Habitat modification from selective logging has been shown to be compatible with bald eagle habitat management (Arnett et al 2003). Thinning of the nest stand can promote and accelerate late successional characteristics for bald eagles, especially in overstocked stands, while still maintaining nest stand components. For the proposed project the nest trees have been identified and will be retained as well as the majority of the larger trees within the stands. Larger dead top trees, snags and any trees identified as roost or perch trees in the nest stands will also be identified and retained/protected to maintain bald eagle habitat. Monitoring has demonstrated that thinning, mechanical fuel reduction and prescribed fire projects on the Resource Area (Stukel Mountain fuels reduction, Applegate Springs prescribed fire, McFall mechanical fuels reduction) has reduced fire risk and has been compatible with maintaining bald eagle habitat. Foraging habitat does not occur within the project area and will not be affected by this project.

Northern Spotted Owl

No spotted owl nest territories or Designated Critical Habitat occur within the project boundary. Because of this, no direct effects on spotted owls from the proposed project are anticipated. The closest nest is approximately 2.6 miles away. Through the ongoing telemetry study on the closest pair, it is apparent that the proposed activity would have no direct affect on spotted owls. Only one detection of an owl occurred within the project area (winter, 2003). There is, however, approximately 515 acres of habitat within the project identified as suitable habitat under the Northwest Forest Plan (NWFP). Suitable habitat has those characteristics that could support a spotted owl and is considered to have the nesting, roosting and foraging components needed for owls. Modification (thinning) of this habitat will likely degrade the habitat in the short-term (reduce canopy closure, lower snag recruitment, reduce coarse woody debris or

CWD, and reduce understory vegetation) but should provide for some long-term benefits by promoting and accelerating larger green trees, larger snags and CWD needed for owls. Snag retention guidelines and CWD requirements for this project would minimize those short-term impacts. The remainder of the area is classified as dispersal habitat and would be maintained as dispersal habitat after the proposed treatments.

Fuels treatment (prescribed fire or mechanical reduction) immediately after the proposed thinning may further reduce components necessary for owl habitat. Stand structure (multistory stand, CWD and snags) is an important characteristic within the owl habitat to maintain nesting and foraging habitat. Removing these features of the stand structure may limit habitat suitability for owls. Project Design Features to maintain snags and CWD will minimize impacts and maintain the habitat as suitable.

Cumulative Effects – Both Alternatives

Assessing cumulative effects to wildlife is difficult due to the scale, range of the species, distribution, life history and habitat. For this assessment the extent of the analysis considered will vary by species but primarily be focused on the extent of the Klamath Falls Resource Area boundaries, including private lands and that portion of the species range that falls within those boundaries.

Bald Eagles

The bald eagle continues to recover throughout its range including the Klamath Basin. In 1995, the RA had eight occupied nest territories documented (Isaacs, Anthony 2004). In 2004, the number of occupied territories had increased to 20 documented on the resource area. The KFRA resides within Recovery Zone 22 under the Pacific States Bald Eagle Recovery Plan. When the Recovery Plan was published there were 77 occupied nest territories in Zone 22 (USDI 1986). The recovery goal was 108 territories; there are currently 128 occupied territories in zone 22 (Isaacs and Anthony 2004). It is felt that Zone 22 has met its recovery goals for occupied nesting territories. Vegetation treatments (with or without the proposed action) may have some short-term negative effects (primarily disturbance) on bald eagles, but will be beneficial overall to bald eagles and their habitat. This project will continue to maintain and improve nesting habitat for the two territories within the sale area. Other planned projects on public lands are designed to maintain or enhance bald eagle habitat. Seasonal restrictions are used to minimize disturbances to bald eagles during the critical periods of the year when they are most susceptible to disturbances.

Northern Spotted Owl

To address cumulative effects on spotted owls and spotted owl habitat the most efficient way is to look at habitat within the KFRA and the effects on spotted owl habitat over time. Since there are no direct effects anticipated on spotted owls (no nest territories in the project area), the suitable habitat within the project is the main issue. In 1994, when the NWFP was implemented the KFRA had an estimated 21,600 acres of suitable habitat. In 2005, there are approximately 16,900 acres of suitable habitat still remaining. The reduction in habitat is primarily from timber harvest. Ingrowth of suitable habitat has not been assessed for consultation purposes at this time.

The proposed sale has approximately 515 acres of spotted owl suitable habitat that will remain suitable habitat after the proposed project. The habitat may be degraded in the short-term but in the long-term it should benefit from the thinning and fuels reduction. Habitat that is currently classified as dispersal habitat will remain dispersal habitat and provide connectivity to owls moving within the resource area. The additional fuels reduction work within spotted owl habitat in the proposed project will not detrimentally affect spotted owl habitat and in the long-term will provide more fire resilient habitat.

The principal change in habitat for owls in the resource area has occurred on private lands. The majority of the private lands within the west-side of the KFRA boundaries have been harvested, considered early seral habitat and would not be considered suitable nesting habitat or often even dispersal habitat. The

overall affect of this type of harvest practice on spotted owls within the resource area is unknown at this time.

Special Status Species

No Action

The status quo will maintain current habitat in the short-term for the woodpeckers, bats and flammulated owls by continuing to provide snags and green trees. This management will continue to provide habitat but will lack the benefit of thinning to promote larger trees. Also there will continue to be a risk of habitat loss from wildfire and insect outbreak. Wildfire would be detrimental to all the special status species assessed in this document other than the black-backed woodpecker. The black-backed woodpecker is often associated with snags created from wildfires and the insects that are generated from this type of disturbance. Insect outbreaks are beneficial to both of the woodpecker species.

Proposed Action

White-headed and Black-Backed Woodpeckers

The two special status woodpeckers that may occur within the project area are associated with ponderosa pine and mixed conifer stands. The proposed treatment will remove some trees that add to the suitable habitat for these species, primarily dead-top trees. However, snag retention guidelines that are based upon the NWFP Standards and Guidelines will maintain foraging and nesting habitat for both of these species. Green tree retention will also provide foraging for both species. No snags are planned to be cut unless required by OSHA. This would protect and maintain snag habitat that is currently available. Thinning will continue to promote larger trees in the stand which will also benefit both woodpeckers. Both use larger (>16") snags, dead-top and heart rot live trees for their nesting structure.

Flammulated Owl

The area where the detection of the flammulated owl has occurred on several occasions is an area planned for density management. The flammulated owl is associated with pine dominated, open mixed conifer stands. There would likely be some short-term disturbance from the proposed action and some potential nesting structure may be removed. The proposed action would have some long-term benefit to flammulated owl habitat by providing more openings and providing more foraging opportunities (forages primarily on moths) while still maintaining nesting structure. The owl is a cavity nester and the snag retention guidelines will assure that snags are maintained to provide for nesting habitat. Surveys for this nest site will continue this year (2005) to try and determine a nest tree.

Townsend's Big-eared Bat, Fringed Myotis, and Pallid Bat

These species may occur in the project area although they are generally associated with caves, mines or rock crevices. They are sometimes found using cavities in snags as roost. Although some cavity roost areas may be lost, the snag retention guideline will maintain sufficient snags to provide for roosting structure. There would likely be some short-term disturbance to these species within the project but this would end at the completion of project activities.

Cumulative Effects – Both Alternatives

It is the policy of the BLM to protect, manage, and conserve special status species and their habitats such that any Bureau action will not contribute to the need to list any of these species. For special status species such as woodpeckers, owls, and bats the primary habitat components needed are large snags, large green trees and CWD. The standards and guidelines in the NWFP, additional guidelines in the KFRA RMP, and the project design provide for these habitat components to ensure that these actions do not further the need to list these species. The cumulative effects for this project and others on both public and private lands within the KFRA would not adversely affect the populations of special status species on public lands on the resource area and will not contribute to the need to list these species. Project design features, BMPs and Standards and Guidelines ensure that habitat components necessary for these species are maintained during implementation of projects.

Soils - Affected Environment

The main soil type is the Woodcock-Pokegama complex. Soils within the project area are rated as having low to moderate surface erosion and compaction susceptibility. The analysis area contains slopes ranging from 0 to 70 percent with most of the area between 12 to 35 percent. Approximately six percent of the area is steep with slopes ranging from 35 to 55 percent. (Refer to Table 6 below.) Most of the ground in excess of 35 percent slope is not included in the proposed timber sale, but would be included in fuel reduction treatments. Past soil disturbance has occurred in the project area as evidenced by old landings and skid trails. Many of the older skid trails are presently covered with brush and trees indicating amelioration of past soil disturbance. Winter snow depths in the analysis area range from 2 to 8 feet, so snow logging is a feasible option. Additional discussion of soil issues and concerns for the affected environment are addressed in the KFRA RMP and the Topsy Landscape Analysis Area.

Table 6 – Soil Types, Slopes, and Acres for BLM and Private Land within the Analysis Area

Acres	Soil Type	Percent Slope
35.0	Bly-Royst Complex	1 to 12
62.5	Greystoke Stony Loam, South Slopes	35 to 55
188.3	Greystoke-Pinehurst Complex, North Slopes	12 to 35
78.4	Pinehurst-Greystoke Complex	1 to 12
131.6	Pokegema-Woodcock Complex	1 to 12
2.6	Skookum-Rock Outcrop-Rubble Land Complex	35 to 70
9.7	Woodcock Stony Loam, South Slopes	35 to 55
676.0	Woodcock-Pokegema Complex, North Slopes	12 to 35

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Official Soil Series Descriptions available: URL: "<http://soils.usda.gov/technical/classification/osd/index.html>" [Accessed 2/10/04]

Soils - Environmental Consequences

No Action

Soil disturbing treatments, such as slashbusting, implemented under the No Action alternative would include those described in other NEPA documents (Table 3). Soil amelioration of previous soil disturbances would continue to occur on old skid trails and landings in the project area. The No Action alternative could result in leaving these stands in a higher vulnerability to stand replacing wildfires. The subsequent soil effects from a stand replacing wildfire could result in a greater potential for surface erosion.

Proposed Action

Implementing the Proposed Action will result in some detrimental soil effects, primarily soil compaction and displacement, from the ground based operations. Based upon past monitoring for soils impacts, these effects would occur primarily on the landings and the main skid trails into the landings. Detrimental soil effects can include soil displacement, creation of adverse cover conditions, and detrimental soil compaction (defined as 15% increase in soil bulk density). These effects were analyzed for in the FEIS (pages 4-11 to 4-18).

Most harvesting operations on the resource area are done using mechanized ground based equipment, in particular when harvesting small diameter trees (<20"DBH). This involves grapple skidders and a mechanical harvester that has a sawhead at the end of a 20 foot hydraulic arm. The use of a mechanical harvester normally results in a greater area of ground disturbance since it is not confined to skid roads. The mechanical harvester generally leaves the skid trails to cut and bunch trees designated for cutting. The mechanical harvester has a 20 foot radial arm and is able reach into stands and extracts trees without having to drive up to every tree. Since use of a mechanical harvester is becoming the industry standard and is the most economical choice for small diameter density-management thinning of forest stands, the

resource area is continuing to implement monitoring in representative ground disturbing projects to evaluate soil health and determine the areal extent of soil disturbance and changes in soil structure (compaction) as it relates to plant growth.

Mitigation

The Klamath Falls RMP Best Management Practices are designed to limit detrimental soil disturbance to less than 20% of the total acreage within an activity area (Page D-11 of the RMP). To minimize soil disturbance, common BMPs and PDFs required are:

- Cable logging will be used on the steeper slopes to reduce soil disturbance.
- Use of existing designated skid trails, marked in advance for logging operators to confine soil disturbance.
- Seasonal restrictions to limit logging operations to the dry season to prevent compaction, puddling, and erosion.
- When reasonably feasible, require operations when snow depths exceed twenty (20) inches in depth.
- Slash that is left on the project area from manual treatments will serve to reduce surface soil erosion and sedimentation

Should conditions suitable for logging over frozen ground or snow occur (the snow pack persists and the area remains accessible), soil disturbance in treatment areas would be further minimized. Two timber sales have been completed on the KFRA, Clover Hookup (2002) & Saddled Again (2004/2005), where the sale was logged over 20 inches of snow. Implementation monitoring observations indicated almost no disturbance to the surface organic layer.

If implementation monitoring shows detrimental soil effects in excess of 20 percent of the total acreage within an activity area, the BMP guidelines (KFRA RMP, page D11) state that impacts will be mitigated with treatments such as ripping, backblading, or seeding.

Cumulative Effects – Both Alternatives

The monitoring information, collected to date, regarding the effectiveness of BMPs on minimizing soil compaction and disturbance (BLM 1999-2004) indicates that cumulative effects to soil resources would not exceed the RMP standards for detrimental soil conditions (ROD, page D-11). Treatments would continue to be implemented during the summer months (June-October) when soils are least susceptible to compaction. Snow logging will be used when possible. Logging on snow or frozen ground has been shown to reduce compaction to soils (Smith and Wass 1976, Mecleod 1998, Krzic 2004). Ongoing monitoring to measure soil compaction and recovery will assure that effects on soils are within the RMP standards and are mitigated by appropriate measures when needed. The proposed action would result in a reduced vulnerability to stand replacing wildfires, but an increased potential of soil compaction and potential runoff from the proposed skid trails.

Roads - Affected Environment

Current road densities on BLM land in the project area are approximately 6.4 miles of road per square mile due to the small design of this sale area and the associated terrain (Table 7). The average road density within the Topsy/Pokegama Landscape Analysis area is 3.9 miles per square mile (BLM 1996). The RMP objective is to reduce road density to 1.5 miles per square mile. All roads within the proposed treatment area in sections 11, 12, and 14 are located in the Pokegama road closure and are seasonally closed from November 20th to March 30th. This road closure is a cooperative agreement (February 1991) among BLM, Pacific Power and Light (PP&L), Timberland Resource Services, and Oregon Department of Fish and Wildlife. This agreement, which encompasses all ownerships in the closure area, remains in effect. Objectives of the Pokegama road closure are to reduce road damage and soil erosion and to protect

wildlife habitat during critical periods. Roads within sections 1, 3, and 5 are not within any formal road closure area but access is limited during the winter months due to snow depths.

Table 7 - Road Density in Chew Timber Sale Project Area (BLM ownership)

	Drainage Density (miles of stream per square mile)	Road Density (miles of road per square mile)	Number of Stream Crossings (per mile of road)	Miles of Road within 100 feet of streams
Chew Contract Area	2.7	6.4	1.5	8.8

Roads - Environmental Consequences

No Action

Road maintenance would continue periodically. This would involve grading and spot rocking depending upon annual road maintenance needs and funding. The Pokegama seasonal road closure would remain in effect. The blocking of two miles of spur roads as described in the Proposed Action would not occur, resulting in more open road during permitted use periods (i.e. April 1 – November 19th). There would be no improvement of existing road surfaces or drainage features and no change to current potential for input of sediment into streams.

Proposed Action

There will be no net change in permanent road densities. No new road construction is proposed. The Pokegama seasonal road closure will remain in effect. There will, however, be additional proposed year round rock blockages of two miles of spur roads with a subsequent decrease in the amount of open roads during the period when the seasonal closure is not in effect. This will help to meet RMP objectives to decrease road density. Improvements in road drainage facilities and the additional 1.5 miles of surfacing would provide a benefit to water resources by reducing potential inputs of sediments from roads into streams. Surfaced roads generally produce less sediment erosion than unsurfaced, dirt roads. Effects from the proposed action in regards to roads would not exceed those addressed in the RMP/FEIS.

Cumulative Effects – Both Alternatives

The KFRA continues to strive to reduce open road density and environmental effects associated with roads during implementation of projects proposed in the foreseeable future. A combination of BLM and private checkerboard ownership and subsequent access agreements with adjacent landowners reduces BLM’s flexibility in managing road densities. At the landscape level, the Proposed Action would provide an incremental improvement over the status quo. Over time, the expected cumulative effect of incremental improvements from each project is to reduce road density in the watershed. At the project area level, year round closure of two miles of road affects over 20 percent of the existing roads.

Hydrology - Affected Environment

The Chew Timber Sale analysis area is located in the Klamath River-John C. Boyle Reservoir 5th Field Watershed in the Upper Klamath River Sub-basin. There are approximately 7.9 total miles of stream in the analysis area, 3.1 miles of intermittent streams and 4.8 miles of ephemeral streams (See Map 2 in Appendix C). There are no perennial streams in the proposed project area. Riparian reserves would be established along intermittent streams following RMP guidelines (Appendix B).

Most of the vegetation beside intermittent and ephemeral streams is similar to the adjacent upland forest types. Riparian reserves are comprised of sparse to no riparian vegetation and overstocked stands. Past fire exclusion and harvesting practices have created these overstocked conditions. In their present state, riparian reserves are as vulnerable to stand replacement wildfires and insects as the adjacent upland matrix lands.

Hydrology - Environmental Consequences

No Action

Although this alternative would result in no immediate timber harvesting, a combination of fuel treatments and road maintenance activities would likely occur in the project area within the next five years. There would be no soil disturbance from ground-based logging equipment, but soil compaction and erosion could be expected from slashbusting and prescribed burning. Vegetation that has become established on some existing roads and skid trails would not be disturbed by mechanized equipment and would continue to contribute to the capture and infiltration of water. Routine road maintenance (grading and spot rocking) would occur periodically and be designed to minimize effects on sediment inputs into stream channels. Resurfacing or installation of drainage features described in the Proposed Action would not occur and current potential for input of sediment into streams would not be addressed.

The composition and character of forest stands adjacent to streams would not be altered. The risk of catastrophic wildfire would not be effectively reduced in overstocked stands, which could result in extensive mortality within riparian reserves. This could reduce the future supply of LWD and would reduce stream shade. A catastrophic fire event would trigger erosion and increase sediment inputs to stream channels.

Proposed Action

Potential effects on water resources resulting from proposed management activities would include compaction and erosion from ground-based logging equipment. Soil compaction can reduce water storage and capacity, decrease infiltration, and increase overland flow. Soil compaction and displacement can cause erosion and increase sediment inputs to stream channels. Areas especially susceptible to erosion are sites where slopes are 30% or greater. (Approximately six percent of the area is steep with slopes ranging from 35 to 55 percent.) By excluding most of the project area that is in excess of 35 percent slope from the proposed timber sale and following BMPs and PDFs (Appendix B), negative effects from compaction and erosion are expected to be minimal.

Treatments in riparian reserves would have short-term adverse effects on existing vegetation in these areas. Existing vegetation aids in capture and infiltration of water which affects the release of this water in stream channels. Thinning and fuels reduction treatments in riparian reserves could have a beneficial effect on the amount, rate, timing, and duration of surface flow in the streams channels. Since the vegetation and soil conditions affect these attributes of water flow, treating riparian reserves would create more stable stand conditions, including improving resiliency of remaining trees. This would result in flows more similar to reference conditions. Treating overstocked stands could allow more water to flow down intermittent stream channels since there would be less transpiration from trees in the stand. By thinning the overstocked riparian reserves, site productivity could improve as more water is captured, stored, and released down stream channels and drainages. Adherence to BMPs and PDFs would minimize adverse effects of harvest activities on the riparian resources.

Use of existing roads and skid trails within the riparian reserves could remove most vegetation established on these routes since their last use. Vegetation would be affected by machinery passing over the routes, and surrounding vegetation could be affected by soil displacement from the roads and trails. This could cause a reduced amount of water capture and infiltration in the short-term. Adverse effects from loss of vegetation are likely to occur until the disturbed sites are re-vegetated. Applying PDFs, such as reseeded of roads and trails after project completion, would minimize adverse effects on the vegetation on the routes and to the immediate surrounding vegetation. The long-term positive effects on the vegetation community from overstory thinning and reduction of fuel loads would outweigh these short-term negative effects.

No new roads would be constructed in the analysis area, however many existing roads are near streams. Forty-six percent of the existing roads are within 100 feet of an intermittent or ephemeral stream and

there are approximately 1.5 road crossings per mile of road (Table 7 and Map 2 in Appendix C). One road within the analysis area crosses an ephemeral stream and does not have an improved stream crossing (Map 2 in Appendix C). Some sediment could enter streams as a result of soil disturbance on roads that cross or are near streams and riparian reserves. Sediment could also enter streams from road maintenance and renovation activities, and from hauling activities adjacent to streams. Sediment entering the streams could have a negative effect on water quality, but following BMPs and PDFs would minimize sediment inputs, thus reducing probability of adverse effects.

Road improvements, renovations, and blocks could result in beneficial effects on water quality in stream channels. These road treatments would aid in reducing sediment inputs from roads into stream channels by improving water drainage off roads and eliminating traffic. In addition, since the Pokegama Road Closure will continue to be implemented (See “Roads” section) and no new proposed road construction will occur in the analysis area, there would be low potential to adversely affect groundwater recharge and aquifer function due to additional roads.

Based on the above analysis and review of the proposed action, proposed activities are consistent with the objectives for riparian reserves and the Aquatic Conservation Strategy (ACS) in the KFRA RMP and would not prevent or retard attainment of any of the ACS objectives (RMP, pages 7-8).

Cumulative Effects

The analysis area considers the entire Klamath River-John C. Boyle Reservoir 5th Field Watershed (Map 1 in Appendix C). The proposed project treatment areas comprise approximately 2% of the 5th field watershed. Cumulative effects from the Proposed Action are expected to be minimal at the watershed scale because the analysis area comprises a very small percentage of the watershed. Although the Klamath River is included in the watershed, the treatments proposed would not produce effects that would affect this system.

Timber management in the last decade on BLM land has included approximately 4,200 acres of thinning in the watershed. Stands throughout the Matrix allocation are expected to be selectively harvested approximately every 20-30 years, according to Klamath Falls Resource Area plans. Current timber management on the surrounding private land is more intensive and occurs on a larger scale. This management regime is expected to continue in the future. The treatments proposed under the Proposed Action would aid in reducing the likelihood of a future catastrophic fire event at the watershed scale in the long term. These management actions would be part of establishing a more stable and resilient ecological condition in the watershed.

Since no new roads are proposed, there would be no incremental increase in negative cumulative effects from the current road network in the analysis area. There would be positive effects, however, from the road improvements, renovations, and blocks. Measurable cumulative effects from the Proposed Action are not expected at the watershed scale. The analysis area consists of such a small proportion of the watershed, and the timber management on BLM lands in the analysis area is minimal when combined with timber management on surrounding private lands. At the watershed scale, management on BLM and private lands would aid in reducing stand replacement fire events and improving ecological conditions.

Aquatic Wildlife Species – Affected Environment

Fish are not known to occupy intermittent streams within the project area due to the lack of continuous connectivity and low relative water quantity that limits the ability of these streams to provide habitat for a diverse fish assemblage. Amphibian species known to occur are those generally associated with intermittent and ephemeral water sources. These include Pacific chorus frog, the long-toed salamander, and the Western toad. Riparian-dependent vertebrates in the area include the Klamath garter snake, common garter snake, mountain kingsnake, and Western Pond Turtle. The Klamath River is considered

outside the area of effect for this proposal, so fish and other aquatic species that occur in the Klamath River are not considered in this analysis.

Aquatic Wildlife Species – Environmental Consequences

No Action

Limited ground disturbance and changes to vegetation resulting from fuel treatments and routine road maintenance would have minimal effect on aquatic species and habitats. Riparian reserves would remain at risk for stand replacing wildfire and the resulting negative effects on aquatic species from erosion, higher than normal nutrient concentration, and sedimentation.

Proposed Action

Aquatic species and habitats in the timber sale planning area could be affected to the extent that hydrologic regimes of tributary streams are altered by ground disturbance and road use (see Hydrology section). If ground disturbances (compaction, vegetation removal, loss of duff/organic layer, and increased road use) act in combination to increase the magnitude of peak runoff events, negative effects on aquatic species from erosion, higher than normal nutrient concentration, and sedimentation are to be expected. Aquatic species known to occur in the area are generally tolerant of intermittent and ephemeral water supplies, high water temperatures, and high sediment/nutrient supplies (BLM 1996). Implementing the project design features in Appendix B is expected to mitigate effects on aquatic species to levels analyzed in the RMP and FEIS.

Cumulative Effects

Due to the limited aquatic habitat and lack of continuous connectivity in the project area, cumulative effects from either alternative would not be measurable at the project or watershed scale.

Grazing Management - Affected Environment

Livestock

Two active BLM cattle grazing allotments lie partially within the analysis area. These are listed below, along with the maximum number of livestock grazed via the BLM leases and season of use:

- Edge Creek Allotment (#0102 - North Pasture) – 50 cattle from 5/1 to 9/15
- Chase Mountain Allotment (#0101) – In non-use since 1993.

In 1993, Weyerhaeuser (now U.S. Timberlands/Inland Fiber, LLC) cancelled their grazing leases in the analysis area. Their stated reason for the cancellations was to protect riparian and wetland areas on their lands. This cancellation caused the full revoking of both BLM grazing leases area since these grazing leases were linked to the Weyerhaeuser lands as recognized base property. The Chase Mountain allotment continues to be in non-use; the Edge Creek allotment was again leased for grazing beginning in 2001, which continues today.

For a complete description of the grazing allotments, including historic and current use levels, allotment boundaries, and current range conditions, reference the TPLA (pages 135-154). Additional information is in the Klamath Falls Resource Area FEIS, RMP/ROD, and Rangeland Program Summary. Both allotments also had *Rangeland Health Standards Assessments* (RHSA) prepared and finalized for them in 2000-2001. Both RHSAs determined that the current (or lease defined) grazing management to be appropriate for the meeting of all 5 Standards for Rangeland Health, but did find other land management activities to be contributing to non-attainment. The primary non-attainment factors were past timber harvest activities and declining forest health.

Wild Horses

The Pokegama wild horse Herd Management Area (HMA) lies partially within the western portion of the analysis area to the west and north of the Klamath River Canyon (Edge Creek allotment). According to the TPLA, the number of wild horses in 1995 (estimated at 50-75) was causing periodic over-utilization of several localized riparian/meadows. The TPLA recommended an Appropriate Management Level (AML) of 30-50, which was an affirmation of the level proposed in the RMP/EIS. This number was determined to be a level that would meet the Wild Horse Act (1971) objective of maintaining or achieving a "thriving natural ecological balance between the wild horse population, wildlife, livestock, and the vegetation, and to protect the range from deterioration associated with overpopulation." The AML was also affirmed in EA #OR-010-95-10 - a district wide wild horse capture EA and in the recently (2002) revised Pokegama Herd Management Area Plan (HMAP).

In 1996, 20 head were trapped and removed from the herd area and again in 2000, 18 head were removed. Recent (2003-2004) horse census counts indicate a current herd size of 25-35 head, which is well within the AML and not causing any known resource problems.

For additional detail about the Pokegama HMA, reference the TPLA (pages 155-168), the Klamath Falls Resource Area RMP/ROD and FEIS, and the 2002 revised HMAP.

Grazing Management - Environmental Consequences

Livestock and Wild Horses

No Action and Proposed Action

In general, neither alternative would have any measurable effects on cattle grazing or the wild horse herd. There would no effects from either alternative to the grazing in the Chase Mountain allotment since no grazing is occurring and none is planned in the foreseeable future. Forage abundance and availability aren't currently known to be a concern in the area for any animals (there are no wild horses in the Chase Mountain allotment).

In the area with active livestock grazing (Edge Creek allotment) the effect of the Proposed Action would be minimal - though in concept positive - since the opening up of the forest canopy allows for an increased abundance of the herbaceous plants favored by grazing animals including cattle, horses, and elk. However, forage isn't currently known to be a limited factor in this allotment for any of these animals. Alternative 2 would conceptually be a neutral effect since herbaceous forage levels would not change one way or the other.

The activities necessary to implement the Proposed Action may disturb the wild horse herd in the Edge Creek allotment, temporarily displacing them to less preferred areas. However, the extensive harvest activities on the highly intermingled private lands in recent years have apparently not been a problem, and the area available for the horse herd is very large in comparison to the actual number of horses. Thus, no effect is envisioned. There would no effects on the herd – positive or negative - with the No Action alternative except that there would be less potential for harassment of the animals.

Cumulative Effects

Seven different grazing allotments are affected by management actions in and adjacent to the analysis area. Cumulative effects in the short term (less than 2 years), include a slight decrease in available forage for livestock and wild horses. The long-term cumulative effects of vegetation treatments will be to improve ecological condition and provide an increase in palatable herbaceous plant species, especially in areas with little understory now.

Cultural Resources - Affected Environment

Native American use of the area spans many millennia. The area is within a larger territory ceded to the United States in 1864 by The Klamath Tribes. Along with the Klamath and Modoc, Shasta and Takelma peoples likely utilized this area as well. The Klamath River Canyon, although not considered within the analysis area, bisects the Chew Timber Sale area. The Klamath River Canyon is extremely rich in archaeological and historical resources and presumably served as one corridor for entry into the analysis area by both prehistoric and historic inhabitants. To date, archaeological and ethnographic research has demonstrated a significant and apparently year-round use of the Klamath River Canyon by prehistoric groups. Upland use, which corresponds more closely with the Chew Timber Sale area of analysis, was apparently only associated with seasonal rounds conducted for subsistence needs.

Historically (post-1846), after the establishment of the Applegate Trail, the project area was used primarily for logging and ranching. Logging began in the 1860s with a few small enterprising sawmills. The industry boomed in the early twentieth century both in and around the project area after the introduction of railroads. Weyerhaeuser arrived in 1923 and began constructing logging roads. Early historic towns and mills in the region include Snow, Pokegama, and Dixie. This region was also crossed by numerous early and important travel routes including the Applegate Trail, Southern Oregon Wagon Road, Topsy Road, and Ward Road. Today logging and ranching continue to be significant in the area.

Additional information about cultural resources in the analysis area may be found in various overviews of the history and prehistory of the region (Beckham 2005, Follansbee and Pollack 1978, Mack 1991, and Spier 1930).

Cultural Resources - Environmental Consequences

No Action

Under the no action alternative, the three known archaeological sites in the proposed treatment area would continue to be protected from ground disturbing activities. Fuels treatments proposed in the future would be reviewed for cultural resources on a case by case basis and adverse effects will be avoided.

Proposed Action

All proposed treatment areas have been surveyed for cultural resources using BLM Class III survey methods. Three archaeological sites are known within areas proposed for treatment. Site forms for these sites have been forwarded to the Oregon State Historic Preservation Office (SHPO). Each of the three sites will be avoided by creating a buffered area encompassing the identified resource, and the stands will not be treated within the buffer. Thus, no adverse effects to cultural resources are anticipated as a result of this alternative.

Cumulative Effects

Under all action alternatives, the potential to encounter, or disturb, subsurface archaeological deposits appears limited based on regional survey results and the nature of disturbances anticipated. Protection measures (flagging and avoidance, buffers, and boundary adjustments) implemented for past actions have been effective in preventing effects on cultural resources and will continue to be used to avoid effects for current and future activities.

Recreation Resources - Affected Environment

The analysis area provides opportunities for dispersed recreation such as hunting, fishing, off-highway vehicle driving, camping, sightseeing, mountain biking. Recreation facilities with some level of development include Topsy campground and a network of forest roads. Topsy campground is a 15 unit campground located on J.C. Boyle reservoir. Forest roads in section 1 provide access off of Highway 66 to the upper Klamath Wild and Scenic River and other BLM recreation facilities.

The analysis area currently receives light dispersed recreation use most times of the year. No new recreation facilities are proposed within the analysis area. A portion of a proposed OHV trail traverses section 5 within the planning area.

For additional information about recreation resources in the analysis area, reference the Topsy/Pokegama Landscape analysis, pages 173 through 179. For general information about recreation in the area, refer to the Klamath Falls RMP/ROD pages 47-53, and RMP maps 2-8 and 2-10.

Recreation Resources - Environmental Consequences

No Action

Opportunities to pursue recreation resources are expected to continue unchanged under this alternative.

Proposed Action

Only temporary, minor disruption to recreational users would occur during treatment activities. Short-term disturbances to recreationists from truck traffic, equipment noise, dust and smoke associated with treatment activities would be expected. A positive recreation benefit of treatment activities could occur through the increased availability of firewood and enhanced mushroom gathering opportunities.

The impacts associated with the proposed selective harvest or thinning, riparian treatments and fuel reduction as described in the Proposed Action would not approach or exceed those described in the Klamath Falls Resource Area Final RMP (pages 4-104-108). Closing short spur roads would have minimal effect on recreationists; some positive and some negative depending on the nature of the activities they participate in.

See Appendix B for suggested Project Design Features and Mitigation related to recreation resources.

Cumulative Effects – Both Alternatives

Cumulative effects from either alternative are expected to be negligible, except in the event of a large scale wildfire.

Visual Resources - Affected Environment

The BLM has a basic stewardship responsibility to identify and protect scenic 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.

BLM lands within the analysis area contain a variety of landforms and scenic/aesthetic qualities.

The analysis area contains lands that are managed under the following BLM Visual Resources Management (VRM) Classes:

VRM Class II: BLM lands within the viewshed of the upper Klamath River. VRM Class II management objectives are for low levels of change to the characteristic landscape. Management activities may be seen but should not attract attention. Within the analysis area, section 12 and 14 and the southern portion of section 11 are within the VRM class II area.

The rest of the analysis area is comprised of VRM Class III lands. Management objectives for VRM Class III are to manage for moderate levels of change to the characteristic landscape. Management activities may attract attention but should not dominate the view of the casual observer.

For additional information about scenic resources in the analysis area, refer to the Klamath Falls RMP/ROD pages 43-44, and RMP maps 2-5.

Visual Resources - Environmental Consequences

No Action

Current scenery will remain unchanged except for gradual changes as the stands age and additional trees die from insects and disease. No short term effects on visual resources would be expected, however there is a greater likelihood of widespread insect mortality and catastrophic fire, which would greatly affect long term scenic resources.

Proposed Action

Proposed treatment activities would have minimal negative effects on visual resources. Maintaining an uneven-aged, multi-strata stand structure and reducing competition and stress to reserve trees, will reduce the to impact visual resources.

Long-term management of visual resources within the analysis area will likely be positively affected by proposed treatments, riparian area thinning, and follow-up prescribed fire activities. These treatments will greatly reduce the opportunity for catastrophic wildfire and increased insect mortality due to drought within the treated areas.

Some additional project design features (Appendix B) have been proposed to reduce the visual effect of harvesting along major roads, within VRM class II areas and within 1/4 mile rural housing. The proposed regeneration harvest is not in the VRM class II area, or near major roads.

Cumulative Effects – Both Alternatives

Cumulative effects from either alternative are expected to be negligible, except in the event of a large scale wildfire.

Socioeconomics – Affected Environment

The proposed action lies within an area that is used by a variety of the public for recreation, hunting, fishing, mushroom gathering, as well as other uses. The project area has provided a sustained supply of timber for processing in the surrounding communities including; Klamath Falls, Yreka, and Medford. Some timber has gone as far as Redding or Glide for processing. For every million board feet of timber harvested and processed in Oregon, approximately 10 jobs are generated, 8 in the lumber and plywood industry and 2 in the logging industry (Charnley, S., ed. – In press].

In addition to the timber value, the Klamath County Economic Development Association (KCEDA) has recently completed a biomass study to determine the feasibility of constructing a small sawlog mill and wood residue biomass plant in Klamath County (Continental Resource Solutions, Inc. 2004). The objectives would be to increase the utilization of smaller diameter material and logging residue typically burned in the forest. Additional benefits as indicated in the study would be employment opportunities within the county associated with biomass utilization as well as hazardous fuel reduction on thousands of acres of forest land. The proposed project will make available for utilization biomass material that typically is not processed for lumber or veneer. This could result in additional employment.

Socioeconomics – Environmental Consequences

No Action

The No Action alternative would affect local businesses primarily dependent upon forest products. Based upon the assumption above that for every 1 million feet of timber harvested, 10 jobs are generated, approximately 30 jobs either locally or within the community that processes the timber could be impacted. The No Action alternative should not result in any detectable socioeconomic change in regards to recreational uses. Hunting, fishing, and other recreational uses are expected to continue at the present level regardless of the No Action or Proposed Action.

Proposed Action

The proposed action would remove approximately 3 million board feet of timber (3MMBF) and result in approximately 30 related jobs. The local area processes a considerable amount of timber and the proposed action is only a small percentage what is processed annually. The RMP states that the annual sale quantity for the Klamath Falls Resource Area from Matrix lands is approximately six million board feet (6MMBF). Processing facilities are dependent upon a stable, sustainable, and reliable supply of timber. Continual litigation of timber sales on federal lands has decreased the stability of a sustainable supply. The cumulative effects of this instability are closures of processing facilities and the corresponding loss of jobs. Although private timberlands supply much of the present demand for timber, some of the present forest industrial infrastructure is dependent upon a sustainable supply of timber from federal lands. Timber Harvest from public lands in Klamath County has dropped from 312,149 MBF (67.6% of the total) in 1986 to 37,745 MBF (18.2% of the total) in 2002 (Continental Resource Solutions, Inc. 2004).

The Oregon and California Railroad and Coos Bay Wagon Road Grant Lands Act (O&C Act) (43 U.S.C. § 1181a, et seq.) provides the legal authority for the management of O&C lands by the Secretary of the Interior. The O&C Act requires that the O&C lands be managed “...*for permanent forest production, and the timber thereon shall be sold, cut, and removed in conformity with the principal of sustained yield for the purposed of providing a permanent source of timber supply, protecting watersheds, regulating stream flow, and contributing to the economic stability of local communities and industries, providing recreational facilities...*” The proposed action helps meet the objectives of the act by providing for needs identified above.

CHAPTER 4 – CONSULTATION

Endangered Species Act Consultation

Section 07 consultation with the FWS was completed for the proposed thinning and regeneration harvest. A determination of “May Affect, Not Likely to Adversely Affect” was made by the BLM for the bald eagle and northern spotted owl. A “No Effect” determination was made for all other listed species. The service concurred with this determination (concurrence letter 2004; 1-10-04-140). Consultation on the fuels reduction program was completed at an earlier date for prescribed fire and mechanical fuels reduction. A determination of ‘May Affect, Not likely to Adversely Affect” the bald eagle and n. spotted owl was made by the BLM. The Service concurred with this determination (concurrence letter 2002; 1-10-02-I-098).

CHAPTER 5 – LIST OF PREPARERS

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Appendix B – Summary of Best Management Practices and Project Design Features

Appendix D of the RMP (pages D1-D46) describes the Best Management Practices (BMP) that are “designed to achieve the objectives of maintaining or improving water quality and soil productivity and the protection of riparian-wetland areas”. Best management practices are defined as methods, measures, or practices selected on the basis of site-specific conditions to ensure that water quality will be maintained at its highest practicable level (D-1, Appendix D, RMP). In addition to BMPs that focus on water quality and soil production, the interdisciplinary team also develops Project Design Features (PDF) with the objective of meeting other resource goals. For instance, the PDFs listed below under Wildlife and Vegetation are designed to meet resource objectives associated with these resources and not necessarily water quality. In addition, the PDFs listed under Recreation and Visual are designed to meet objectives stated in the RMP for these respective resources. The list below is not an exclusive list of BMPs or PDFs for the Chew Timber Sale. It is a list of the BMPs and PDFs that the interdisciplinary team found to be most pertinent for the proposed action. All of Appendix D as well as the Annual Program Monitoring Reports are used when developing the final operational specifications for a treatment.

Upland Forest Vegetation - Harvest Prescription

Regeneration Harvests

- Regeneration Harvests will occur on approximately 35 acres of the 1,200 total proposed harvest acres.
- Retain at least 16 to 25 large green trees per acre in regeneration harvest units (RMP – Plan Maintenance FY 1999 – page 23).
- Regeneration harvests would not be programmed for stands under 120 years of age and generally would not be programmed for stands under 150 years of age within the next decade unless required by deteriorating stand condition, disease, or other factors that threaten the integrity of the stand. Priority for harvest in stands under 150 years of age would be commercial thinning (Page E-10 of the RMP).
- Regeneration strategies would be planned to produce the highest probability of success at the lowest practical cost and will include provisions for species diversity and long-term site productivity within the design. Practices will be strongly influenced by consideration of ecological site potential, for retention of sufficient canopy to assure control of competing vegetation, by the requirements of owl habitat connectivity at the stand level, and by factors including growing season frost potential (Page E-10 of the RMP).
- Generally, Regeneration Harvests would be used when:
 - Mortality exceeds 40 percent of the canopy
 - Dead and dying trees are producing excessive fuel loads and increasing fire risks.
 - Regeneration of preferred species (pines and Douglas-fir) is necessary.
 - Large disease pockets are preventing the re-establishment of habitat.
 - To meet visual resource management objectives.

Density Management Harvests

- For uneven-aged stands, maintain a multi-strata stand structure.
- Thin around large old growth trees to improve vigor and reduce hazardous fuels risk.
- For stands with a basal area over 200 square feet per acre, thin to an average of 120 square feet per acre
- For stands with a basal area less than 200 square feet per acre, thin to an average of 90 square feet per acre.
- Generally retain the most dominant or co-dominant tree that is full crowned, vigorous, and disease free.

- Species selection priority: Sugar pine (highest), Douglas-fir, Ponderosa pine, Incense cedar, White fir (lowest).
- Retain (no thinning) isolated thermal clumps to provide variability in spacing and structure.

Patch Cuts

- No Patch Cuts are proposed in the treatment area.

Roads

- The BMPs listed in Appendix D of the RMP provide standard management practices that are to be implemented.
- Seasonally restricting renovation activities is recommended to eliminate sediment transportation to streams.
- Installing drainage dips in accordance with RMP BMPs to reduce surface and ditchline run-off is recommended.
- Apply mulch and seeding or other methods of soil stabilization to any exposed soil surfaces prior to the wet season to reduce surface erosion.
- Surfacing roads in accordance with RMP BMPs (*Roads C-1-8*) is recommended for all naturally surfaced roads not proposed for decommissioning or closure, to allow use during all seasons and is expected to minimize erosion from the road surfaces.
- Direction from the RMP ROD for Key Watersheds includes reducing road mileage and a no net increase in road mileage. Restoration of forest productivity including full decommissioning of roads within the riparian reserves upon completion of the project is recommended.
- Minimal or no grading of the existing roads will be done to maintain the existing ground cover and vegetation and to decrease sediment movement.
- Re-decommission roads that have been decommissioned but are opened for commercial treatments, non-commercial treatments, or prescribed fire use.
- When obliterating or fully decommissioning roads, remove road drainage features and fill in ditches, place slash and woody material on the road surface subsequent to ripping, and ensure that the road closure is adequate to ensure that vehicle access is eliminated.
- When obliterating or fully decommissioning roads within Riparian Reserves, plant native trees subsequent to road removal.

Soil Resources

- Limit detrimental soil conditions to less than 20 percent of the total acreage within the activity area. Use current soil quality indicators to monitor soil impacts. Sites where the 20 percent standard is exceeded will require treatment, such as ripping, backblading or seeding.
- To protect riparian areas, soil resources, and water quality while limiting erosion and sedimentation to nearby streams and drainages, do not allow logging operations during the wet season (October 15 to May 1).
- Limit mechanical cutting and yarding operations to periods when the soil moisture is below 20 percent at a six inch depth. Even lower soil moisture levels are preferable on fragile soils.
- Permit logging activities during this time period if frozen ground or sufficient snow is present. This is normally when snow depths are in excess of twenty (20) inches in depth.
- To protect soil resources and water quality, close unsurfaced roads during the wet season (October 30 to June 1) unless waived by authorized personnel.
- Residual slash will be placed upon skid trails upon completion of yarding.
- Avoid placement of skid trails in areas with potential to collect and divert surface runoff, such as the bottom of draws and ephemeral drainages.
- Retain and establish adequate vegetative cover in accordance with RMP BMP's to reduce erosion.

- Retain enough small woody (dead and down) material to sustain soil nutrients. See RMP BMP's for specifications. In ponderosa pine forest land, 9 tons per acre of duff and litter (approximately ½ inch deep).
- Seed and/or mulch exposed and disturbed soil surfaces with native seed when seed is available.
- Cable yarding and restricted use of mechanized equipment is required on slopes that are greater than 35 percent.
- Construct fireline by hand on slopes greater than 35 percent.
- Hand pile and burn within 100 feet of Riparian Reserves.

Hydrology & Riparian Reserve Treatments

Timber Harvest

- Delineate Riparian Reserve widths as described in the RMP (pg F-8, ROD pgs C-30 to 31).

Riparian reserve type	Reserve width
Seasonal non-fish-bearing streams and wetlands less than 1 acre and unstable or potentially unstable areas	<p>At a minimum, the reserve will include:</p> <ul style="list-style-type: none"> ▪The stream channel and the area extending to the top of the inner gorge; ▪The wetland and the area extending to the outer edges of riparian vegetation; ▪The area extending from the stream channel to a distance equal to the height of one site potential tree* (140 feet), or 100 feet slope distance, whichever is greatest; and, ▪The extent of stable or potentially unstable areas.
<p>*A site-potential tree is defined as the average maximum height of the tallest dominant trees (200 years old or more) for a given site class. In the Chew Timber Sale project area, the site potential tree height was determined to be 140 feet.</p>	

- For understory vegetation treatments within older, multi-age stands within Riparian Reserves, delineate “no-cut” buffers along stream channels and wetland areas. No-cut widths would be 20 foot on each side of non-fish bearing stream channels and wetlands.
- For vegetation treatments within Riparian Reserves, limit the use of mechanical equipment to the outer one-half of the Riparian Reserve.
- Existing landings and roads within riparian reserves would be used only if replacing them with landings and roads outside the riparian reserves would result in greater overall disturbance to the riparian reserve or water quality.
- Avoid placement of skid trails and landings in areas with potential to collect and divert surface runoff such as the bottom of draws and ephemeral drainages.
- Harvest/treatments methods that would disturb the least amount of soil and vegetation (yarding over snow or frozen ground, limiting activities to the dry season, pulling line to each tree, and minimizing skid trails) would be used in the Riparian Reserves.
- Consider retaining some downed logs for instream structural enhancement projects.
- No new permanent roads will be constructed within Riparian Reserves (except where construction or re-alignment of short road segments allows obliteration of longer road segments within Riparian Reserves).
- Yarding/skidding corridors that pass through Riparian Reserves will be designated prior to project implementation, will have a minimum spacing of 300 feet and be oriented perpendicular to streams, will have minimal relative slope, and will be revegetated following project implementation (as needed). Stream crossings will be selected at stable, naturally armored locations or will be armored with slash before being used as a corridor.
- Use of existing roads and landings within Riparian Reserves will be reviewed and approved by the Klamath Falls Resource Area interdisciplinary team.

- Mechanical treatments would be allowed in aspen stands only during periods when detrimental soil effects would be least likely to occur.

Fuels Reduction (Post-harvest)

Mechanical fuels treatments in riparian reserves:

- Treatments methods that would disturb the least amount of soil (yarding over snow or frozen ground, limiting activities to the dry season, pulling line to each tree, and minimizing skid trails) would be used in the Riparian Reserves.
- No ripping, piling, or mechanical site preparation (except for designated skid trails crossings, roads, or yarding corridors) would occur in RR's.
- To protect the thermal regime adjacent to streams and to maintain stream bank stability a no-mechanical-entry spacing for treatments would occur from the natural topographic break to the stream. In areas where a topographic break is not evident the following guidelines would be implemented: On intermittent streams with slopes less than 10 percent a 50 foot no entry buffer would be established on each side of the stream and on slopes greater than 10 percent an 80 foot no entry buffer would be established.
- Hand treatments would be recommended within the no-mechanical-entry zones in order to meet fuel management objectives.

Ignitions within riparian reserves:

- In general terms, ignition of broadcast fires should not occur within a minimum of 50 feet from the stream channel within the riparian reserves. The specific distance for lighting fires within the RR will depend on topography, habitat, ignition methods, and fuel moisture.
- Ignition line location nearest the stream should be based on topography and ignition methods and should be sufficient to protect water quality, CWD, and stream overhead cover. If it's wet don't pour fuel on it. If CWD directly touches the high water mark of the stream, or the CWD may be affected by high flows, don't ignite it. If there is a thick vegetation cover that extends out from the stream to the line of ignition then move the line of ignition into the forest stand, away from the stream.
- Recommend the ignition line location near large open meadows, associated with the stream channels, be located at the toe of the slope above the meadow elevation as much as possible in order to protect meadow vegetation.
- When igniting fuels on the lower end of the window of moisture content, increased ignition spacing from stream would be recommended to further protect CWD and overhead cover components.

Roads and temporary fire trail access in riparian reserves:

- Use of existing roads and landings within the RR will be reviewed and approved by the resource advisor.

Streamside pumping sites:

- Pumping on small streams should not reduce the downstream flow of the stream by more than half the flow.
- If possible avoid the construction of temporary pump chances, when necessary use temporary plastic dams to create chances and remove these dams when not actively pumping.
- Recommend that pump intake be suspended near the thalweg (deepest/highest quantity of flow) of the stream. Avoid placing pump intakes on the substrate or edges of the stream channel.

Post-fuels treatments for access roads and temporary fire trails:

- Installing drainage dips, or water bars, in accordance with RMP BMPs to reduce surface run-off is recommended.

- A layer of duff (average of ½ inch after final burn) will be retained to protect soil from erosion during the wet season.
- Mulch and seeding or other methods of soil stabilization are to be applied to any exposed soil surfaces prior to the wet season to reduce surface erosion.
- Surfacing roads in accordance with RMP BMPs (*Roads C-1-8*) is recommended for all naturally surfaced roads not proposed for decommissioning or closure.
- Design blockages (close or decommission) upon completion of treatments to minimize non-authorized use of roads and trails within treatment areas.
- Recommend placement of residual slash on trails upon completion of mechanical treatments.

Wildlife Terrestrial Species

Snag Retention

- Approximately 2.4 snags per acre will be retained with a minimum diameter at breast height (DBH) of 16", or largest available if less than 16" (RMP/ROD, Page 26-27).

Coarse Woody Debris (CWD)

- Approximately one hundred and twenty (120) linear feet of down logs per acre will be retained. Logs shall be greater than or equal to sixteen (16) inches in diameter and sixteen (16) feet long (RMP/ROD, Page 22).

Seasonal Restrictions

- Seasonal restrictions will be required where the following wildlife species are actively nesting: bald eagle, northern spotted owl, northern goshawk, osprey, and special status species. Seasonal restrictions for specific species can be found on pages 231-240 of the KFRA FEIS.

Nesting Areas

- Protect nesting areas as describe on page 38 of KFRA RMP.

For Fuel Treatment Units Adjacent To Or Containing Bald Eagle Nest Sites:

- No treatments will be planned within the core area (as identified by the BLM wildlife biologist) of a bald eagle nest site during the nest season. Nesting season is considered January 1st – August 15th. The wildlife biologist may adjust these dates if the young have fledged prior to Aug. 15th (usually the fledging date plus 2 weeks). The core area will consist of the withdrawn area around the nest and the disturbance area around the nest. Generally the disturbance area is considered ¼-mile or ½ mile line-of sight. This distance may vary depending on topography and site-specific information.
- Smoke management will be planned in such a way to avoid adverse effects of residual smoke on nest sites adjacent to burn units.
- A BLM wildlife biologist will be consulted about eagle use of the area before the fuel treatments are initiated to ensure the eagle situation is closely monitored.
- A biologist/designee will monitor the nest area during the burns to ensure that objectives and PDF's are met (smoke management, fire intensity, etc).
- In areas where prescribed fire activities are being planned, remove the brush, ladder fuels and large down woody debris within the dripline (approximately 30+ ft.) of the eagle nest trees and potential or identified perch/roost trees to reduce ladder fuel. The brush would be piled away from the nest and burned.
- So fire activity will be reduced immediately adjacent to the nest trees during the broadcast burning of the area, personnel will be required to complete one or more of the following:
 - Pull back of 10 and 100 hour fuels 30' from the base of the nest trees/ perch trees.
 - Construct fire line around the nest trees/perch trees.
 - Use foam, water, or other retardants to protect the nest tree (unless in a riparian zone).

- Ladder fuels would be removed from the dripline (30ft.)
- If the nest is occupied or spring burning is preferred because of excess fuel loading or to meet other resource objectives, then spring burning will not be allowed until site-specific discussions/consultations are completed with USFWS on this matter.
- Aircraft used during prescribed fire operations would maintain a buffer >1/2 mile distance from the nest during the nesting season (this distance may vary if topographical features allow). No buffer would be necessary outside the nesting season.
- In instances when verifying nesting status is necessary prior to activities taking place, survey protocols used by Oregon Eagle Foundation annual bald eagle survey flights would be followed.
- Fuel treatments can proceed in the core area, if no nesting has occurred by May 6 (last date documented for initiation of incubation, Frank Isaacs, personal communication)

For units adjacent to or containing spotted owls or NRF habitat:

- Burn prescriptions will require proper fuel moisture and atmospheric conditions so adequate large woody debris will be retained for prey habitat.
- General objective for burn would be to create a mosaic of burned and unburned habitat in the unit to maintain some habitat for prey production.
- In NRF habitat maintain visual screening along open roadways to minimize disturbance. In northern spotted owl NRF habitat, maintain the understory structure by retaining a diversity of the sub-merchantable understory conifer trees (Douglas -fir, white-fir, sugar pine, cedar, ponderosa pine). In mechanical treatment areas this would be done by site-specific designs described in the individual task orders. During prescribed fire activities the overall objective is to create a mosaic of burned and unburned areas. Ignition techniques and pull back on smaller trees may also be used to maintain the understory structure.
- Retain untreated areas ranging from ¼ acre to 5 acres (thermal clumps) within the treatment units to provide diversity for wildlife.
- During prescribed fire activities create a mosaic of burned and unburned areas to maintain a diversity of species and age classes of understory vegetation.
- Maintain habitat connectivity and corridors.

Noxious Weeds

- Require cleaning of all equipment and vehicles prior to moving on-site to prevent spread of noxious weeds. Also, if the job site includes a noxious weed infestation, require cleaning of all logging and construction equipment and vehicles prior to leaving the job site. 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 to clean the equipment.
- Mow noxious weeds in the immediate area of yarding operations to ground level prior to seed development.
- Conduct monitoring activities related to proposed treatments as described in the Klamath Falls ROD
- 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.

Special Status Species

- Provide snag mitigation measures for White-headed Woodpecker, Black-backed Woodpecker, Pygmy Nuthatch, and Flammulated Owl. Increase snag retention requirements from 1.9 to 2.5 snags per acre.

Cultural Resources

- Follow procedures for cultural protection and management outlined in the KFRA ROD/RMP (page 43), and protect identified sites by buffering.
- In accordance with guidelines and directives in the Klamath Falls Resource Area RMP, BLM regulations, and the National Historic Preservation Act, areas not included in previous archaeological surveys will be surveyed before any ground-disturbing action is undertaken.

Visual Resources

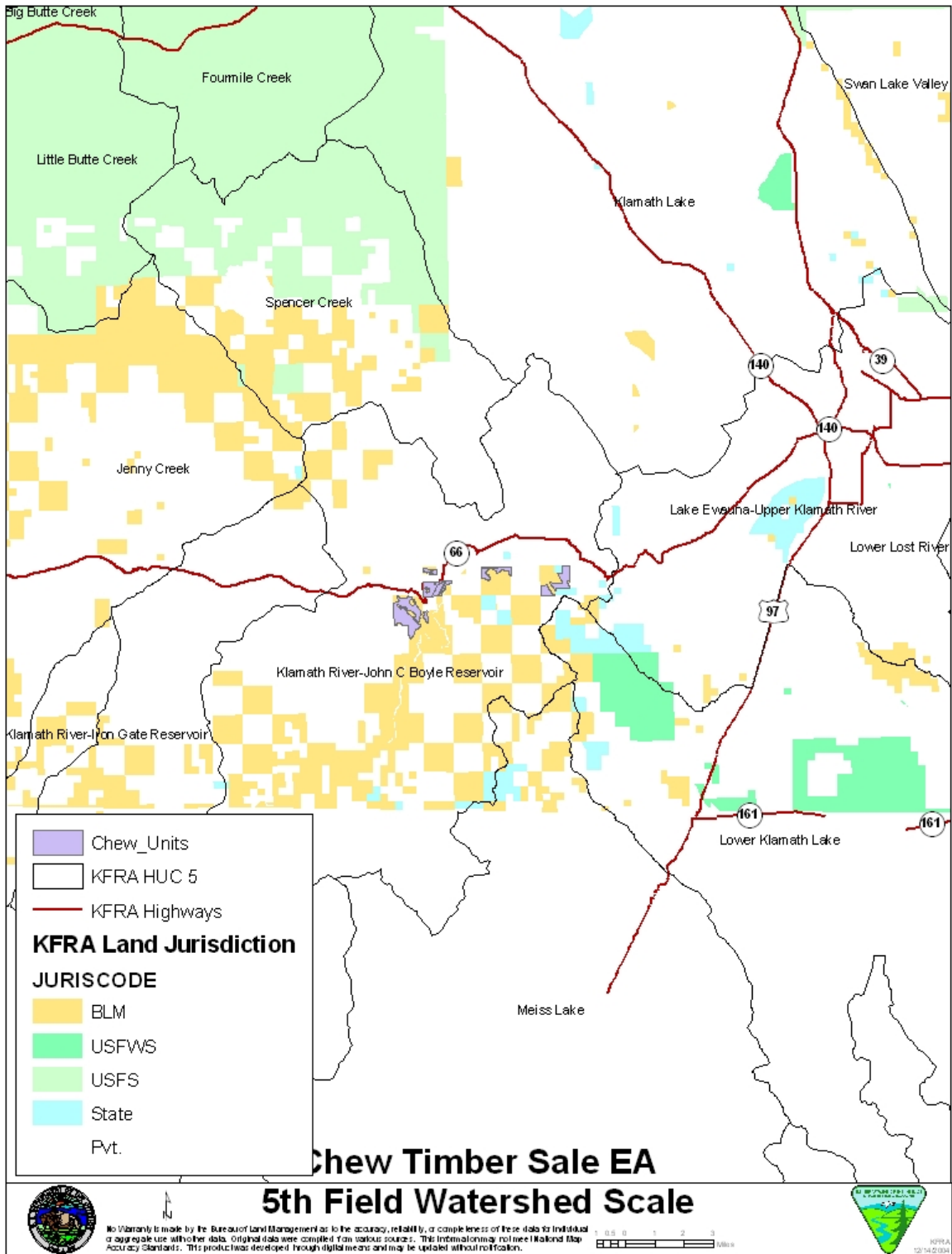
- Maintain scenic quality as follows along the access roads leading to the upper Klamath River canyon, (within the VRM class II area) and State Highway 66:
- Retain a variety of size classes of trees including large Ponderosa pine, Douglas fir and Incense cedar
- Small (hand) piles of slash dispersed for firewood gathering
- Avoid large landings/log decks, obvious skid trails and minimal ground disturbance near these major roads.
- Mechanical shearing and chainsaw cutting of small trees should be done as close to ground level as practical, to reduce negative visual impacts.
- The proposed regeneration harvest is not in the VRM class II area, or near major roads. However to reduce visual impacts and meet VRM class III standards, the regeneration harvest area should be designed with irregular shapes and avoiding linear lines, to mimic any nearby natural openings.
- Where possible, maintain visual screening along roadways.
- Within recreation sites, concentrated recreation use areas, or Special Areas, implement the following design features to reduce visual effects from harvesting:
 - Cut stumps close to ground (less than 4 inches).
 - Disperse small (hand) piles of slash for firewood use.
 - Minimize use of tree marking paint on trees identified for harvest.
 - Do not create large landings.
 - Minimize number of skid trails and amount of ground disturbance
 - Minimize damage to residual trees through careful timber falling.
- All treatments will meet appropriate Visual Class objectives specified in the KFRA ROD/RMP (page 44).

Recreation Resources

- Ensure that purchaser signs haul routes to alert recreationists to truck traffic in the area. Highway flaggers may be needed to warn traffic along Highway 66 of operations.
- Ensure that dust abatement and frequent grading occurs on haul routes, especially near more popular recreation areas such as Topsy campground and access to the upper Klamath River, or other parking/staging areas.
- Coordination between snowmobile operations and winter time harvesting operations will be done annually.
- In addition, the haul route shall be signed to caution users that log truck traffic is occurring along the road.
- During any winter harvesting operations, all subcontractors working in the Contract Area shall be advised of snowmobile traffic.

Appendix C – Project Maps

Map 1: Fifth Field Watershed Scale



Map 2: Roads and Streams

