

FINDING OF NO SIGNIFICANT IMPACT(FONSI)
for the
Topsy/Pokegama/Hamaker Fuel and Health Treatment
Klamath Falls Resource Area - Lakeview District
Environmental Assessment #OR-014-02-03

The Bureau of Land Management, Lakeview District, Klamath Falls Resource Area, has analyzed the Topsy/Pokegama/Hamaker Fuel and Health Treatment Environmental Assessment containing the following proposal and their alternatives related to:

- Fuel Modification
- Forest Health Improvement

Based on the information within the Environmental Assessment, it is my determination that none of the alternatives analyzed constitutes a significant impact affecting the quality of the human environment greater than those addressed in the:

- Final Klamath Falls Resource Area Resource Management Plan and Final Environmental Impact Statement (RMP/FEIS, September 1994) and its Record of Decision (ROD, June 2, 1995).
- Final Klamath Falls Resource Area Resource Management Plan and Final Environmental Impact Statement (RMP/FEIS, September 1994) and its Record of Decision (ROD, June 2, 1995).
- Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl. [April 1994. Also known as Northwest Forest Plan (NFP)].
- Topsy/Pokegama Landscape Analysis (TPLA, July 1996).
- Klamath Falls Resource Area Fire Management EA#-OR014-94-09 (June 10, 1994)
- Klamath Falls Resource Area Integrated Weed Control Plan EA (July 21, 1993).
- Range Reform FEIS (August 1995)
- Standards For Rangeland Health And Guidelines For Livestock Grazing Management For Public Lands Administered By The Bureau Of Land Management In The State Of Oregon And Washington. (August 12, 1997).
- Final Environmental Impact Statement, Vegetation Treatment On BLM Lands In Thirteen Western States (1991).
- Interior Columbia Basin Ecosystem Management Project / Eastside Draft Environmental Impact Statement / May 1997 (ICBEMP). We have reviewed the direction of the preferred alternative in ICBEMP and feel that the proposed action meets the intent/general direction of that alternative. The final decision for ICBEMP could amend direction in this EA; however, the NFP standards and guides take precedence over ICBEMP decisions.

Impacts to the environment would be similar to or less than those disclosed in the above mentioned documents. Therefore, it is my decision that an Environmental Impact Statement is not necessary and will not be prepared.

Signed: Teri Raml

Teri Raml, Field Manager
Klamath Falls Resource Area

Date: 8/19/02

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
LAKEVIEW DISTRICT
EA COVERSHEET

RESOURCE AREA: Klamath Falls

FY& EA #: OR-014-02-03

ACTION/TITLE: Topsy/Pokegama/Hamaker Fuel and Health Treatment

LOCATION: Klamath Falls Resource Area

FOR FURTHER INFORMATION CONTACT:

Gabi Sommerauer
Klamath Falls Resource Area, BLM
2795 Anderson Avenue, Bldg. 25
Klamath Falls, OR 97603
541-883-6916

FREEDOM OF INFORMATION ACT AND RESPONDENT'S PERSONAL PRIVACY 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.

Environmental Assessment No. OR-014-02-03

for

**TOPSY/POKEGAMA/HAMAKER FUEL
AND HEALTH TREATMENT**

Klamath Falls Resource Area – Lakeview District
Klamath Falls, Oregon

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Topsy/Pokegama/Hamaker Fuel and Health Treatment

Introduction:

This environmental assessment (EA) addresses fuels and slash abatement treatments for the enhancement of forest health and the reduction of the threat of a catastrophic wildfire. The 4,000 acre analysis area includes Bureau of Land Management (BLM) Klamath Falls Resource Area lands south of State Highway 66 (see proposed locations) excluding lands within the Wild and Scenic Corridor of the Klamath River Canyon. Also included in this analysis are 700 acres north of State Highway 66 on BLM lands.

Past management practices including logging and aggressive fire suppression have altered stand structure and densities, fuel loads, and species composition in the analysis area. As tree density in a forest stand increases, so does intertree competition for resources (Oliver and Larson 1990). Trees become more susceptible to disease and insect attacks, as they are unable to secure the resources needed for growth and maintenance. This in turn increases the fire risk by increased fuel loading from dead trees, both standing and on the ground.

Proposed Activity:

Mechanical severing, grinding, chipping or mowing will be used to thin and/or modify excessive levels of hazardous fuels including hardwoods, brush, juniper and sub-merchantable conifers (up to 6" dbh). This type of vegetation takes away growing space from mature trees and provides ladder fuels posing a threat to adjacent leave trees. Brush fields will be mowed to within six inches of the ground and woody debris broken up and lowered to the litter layer.

Mechanical grinding of sub-merchantable conifers and the grinding and mowing of brush in established plantations will control stocking, reduce competition and fuel hazard.

Firewood collecting would be allowed for the public, and non-profit ventures in areas easily accessible and only within 300' of established roadways.

Hand felling and hand piling would be used in areas not accessible to mechanical equipment and in areas sensitive to disturbance by mechanical equipment. This procedure would be followed by burning of the piles and possible planting of brush or pine seedlings in nonstocked cleared areas. Planting would include placing tubing over the seedlings to protect them in deer winter range areas until they are established.

Proposed treatments would focus on improving forest health, maintaining habitat for native plant and animal species, enhancing the residual pine component in some areas, and protecting riparian and other areas by reducing the general fire hazard.

Proposed Locations:

T. 39S R. 5E, Sections: 29, and 31.

T. 40S R. 5E, Sections: 7.

T. 40S R. 6E, Sections: 1,3,11,12, and 14.

T. 40S R. 7E, Sections: 5,11,15,22,23, and 27.

T. 41S R. 7E, Sections: 5.

See also attached maps.

Purpose and Need for Action:

Past management practices and aggressive fire suppression have created stands that are debris laden, overstocked with seedlings, sub-merchantable trees and a large brush component creating ladder fuels. This has created hazardous fuel conditions increasing the risk of a catastrophic wildfire.

According to the Topsy/Pokegama/ Landscape Analysis, p 32: At present, scientific research suggests that many contemporary eastside forests are out of balance ecologically compared to pre-settlement or even turn-of-the-century forests: that is, they are more prone to catastrophic disturbance and less able to retard the spread of disease and insects (Hessburg et al. 1994, Perry 1994). Higher tree densities, replacement understories of Douglas-fir and white fir, and the loss of the ponderosa, sugar and western white pine component in eastside forests have created conditions predisposing eastside forests to increased risk of catastrophic wildfire, virulent disease centers, and insect outbreaks.

Stands within the analysis area are characteristic of stands within the Lower Spencer Creek area where the following concerns were raised. In the Lower Spencer Creek Forest Health Treatments Environmental Assessment, OR014-96-02 (Lower Spencer Creek EA), the forest stands within the matrix were described as follows: *Many of the forest stands in the proposed project area can be generally described as multi-aged, multiple canopy stands. Many of the stands that are proposed for treatment contain a residual large tree overstory component of pines, Douglas fir and true firs, and a dense, stagnated understory component of true firs. Past management practices coupled with the suppression of natural fire have contributed to the overstocking primarily of the understory. This has contributed to a decline in forest health (stand resiliency) and an increased fire hazard in some forested areas. Forest health in this EA is defined as the resiliency of the residual stands to sustain themselves in the process of natural disturbances such as insect outbreaks and wildfire. A more detailed discussion of forest*

health can be found in the Spencer Creek Pilot Watershed Analysis, pages 4-18 to 4-56, and in the Final Klamath Falls Resource Area Management Plan and Environmental Impact Statement, September 1994 (KFRA FEIS), pages 3-63 to 3-66.

Objectives:

Modify and/or reduce ground and ladder fuels by severing, grinding and mowing of small diameter trees, excessive down woody debris, and brush to lower the risk of major ecosystem losses due to catastrophic wildfires.

Improve forest health and reduce competition to desirable species.

Improve forest health by thinning established plantations and overstocked stands, opening the canopy, reducing competition and encouraging increased stand vigor by making more nutrients, water and light available to the residual trees. Trees able to secure the resources needed for growth and maintenance are less susceptible to disease and/or insect attacks.

Reducing the brush component will increase overall stand vigor by reducing competition making the stand less susceptible to insect and disease attack. A detailed analysis on insect and disease can be found in the Topsy Pokegama Landscape Analysis page 27-34.

Conformance with Land Use Plans

The proposed treatments are being planned under the following management direction:

- C Final Environmental Impact Statement, Vegetation Treatment On BLM Lands In Thirteen Western States (1991).
- C Final Klamath Falls Resource Area Resource Management Plan and Final Environmental Impact Statement (RMP/FEIS, September 1994) and its Record of Decision (ROD, June 2, 1995).
- C Final Supplemental Environmental Impact Statement (FSEIS) on Management Habitat for Late-Successional and Old Growth Forest Related Species Within the Range of Northern Spotted Owl (February 1994).
- C Interior Columbia Basin Ecosystem Management Project / Eastside Draft Environmental Impact Statement / May 1997 (ICBEMP). We have reviewed the direction of the preferred alternative in ICBEMP and feel that the proposed action meets the intent/general direction of that alternative. The final decision for ICBEMP could amend direction in this EA; however, the NFP standards and guides take precedence over ICBEMP decisions.

- Ⓒ Klamath Falls Resource Area Fire Management EA#-OR014-94-09 (June 10, 1994).
- Ⓒ Klamath Falls Resource Area Integrated Weed Control Plan EA (July 21, 1993).
- Ⓒ Pokegama Cooperative Habitat Project (February 1991).
- Ⓒ Range Reform FEIS (August 1995).
- Ⓒ Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl. [April 1994. Also known as Northwest Forest Plan (NFP)].
- Ⓒ Standards For Rangeland Health And Guidelines For Livestock Grazing Management For Public Lands Administered By The Bureau Of Land Management In The State Of Oregon And Washington. (August 12, 1997).
- Ⓒ Topsy/Pokegama Landscape Analysis (TPLA, July 1996).

Alternatives

Alternative A (Proposed Action) - Modification of ground fuels and ladder fuels.

Under this alternative up to 4,000 acres within the analysis area would be treated (See Map 1 A). This alternative proposes a combination of mechanical treatments (including shearing, slashing, grinding, or mowing) and manual treatment consisting of hand felling, piling and burning of the piles.

Juniper, brush, and shrubs would be treated by either mowing or grinding with a slashbuster or similar mechanical equipment. In areas not accessible to mechanical equipment and selected areas, hand methods would be applied. Submerchantable conifers (up to 6" dbh) would be treated by either shearing, mowing, grinding or by hand-felling and piling. Submerchantable conifers would be thinned to an approximate spacing of 16' X 16', this spacing maybe adjusted to fit specific site conditions. Generally sugar pine (*Pinus lambertiana*), ponderosa pine (*Pinus ponderosa*), Douglas-fir (*Pseudotsuga menziesii*) would be favored. According to Leiberg (Topsy /Pokegama Landscape Analysis, p 32) these were the dominant species in the analysis area at the turn of the century. Public firewood cutting would also be permitted in accessible areas. All public activities would be restricted to areas within 300 feet of established roads. However, no cutting or removal of sawtimber would occur unless analyzed in a site-specific environmental analysis.

Alternative B (No Action)

Under the No Action alternative, no new treatments would be implemented. Current management of the proposed project area would remain the same.

Affected Environment

Cultural Resources

Portions of the proposed treatment areas have been surveyed for cultural resources using BLM Class III survey methods (see Table 1). Approximately 70 percent of lands included within potential fuel treatment area (Alternative A) have been surveyed. The remaining portions of the proposed treatment areas that have not been inspected will be surveyed prior to any ground-disturbing activity. Identified sites will be buffered, and the areas within the buffers will not be treated.

Table 1: Summary of Cultural Resource Survey History Within Proposed Project Areas.

Cultural Resource Survey Name	KFRA Report Number	Number of Cultural Sites Identified	Cultural Survey Status
KFRA Inventory	OR014-CRR-FY97-009	3	Fuel treatment areas surveyed and cleared.
Grenada Timber Sale and Underburn	OR014-CRR-FY96-006	7	All BLM-administered land surveyed and cleared.
Grenada Plus	OR014-CRR-FY90-009	4	Fuel treatment areas surveyed and cleared.
Archaeological Survey of BLM Lands	OR014-CRR-FY97-008	17	Fuel treatment areas surveyed and cleared.
Muddy Tom Compilation	OR014-CRR-FY97-014	5	Fuel treatment areas surveyed and cleared.
Slim Chicken	OR014-CRR-FY98-009	0	Survey needed in T. 40 S., R. 7 E, Sections 19, 21, and 29.
Wild Gal spring	OR014-CRR-FY97-002	4	All BLM-administered land surveyed and cleared.
Topsy/Dorris	OR014-CRR-FY97-010	6	Fuel treatment areas surveyed and cleared.
Chase-Hamaker	OR014-CRR-FY99-019	1	Survey needed in T. 40 S., R. 7 E., Sections 11, 15, 22, and 23.

The analysis area is known to contain prehistoric and historic cultural resources. 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 within the analysis area, bisects the Topsy/Pokegama/Hamaker 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 our area of analysis, was apparently associated with seasonal rounds conducted for subsistence needs.

Early historical use of the area centered on trapping and lumber industries. This area helped support a large mill at Klamathon (California), which burned in 1903. Initially, log rafting drives were conducted along the Klamath River to feed the Klamathon lumber mill. A logging chute was constructed connecting the Pokegama Plateau with the river. The Klamath Lake Railroad, which reached from Klamathon into the woods in the area of Camp Four, eventually replaced the log rafting drives. Early historic towns and mills in the analysis area include Snow, Pokegama, and Dixie. This area was also crossed by numerous early and important travel routes including the Applegate Trail, Southern Oregon Wagon Road, Topsy Road, and Ward Road.

Additional information about cultural resources in the analysis area may be found in the Topsy/Pokegama Landscape Analysis (pages 169-171) and *Prehistory and History of the Jackson-Klamath Planning Unit: A Cultural Resources Overview* (Follansbee and Pollock, 1978).

Actions in areas immediately adjacent to the Klamath River Canyon rim are likely to be of concern to The Klamath Tribes and the Shasta (Quartz Valley Reservation). The Klamath Tribes do not have any federally recognized treaty rights within the analysis area, since it is outside their former reservation boundary. However, because The Klamath Tribes have concerns about land use decisions that may have potential to damage cultural sites/landscapes, the BLM informs Tribes about proposed management in the general area. Members of the Quartz Valley Tribe also have an interest in cultural sites in the Klamath River Canyon and immediately adjacent areas. Currently, both The Klamath and Quartz Valley Tribes are working together to help prevent further damage to cultural sites within the Klamath River Canyon. Some members of the Quartz Valley Tribe trace their ancestry back to the Shasta Nation who inhabited portions of the Klamath River Canyon. Consequently, members of the Quartz Valley Tribe of Shasta descent may be concerned with actions performed along and near the canyon rim.

Hydrology/Riparian

Hydrology

Streamflow

The analysis area includes portions of the Jenny Creek and Middle Upper Klamath River watersheds. Under the Aquatic Conservation Strategy of the Northwest Forest Plan, the Jenny Creek watershed is designated as a Tier 1 Key Watershed.

Major streams in or near the analysis area include (from west to east, excluding the Klamath River) Bear Valley Creek, Hayden Creek, Tom Creek, Edge Creek, Long Prairie Creek, Fall Creek, and Sheepy Creek. Fall Creek and Sheepy Creek are tributary to Jenny Creek. Portions of some of these streams flow only intermittently. Other unnamed streams in the analysis area are generally ephemeral, although there may be portions that are intermittent or, near springs, perennial.

Hydrologic processes in these streams have been affected by past and ongoing management activities. These are discussed in the relevant watershed analyses (BLM 1996, pages 75 to 91; BLM 1995, pages 79 to 85).

Water Quality

Fall Creek is the municipal watershed for Yreka, California. The diversion point for the city's treatment plant is downstream from the Fall Creek hydroelectric facility. Most of the flow at this location originates as high quality springflow.

Water quality of streams in the analysis area varies considerably. Johnson Creek is included on the 1998 Oregon DEQ 303(d) list of water quality impaired streams for exceedance of the summer water temperature standard, while observations suggest that Long Prairie Creek may have excess fine sediment. BLM macroinvertebrate data (Biotic Condition Index analysis, from 1993 to 1997) suggests that Hayden Creek (at T 41S, R 5E, section 1) is in "poor" to "fair" condition and Long Prairie Creek (at T 41S, R 5E, section 5) is in "poor" condition.

Degraded water quality in the analysis area is likely a result of grazing, timber harvest, and road construction. In addition to the direct effects of reduced shading and increased sediment delivery, indirect effects (such as bank erosion and channel widening) also affect water quality. Water quality conditions also reflect natural conditions, such as clay rich soils, low streamflows, and southerly aspects.

Riparian Reserves

Riparian reserves are designated adjacent to streams and potentially unstable areas where special standards and guidelines direct land use. These reserves include those portions of the watershed that are required to maintain the hydrologic, geomorphic, and ecologic process that directly affect fish habitat and standing and flowing water.

Under the Aquatic Conservation Strategy (ACS), riparian reserves are used to maintain and restore riparian structures and functions, confer benefits to riparian-dependent and associated species, enhance habitat conservation for organisms that are dependent on the transition zone between upslope and riparian areas, improve travel and dispersal corridors for many terrestrial animals and plants, and provide for greater connectivity of the watershed.

Riparian reserve widths for various types of waterbodies are based on the height of a site potential tree (see Table 2). In the Klamath Falls Resource Area, this is equivalent to 140 feet on lands south of Highway 66, and 160 feet for lands north of Highway 66.

Table 2: Riparian reserve types and widths within the KFRA.

Riparian reserve type	Reserve width
Fish-bearing streams, including the Klamath River	The height of two site potential trees
Perennial non-fish-bearing streams	The height of one site potential tree
Seasonal non-fish-bearing streams <i>and</i> wetlands less than 1 acre <i>and</i> unstable or potentially unstable areas	At a minimum, the reserve will include: ?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, or 100 feet slope distance, whichever is greatest; and, ?The extent of stable or potentially unstable areas.
Constructed ponds and reservoirs <i>and</i> wetlands greater than one acre	At a minimum, the reserve will include: ?The body of water or wetland and the area to the edges of riparian vegetation; ?The extent of seasonally saturated soil; ?The extent of unstable or potentially unstable areas; ?To a distance equal to the height of one site potential tree; and, ?To 140 feet slope distance from the edge of the wetland or the maximum pool elevation of constructed reservoirs.
Lakes and natural ponds	At a minimum, the reserve will include: ?The body of water or wetland and the area to the edges of riparian vegetation; ?The extent of seasonally saturated soil; ?The extent of unstable or potentially unstable areas; ?To a distance equal to the height of two site potential trees; and, ?To slope distance equivalent to the height of two site potential trees from the edge of the body of water.
Springs	Reserve widths vary according to the size of the associated wetland (see above).

Within the analysis area, the extent of features for which riparian reserves would be delineated is not known. Generally, vegetation communities adjacent to watercourses within the analysis area are a mix of riparian and upland species. The forest health concerns that affect forested vegetation communities are also relevant to upland vegetation types within riparian reserves, especially along ephemeral and intermittent streams (BLM 1996, page 105).

Fisheries

One fish bearing stream and one potentially fish bearing stream occur adjacent to treatment units. Sheepy Creek is a tributary to Johnson creek, and is part of the Jenny Creek watershed. Recently, the section of Sheepy creek near the treatment unit 39S-5E-29 was surveyed using ocular methods. Klamath speckled dace were documented. Within the Jenny Creek watershed, Jenny Creek redband trout and Jenny Creek smallscale sucker are known to occur (Jenny Creek watershed Analysis 1994). Jenny Creek smallscale sucker is listed as a species of concern by ODFW and is managed as Bureau Sensitive (BLM Manual 6840, ONHP 2001).

Bear Valley Creek flows historically connected to Lower Klamath Lake, though much of the connectivity has been eliminated with the development of Lower Klamath Lake for commercial purposes. Recently, the section of Bear Valley creek near the treatment unit 40S-7E-11 was surveyed. Fisheries biologists have reviewed the stream channel, adjacent to the unit and more than one mile downstream. Fish presence was not documented, however based on the drainage size, the volume of flow noted during the survey, and the conditions of aquatic and riparian habitat surveyed, the potential exists for portions of this stream to be fish bearing. No complete barriers to migration were noted during the field review, along the full length of stream surveyed. However, head cutting of the channel occurring downstream of the affected unit were noted that might limit the distribution of fish species within the upper portions of the drainage.

The fish species in Bear Valley creek potentially present would be Klamath speckled dace, Klamath redband trout, and sculpin species (Table 3). Sculpin and speckled dace do not have an associated status but are native to the Klamath Basin. Klamath redband trout is listed as a species of concern by ODFW and is managed as Bureau Sensitive (BLM Manual 6840, ONHP 2001).

Table 3: Fish species suspected or known to be present in or directly adjacent to the project planning areas.

Common Name	Scientific Name	Present (P) Suspected (S)
Sculpin sp.	<i>Cottus sp.</i>	S
Jenny Creek redband trout	<i>Oncorhynchus mykiss ssp.</i>	S
Jenny Creek smallscale sucker	<i>Catostomus rimiculus ssp.</i>	S
Klamath redband trout	<i>Oncorhynchus mykiss ssp.</i>	S
Klamath Speckled Dace	<i>Rhinichthys osculus</i>	P
Lamprey sp.	<i>Lampetra sp.</i>	S
Fathead minnow	<i>Pimephales promelas</i> (introduced)	S

Range

Cattle

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

Ⓒ **Dixie Allotment** (#0107) - 91 head from 5/1 to 8/15.

Ⓒ **Chicken Hills Allotment** (#0141) - 20 head from 5/15 to 9/15 (plus 100 head exchange-of-use for intermingled private lands).

Ⓒ **Edge Creek Allotment** (#0102) - approx. 80 head from 5/1 to 7/15 (plus several hundred head exchange-of-use for intermingled private lands).

In 1993, Weyerhaeuser (now U.S. Timberlands) canceled all of their grazing leases in the analysis area, reducing overall grazing use by 80 percent. Their stated reason for the cancellations was to protect riparian and wetland areas on their lands. This cancellation caused the full revoking of three BLM grazing leases - Chase Mountain (0101), Dry Lake (0140), and the North and Edge Creek pastures of Edge Creek, since these grazing leases were linked to the Weyerhaeuser lands as recognized base property. The two Edge Creek pastures were recently re-leased for grazing use beginning in 2001; the other allotments are still in non-use.

For a complete description of the grazing allotments, including historic and current use levels, allotment boundaries, and current range conditions, reference the Topsy/Pokegama Landscape Analysis (TPLA - pages 135-154). Additional information is in the Klamath Falls Resource Area FEIS, RMP/ROD, and Rangeland Program Summary.

Wild Horses

The Pokegama wild horse Herd Management Area (HMA) is within the portion of the analysis area located west and north of the Klamath River Canyon. According to the TPLA, the number of wild horses in 1995 (estimated at 50-75) was causing periodic overutilization of localized riparian areas and meadows along unenclosed portions of Long Prairie Creek and near Wild Gal Spring. As a result, the TPLA recommended reducing the herd size to meet the Wild Horse Act (1971) objective of 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 Appropriate Management Level (AML) for the Pokegama HMA (30 to 50 head) was analyzed and determined in the RMP and affirmed in EA #OR-010-95-10 and the TPLA. In 1996 and 2000, 20 and 18 head of horses respectively, were trapped and removed from the herd area. Recent (February 2002) horse census counts indicate a current herd size of 30-40 head, which is well within the appropriate management level.

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

Recreation

Recreational activities in the analysis area consist primarily of winter sports such as skiing and snow play, hunting, driving for pleasure, sightseeing, and mountain biking. The analysis area currently receives light dispersed use at most times of the year, except for holiday weekends, opening weekends of hunting and mushroom picking seasons, and in areas of concentrated use.

Hamaker Mountain, which is within the analysis area, was identified in the Klamath Falls Resource Area RMP as a potential Special Recreation Management Area (SRMA). A SRMA denotes an area requiring more substantial recreation investment and/or intensive recreation management. The Hamaker-Chase Mountain area is used for a variety of winter sports activities such as shuttle assisted downhill skiing and snowboarding, cross country skiing, snow play activities, and riding snowmobiles. For additional detail about recreational resources in the analysis area, reference the TPLA (pages 173-179).

Visual Resources

BLM lands within the analysis area are classified and managed in Visual Resource Management (VRM) classes II, III, or IV. The VRM class II objective is to retain the existing character of the landscape. Management activities should not attract the attention of the casual observer. Class III objectives are to partially retain the existing character of the landscape. Under class IV VRM management, major modifications to the existing character of the landscape, as a result of management activities, are allowed to occur. BLM lands in the analysis area are classified and managed for VRM as follows;

- C VRM Class 2 – All of the lands below the rim in the Klamath River Canyon.
- C VRM Class 3 - The lands in the Hamaker and Chase mountain area, all of T40S R7E.
- C VRM Class 4 - Hayden Creek and Edge Creek subwatersheds.

Sensitive Plants

Botanical resource surveys for vascular plants of proposed units within T40S R7E and T41S R7E were conducted in 1998. Botanical resource surveys for vascular plants of units within T40S R6E section 11 and T40S R5E were conducted in 1996. No special status vascular plant populations were found in proposed treatment units during these surveys. Units within T40S R6E sections 1, 3, 12, and 14, and T39S R5E will be surveyed for botanical resources in 2002.

Noxious Weeds

Botanical resource surveys for vascular plants of units within T40S R7E and T41S R7E were conducted in 1998. Botanical resource surveys for vascular plants of units within

T40S R6E section 11 and T40S R5E were conducted in 1996. Units within T40S R6E sections 1, 3, 12, and 14, and T39S R5E will be surveyed for botanical resources in 2002.

One known site of St. John's wort (*Hypericum perforatum*) occurs in T40S R6E Section 11, and one known site of tansy ragwort (*Senecio jacobaea*) occurs in T40S R5E Section 7. Diffuse knapweed (*Centaurea diffusa*) was found in T40S R7E sections 5 (6 sites), 15 (1 site BLM, 1 site private), 22 (1 site), and 23 (1 site). St. John's wort was also found in T40S R7E section 11 (1 site BLM, 2 sites adjoining private).

Soils

The dominant soil types in the analysis area belong to the Woodcock-Pokegama complex. This complex covers over 50 percent of the analysis area. It is characterized by deep or very deep, well drained soils on hillslopes. The permeability rates range from slow to moderate. Runoff is moderate, as is the hazard of water erosion. These soils are suited for the production of Douglas-fir and ponderosa pine. Compaction is a danger when soils are moist. Puddling can occur when soils are wet. See Table 4 below for a list of the soil series within the analysis area, including their sensitivity to treatment. (USDA SCS, 1993)

Sensitive soils types make up a relatively small amount of the analysis area. A map showing the sensitive areas should be consulted during the layout of the actual treatment units. Some of the treatments units should be modified to remove sensitive soil areas from the project area. Many of these areas are sensitive due to steep and/or rocky slopes. These slopes may not be operational for machinery. Other soils are sensitive due to seasonal wetness or flooding. (USDA SCS, 1993) The following is a brief discussion of the sensitive soils found in the analysis area.

Woodcock stony loam, 35 to 55 percent south slopes and Greystoke stony loam, 35 to 55 percent south slopes are both of concern because of their potentially steep slopes. Their permeability rate is moderate to moderately slow respectively. Runoff is rapid and the hazard of water erosion is high for both of these soil series. Removal of large amounts of native vegetation could leave these areas more susceptible to erosion, especially on the steeper slopes. (USDA SCS, 1993)

Skookum-Rock outcrop-Rubble land complex, 35 to 70 percent slopes are moderately deep and well drained. This area is made up of exposed bedrock, stones and boulders. Permeability is slow and runoff is rapid. The risk of water erosion is high. Vegetation consists of grasses, shrubs, forbs, and scattered hardwoods. This area may not be suited to the use of machinery due to steep slopes and rockiness. Consideration should also be given before using hand vegetation treatments in these areas. Removal of large amounts of native vegetation could leave the area more susceptible to erosion, especially on the steeper slopes. (USDA SCS, 1993)

Klamath silt loam, 0 to 1 percent slopes are very deep, poorly drained soils on flood plains. These areas should be removed from the project units. Vegetation is comprised of grasses, sedges, and forbs. Permeability is slow, runoff is slow, and there is a slight water erosion hazard. This soil is often flooded for long periods during the spring. There is a high risk of compaction when the soil is wet. Compaction of this soil may result in excessive runoff. Use of machinery should be restricted in these areas particularly during high soil moisture (>20% by weight). If there is no vegetation requiring treatment these areas should be restricted from unnecessary machinery traveling through this area. It would be preferable, if treatment is required, to consider hand treatments to reduce compaction risks. (USDA SCS, 1993)

Kanutchan clay, 1 to 8 percent slopes is a deep, somewhat poorly drained soil in wet meadow basins. The permeability rate is very slow, runoff is slow, and there is a slight water erosion hazard. Vegetation includes grasses, sedges, and forbs. These areas are seasonally wet. There is a high risk of compaction when the soil is wet. Compaction of this soil may result in excessive runoff. Use of machinery should be restricted in these areas particularly during high soil moisture (>20% by weight). If there is no vegetation requiring treatment, these areas should be excluded from unnecessary machinery traveling through this area. It would be preferable if treatment is required to consider hand treatments to reduce compaction risks. (USDA SCS, 1993)

Table 4: Soil Series By Area (USDA SCS, 1993)

Soil Series	Setting	Acres	% of project area	Sensitivity
Woodcock-Pokegama complex (204E)	12 to 35 percent north slopes	1060	27%	Moderate
Woodcock-Pokegama complex (205E)	12 to 35 percent south slopes	1024	26%	Moderate
Pokegama-Woodcock complex (147C)	1 to 12 percent slopes	709	18%	Low
Greystoke-Pinehurst complex (79E)	12 to 35 percent north slopes	386	10%	Moderate
Pinehurst-Greystoke complex (145C)	1 to 12 percent slopes	348	9%	Low
Woodcock stony loam (203F)	35 to 55 percent south slopes	159	4%	Water Erosion Hazard-HIGH
Greystoke-Pinehurst complex (80E)	12 to 35 percent south slopes	126	3%	Moderate
Bly-Royst complex (13C)	1 to 12 percent slopes	75	2%	Moderate
Greystoke stony loam (78F)	35 to 55 percent south slopes	62	2%	Water Erosion Hazard-HIGH

Skookum-Rock outcrop-Rubble land complex (174G)	35 to 70 percent slopes	46	1%	Water Erosion Hazard-HIGH
Klamath silt loam (99A)	0 to 1 percent slopes	4	<1%	Seasonally Wet/Compaction Risk
Kanutchan clay (96B)	1 to 8 percent slopes	1	<1%	Seasonally Wet/Compaction Risk

Survey and Manage Species

Introduction

Survey and Manage species and their categories are listed in Table 1-1 of the 2001 Annual Species Review, released June 13, 2002. Reference the 1994 Northwest Forest Plan and the 2001 ROD for further information on Survey and Manage species and Survey Protocols. Maps and information on the areas surveyed can be found in the project binder.

Fungi

Several species of Survey and Manage fungi species have been found during previous surveys in lands adjacent to the proposed project area. No pre-disturbance surveys are necessary for fungi, however incidental finds will be managed as Known Sites. Table 1-1 from the 2001 Annual Species Review lists fungi species and their category.

Habitat for fungi is different on a species by species basis. Some fungi species require coarse woody debris others use duff, pinecones and litter as a substrate. Many fungi are dependent on specific tree species that act as mycorrhizal hosts. Fungi are sensitive to changes in microclimate conditions (light, wind, temperature, and moisture).

Terrestrial Mollusks

Terrestrial Mollusk Survey Protocol, Version 2.0 (October 29, 1997) requires that two passes be completed in the high priority habitat for the target species. As of April of 2002 neither of the two terrestrial mollusks have been found in the Klamath Falls Resource area.

- *Helminthoglyphia hertleini* (Oregon Shoulderband) Category E⁴ (Rare, Status Undetermined, pre-disturbance in priority habitat required).
Habitat: Generally associated with talus and other rocky outcroppings.
- *Pristoloma articum crateris* (Crater Lake Tightcoil) Category B^{2,4} (Rare, pre-disturbance surveys in priority habitat required).
Habitat: Greater than 610 meter elevation in moist conifer forest and mosses/other vegetation near wetland, springs, seeps riparian areas.

Aquatic Mollusks

Aquatic Mollusk Survey Protocol, Version 2.0 (October 29, 1997) requires that one survey is *Aquatic Mollusk Survey Protocol, Version 2.0 (October 29, 1997)* requires that one survey be conducted during suitable surveying conditions as described in the survey protocol. In general the visit must be made when there is not a high amount of turbidity or high water. *Fluminicola* sp. have been found on the Klamath Falls Resource area in the past.

- *Fluminicola* n. sp. 1 (Klamath pebblesnail) Removed from Category A, however Manage all known sites until disposition is clarified in the special status species category.
- *Fluminicola* n. sp 3 (Klamath Rim pebblesnail) *Category A*²
Habitat: Shaded areas in cold flows emanating from springs.
- *Fluminicola* n. sp. 16 (Shasta Springs pebblesnail) *Category A*
Habitat: Occurs only in springs usually with *Rorripa* sp. 744 to 915m.

Vascular Plants

Botanical surveys of proposed units within T40S R7E, T41S R7E, T40S R6E section 11, and T40S R5E found no populations of S&M vascular plant species, including the mountain lady slipper orchid (*Cypripedium montanum*), which has been documented elsewhere in the resource area. Units within T40S R6E sections 1, 3, 12, and 14, and T39S R5E will be surveyed for botanical resources in 2002.

Wildlife

For a list of common species in the proposed project area, reference the Klamath Falls Resource Area Draft RMP/ROD, Appendix 3C. A description of their habitats is located in the Topsy/ Pokegama Landscape Analysis (TPLA, pages 61-75) and the Klamath Falls Resource Area FEIS (pages 3-37 to 3-41).

Ungulates

The project area contains winter and transitional range (spring and fall) for Columbian black-tailed deer (*Odocoileus hemionus columbianus*). The area also supports a small population of year-round residents. Approximately 2,500 deer are estimated to use this area as winter range, which is a lower population than trends projected by ODFW. Population goals are set at 3,200 animals by ODFW for the Keno Unit that includes this analysis area.

Roosevelt elk (*Cervus elaphus*) use this area year-round, with concentrations much higher during the winter months. Elk populations continue to expand in the area since first noted 20 years ago. Elk probably moved into the area partially in response to favorable forage to cover ratios that resulted from past and current logging practices.

Furbearers

The bobcat (*Lynx rufus*), mountain lion (*Felis concolor*), and black bear (*Ursus americanus*) are known to occur in the area. Neither the American marten (*Martes americana*) or fisher (*Martes pennanti*) has been documented within the analysis area, nor do current habitat conditions favor their presence. The latter two species will not be discussed further in this document.

Bats

Several bat species (a complete list can be found in the TPLA pp. 67) may be found within the analysis area. Several of these may be considered sensitive. Table 4 lists the special status bat species that may occur within the proposed units.

Table 4: Current state and federal status for bats known to occur in the proposed area.

<u>Species</u>	<u>State Status</u>	<u>Federal Status</u>
Silver-haired bat	SU	-
Long-eared bat	SU	SC
Long-legged myotis	SU	SC
Fringed bat	SV	SC
Yuma bat	-	SC
Pacific pallid bat	SV	-

SV=Sensitive, vulnerable

SU=Sensitive, Unknown Status

SC = Species of Concern (Former Federal Candidate C2)

(Information compiled from the Oregon Natural Heritage Program Database, March 2001.)

Upland Birds

Wild turkeys (*Meleagris gallopavo*), California quail (*Callipepla californicus*), mountain quail (*Oreortyx pictus*), and blue grouse (*Dendragapus obscurus*) are found within the analysis area. The blue grouse is considered uncommon in the analysis area and is generally associated with mixed conifer forests. The introduced wild turkey has a small, but stable population. Regular releases by ODFW allowed the small population to establish. At present, ODFW has temporarily halted their release program in the project area. The California and mountain quail are both dependent on brushy areas with grassy openings that are often associated with or near an open-woodland.

Raptors

Several raptors (birds of prey) that are not considered special status species migrate through, and may nest within, the proposed project area.

Hawk species include the red-tailed (*Buteo jamaicensis*), Cooper's (*Accipiter cooperii*), sharp-shinned hawk (*Accipiter striatus*), and American kestrel (*Falco sparverius*). The Cooper's and sharp-shinned hawk are more closely associated with coniferous forest. The red-tailed hawk and American kestrel are generally more associated with open-woodlands. All of the above species primarily forage on birds and small mammals.

Owl species that may occur in the proposed project area include the great horned owl (*Bubo virginianus*), long-eared owl (*Asio otus*), northern pygmy owl (*Glaucidium gnoma*), and western screech owl (*Otus kennicottii*). The northern spotted owl (*Strix occidentalis caurina*) and great gray owl (*Strix nebulosa*) are discussed under special status species.

Woodpeckers

Several species, including the white-headed (*Picoides albolarvatus*), pileated (*Dryocopus pileatus*), hairy (*Picoides villosus*), downy (*Picoides pubescens*), red-breasted sapsucker (*Sphyrapicus ruber*), and northern flicker (*Colaptes auratus*) are known to occur in the area. These species all rely heavily on snags of varying sizes and decadal classes for foraging and nesting habitat.

Landbirds

Surveys for landbirds (primarily passerines) within the Topsy Pokegama Watershed were conducted between 1998 and 2001. Habitats, which would be most directly affected by the proposed project, include shrub habitats and the sapling/pole stages of forest habitats. Landbird species generally associated with these habitat types (based on Andelman and Stock 1994, and Saab and Rich 1997) that have been documented in the area are listed in Table 5. Other species associated with seedling/shrub and sapling/pole stages of coniferous forest that could occur in the area, but have not been documented, include the common nighthawk, Calliope hummingbird, gray flycatcher, Western bluebird, and mountain bluebird.

Table 5. Population trends of landbirds associated with seedling/shrub and sapling/pole habitats documented in the project area. (PIF Handbook on Species Assessment & Prioritization)

Landbird Species	Population Trend	Eastside Seedling/Shrub Association	Eastside Sapling/Pole Association
American robin	Stable	X	X
Cassin's finch	Stable		X
Cassin's vireo	Uncertain		X
Chipping sparrow	Significant Decline		X
Dark-eyed junco	Moderate Decline	X	X
Dusky flycatcher	Uncertain	X	
Fox sparrow	Moderate Decline	X	
Green-tailed towhee	Stable	X	
Hermit thrush	Uncertain		X
House wren	Possible Increase	X	X
Nashville warbler	Possible Increase	X	
MacGillivray's warbler	Moderate Decline	X	X
Mourning dove	Moderate Decline		X
Olive-sided flycatcher	Significant Decline		X
Pine siskin	Significant Decline	X	X
Spotted towhee	Significant Increase	X	
Townsend's solitaire	Significant Increase	X	X
Western tanager	Uncertain		X
Western wood-pewee	Uncertain		X
Yellow-rumped warbler	Stable		X

Herptiles

There have been no formal reptile and amphibian inventories done within the proposed treatment units. The Upper Klamath River Canyon was inventoried in 2000 and 2001, though not within the treatment areas, these surveys would provide insight to the herpetofauna that may be present within similar habitats of the treatment areas.

There have also been many incidental documented sightings, in and around the treatment areas, which can be referred to when characterizing herpetofauna. The section of Sheepy Creek near the treatment unit 39S-5E-29 and the section of Bear Valley Creek near the treatment unit 40S-7E-11 were recently surveyed and rough-skinned newts, pacific tree frogs, and common garter snakes were documented.

Based on field reviews, informal and formal species/habitat documentations by qualified personnel, multiple reptile and amphibian species are known to occur or potentially occur within or adjacent to the proposed treatment areas (Table 6). The northern sagebrush lizard, sharptail snake, common and California mountain kingsnake, and western toad have BLM "Bureau tracking Oregon (BTO)" status and Oregon Department of Fish and

Wildlife (ODFW) “sensitive vulnerable” status (Oregon Natural Heritage Program species list - 2001).

Table 6: Herptile species suspected or known to be present in or directly adjacent to the project planning areas. Created 4/29/02 from Wildlife Sightings Database, UKRC Herpetological Inventory-2001, and herptile information from BLM Specialists.

Herptile Species Common Name	Scientific Name	Present or Suspected (P/S)
Northern alligator lizard	<i>Elgaria coerulea</i>	P
Southern alligator lizard	<i>Elgaria multicaudata</i>	S
Northern sagebrush lizard	<i>Sceloporus graciosus</i>	S
Western fence lizard	<i>Sceloporus occidentalis</i>	P
Western skink	<i>Eumeces skiltonianus</i>	P
Rubber boa	<i>Charina bottae</i>	P
Yellow-bellied racer	<i>Coluber constrictor</i>	P
Sharptail snake	<i>Contia tenuis</i>	S
Ringneck snake	<i>Diadophis punctatus</i>	S
Common kingsnake	<i>Lampropeltis getula</i>	S
California mountain kingsnake	<i>Lampropeltis zonata</i>	S
Striped whipsnake	<i>Masticophis taeniatus</i>	S
Gopher snake	<i>Pituophis melanoleucus</i>	P
Western terrestrial garter snake	<i>Thamnophis elegans</i>	S
Common garter snake	<i>Thamnophis sirtalis</i>	P
Western rattlesnake	<i>Crotalis viridis</i>	P
Long-toed salamander	<i>Ambystoma macrodactylum</i>	S
Rough-skinned newt	<i>Taricha granulosa</i>	P
Western toad	<i>Bufo boreas</i>	S
Pacific treefrog	<i>Pseudacris regilla</i>	P

Special Status Species - Wildlife

Bald Eagles (*Haliaeetus leucocephalus*)

Under the Endangered Species Act, the U.S. Fish and Wildlife Service lists the bald eagle as Threatened in Oregon. The analysis area falls within the Klamath Basin Recovery Zone under the Pacific Bald Eagle Recovery Plan. Within the project area, recovery has exceeded goals due partly to the establishment of the Bear Valley National Wildlife Refuge in the late 1970s and nest and habitat protective measures under taken by private, state, and federal land managers.

There are currently two known bald eagle breeding territories, containing 3 known nests on BLM-administered land in the proposed units.

Northern Spotted Owl (*Strix occidentalis caurina*)

There are no known spotted owl nest sites, designated critical habitat, or District Designated Reserve (DDR B Owl Core Areas) found within the proposed units. Of the 4000 acres proposed, approximately 854 acres are considered Nesting, Roosting, and Foraging (NRF) habitat for the spotted owl. Some of the area may also serve as dispersal habitat.

Canada Lynx (*Lynx canadensis*)

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

Other Species of Concern

Northern Goshawk (*Accipiter gentiles*)

The Northern Goshawk is considered a bureau sensitive species by the BLM and is highly associated with mature forests. There are no known sites in the proposed units. The goshawk is generally associated with mature conifer stands and uses similar habitat to that of the northern spotted owl. There was approximately 854 acres of this habitat type within the proposed units.

Survey and Manage Avian Species

Great Gray Owl (*Strix nebulosa*)

The Great Gray owl is considered rare or uncommon in Oregon and is generally associated with forests adjacent to meadow habitat. They generally forage in openings in forest stands or meadow habitat adjacent to the forest edge. It is currently considered a Survey and Manage species (formerly a protection buffer species) under the Northwest Forest Plan. Surveys are required prior to any ground disturbing activities. Surveys for great gray owls have been conducted within the proposed project area. Detections at one location have resulted in this area being considered a single territory, although no nest site has been located. The great gray owl generally uses large broken top trees, as well as large platform nests (red-tailed, goshawk, ravens, etc.) for nesting structure.

White-headed (*Picoides albolarvartus*) and **Black-Backed Woodpecker** (*Picoides arcticus*)

The white-headed woodpecker is generally associated with mature open canopied ponderosa pine stands and to a lesser degree mixed conifer forests. They usually select

snags as nest trees and forage on large ponderosa pine trees. Although they are not common within the proposed area, they have been documented. The black-backed woodpecker is generally associated with lodgepole and ponderosa pine dominated stands that may be mixed with other conifers. Although they are not common, they potentially occur in the proposed area. The pygmy nuthatch is also highly associated with ponderosa pine forests. It utilizes snags for foraging and nesting structure.

Flammulated Owl

The flammulated owl is closely associated with open forests that have a ponderosa pine component, apparently due to the lepidopteran (moths and/or butterflies) prey species that are associated with this type of forest. No surveys have been conducted for this species within the planning area. Systematic surveys have been conducted for the northern spotted owl and great gray owl within the analysis area and no incidental detections of the flammulated owl have occurred.

Environmental Consequences

Cultural Resources

Before ground-disturbing activities are initiated, all fuel treatment areas will have been surveyed for cultural resources. Survey reports will also have been sent to the Oregon State Historic Preservation Office (SHPO) for review and filing. This process has already been performed for much of the area involved in this environmental assessment. All cultural resource sites will be marked in the field and avoided/protected during ground disturbing actions. If project activities result in the discovery of new cultural resource sites, all ground disturbing activity shall cease and the KFRA Lead Archaeologist shall be notified. Resumption of activities in that area will be allowed only after all necessary mitigation fieldwork has been conducted. Impacts to cultural resources will be avoided.

Hydrology/Riparian

Hydrology

Alternative A – Proposed Action

The proposed treatments across 4,000 acres would comprise only a small percentage of the affected watersheds and subwatersheds. Because of the dispersed nature of BLM ownership in the analysis area, cumulative effects would generally not be concentrated within a given subwatershed (Hayden Creek could be an exception).

Streamflow

The proposed actions would have minimal effects on the hydrologic cycle and streamflows. Removing or chipping slash on hillslopes would not be expected to affect infiltration rates or runoff generation. Piling and burning slash could create small areas of hydrophobic (water repellent) soils.

Mowing brushfields would reduce interception by foliage and could lead to increased raindrop impact and reduced infiltration. This could lead to short-term increases in runoff generation.

Removal of small diameter conifers would reduce the number of needles that transpire water. The water that is made available would likely be used by remaining vegetation (Chamberlain et al. 1991), though there could be slight increases in summer soil moisture content (Stone et al. 1999). Slightly increased soil moisture during this time of year would not affect peak flows, but could enhance or prolong baseflows. This is unlikely, since the proposed actions would take place in a small portion of the affected subwatersheds, remaining vegetation will use some of the surplus soil moisture, and evaporation could increase due to increased exposure of bare ground.

Potential for adverse impacts to hydrologic processes arises from the use of mechanical equipment. Compaction resulting from past management activities may still be affecting infiltration and streamflow in portions of the analysis area. The proposed action could impair recovery from past actions or cause additional compaction in limited areas (refer to soil section). This would lead to decreased infiltration and increased overland flow during high intensity storm or snowmelt events

Use of the road network during project implementation, as well as by public or commercial firewood cutters, could lead to rutting or other types of road damage. Some roads that could be used are close to streams, while others are on midslope positions. In some areas these roads detrimentally affect the routing of surface and subsurface water, leading diversion of flow paths and increased peak flows in small streams (Furniss et al. 1991: BLM 1996, page 82). Increased road use could accentuate these ongoing adverse affects.

The proposed actions would reduce the risk of catastrophic fire and consequent adverse short- to medium-term effects on transpiration, interception, infiltration, and runoff generation.

Water Quality

The proposed actions could lead to increased delivery of fine sediment to streams. This could result from soil disturbance associated with mechanical equipment, increased surface erosion resulting from compaction associated with mechanical equipment, increased exposure of bare ground, and/or damage to roads that are hydrologically

connected to watercourses. The likelihood of sediment delivery increases when treatment units or roads are near watercourses.

To reduce the likelihood of sediment delivery, intermittent and perennial streams will be buffered (refer to the Riparian Reserves discussion), and proposed actions in units that are near streams will be designed to address concerns regarding sediment delivery. No treatments are proposed in the Long Prairie watershed, so it is not likely that any proposed actions would cause degradation water quality in this stream.

Proposed understory thins could reduce canopy closure and stream shading. This would allow more sunlight (and thus more solar energy) to reach the water surface. As a result, water temperature could increase. Water temperatures concerns are greatest during the summer months, when many streams in the analysis area do not flow. However, low summer flows make those streams that are perennial susceptible to warming (due to the low thermal mass of the water in the stream). If the proposed thins lead to increased baseflows, summer water temperatures could be slightly reduced. Effects on baseflow would persist indefinitely (or until transpiration rates return to pre-treatment conditions). In the long term, enhanced forest health would lessen the likelihood of stand replacement disturbances and would thus beneficially affect water temperature.

Summer water temperatures in Sheepy Creek could potentially be directly affected by the proposed action. Were they to occur, reductions in stream shading could cause warming rates to increase, and would persist until canopy closure recovers. Units that are near this stream or other perennial stream segments will be designed to address concerns regarding water temperature.

The proposed action would reduce the risk of catastrophic disturbance and consequent adverse short to medium-term effects on sediment delivery and/or stream shading.

Alternative B – No Action

Streamflow

The types of impacts associated with actions proposed action would not occur. Transpiration rates would not be altered. Soil moisture would not increase relative to current conditions and thus there would not be the potential for enhanced or prolonged baseflows.

This alternative would not address the risk of catastrophic fire. Were a large, intense fire to occur, increased peak flows and baseflows would persist through the short- and medium-term (DeBano et al. 1996).

Water Quality

This alternative would not cause soil compaction or disturbance or road damage, and would not create the potential for increased delivery of fine sediments to watercourses.

Potential short- to medium-term adverse effects on stream shading would not occur as a result of management actions.

This alternative would not address the risk of catastrophic disturbance. Were a large, stand-replacement disturbance to occur, stream shading would be reduced over the medium- to long-term and sediment delivery could be increased over the short- to medium-term (DeBano et al. 1996).

Riparian Reserves

Alternative A – Proposed Action

Riparian reserves would be delineated prior to ground-disturbing activities. Treatments could occur within these reserves if the outcome would benefit the ecologic, hydrologic, or geomorphic functionality of the reserve. Most treatments in the riparian reserves would be done by hand thinning and piling. Mechanical treatments would only be used in the outer portions of the riparian reserves in areas with stable soils and flat topography and only if heavy fuel loading requires mechanical treatment. Care would be taken to minimize detrimental effects of these actions.

Of the nine ACS objectives, the proposed action could affect objectives 3, 4, 5, 6, 7, and 8 (which address bank stability, water quality, sediment supply, flow regimes, water table elevation, and riparian vegetation composition and diversity, respectively). Potential impacts to streamflow and water quality are discussed in the Hydrology section of this assessment.

Were the proposed actions to occur within riparian reserves, the vigor and diversity of forested vegetation communities near watercourses would be enhanced. The proportion of pines and Douglas firs would increase, while the proportion of early seral white fir would decrease. This would move forested areas towards the historic range of variability (BLM 1996, pages 17 to 24).

Conducting pre-commercial thins and removing slash could cause short-term reductions in the supply of relatively small pieces of coarse woody debris (CWD) in riparian areas and stream channels. In the medium- to long-term, enhanced forest health would lead to increased availability of larger CWD pieces (as a result of the eventual mortality of large trees). The longevity of CWD would also increase, since pines and Douglas firs are more rot-resistant than white fir, and large material is more stable than small material.

Large CWD plays important roles in shaping stream channels and adjacent vegetation communities. On upland sites, CWD stabilizes soil, acts as a short-term regulator of soil moisture, and is a source of soil nutrients.

Enhanced forest health and reduced risk of catastrophic disturbance would create conditions favorable for long-term maintenance of canopy closure and shade. In the

short- to medium-term, there could be reductions in stream shading along some stream segments.

Riparian vegetation would benefit from enhanced or prolonged baseflow, were that to result from proposed actions.

Alternative B – No Action

This alternative would not address the risk of catastrophic disturbance. Were a large, stand-replacement disturbance to occur, inputs of sediment and CWD would be enhanced over the short- to medium-term (Bragg 2000). The long-term supply of shade and CWD would be reduced. The condition and diversity of forested areas within riparian areas would continue to be on the margins of the historic range of variability.

Fisheries

Alternative A – Proposed Action

The proposed activities may cause soil exposure, soil displacement and reduction in erosion controlling vegetation. These effects could potentially impact aquatic habitat by increasing surface erosion thus impairing water quality and stream channels (Furnis et al 1991). These impacts would occur during the first winter after treatments and would continue until vegetation recovery of exposed surfaces occurs.

This alternative may have beneficial effects to fisheries and aquatic habitat by reducing the likelihood of a catastrophic wildfire. Wildfires in areas with high fuel loads can burn down to bare soil therefore increasing the likelihood and amount of soil erosion. If these areas are adjacent to drainages, then the aforementioned effects may occur.

In order to stay within the objectives of the KFRA RMP, limiting the amount and type of activity in areas adjacent to stream drainages could satisfy the main fisheries habitat objective by maintaining or enhancing the fisheries potential of streams and other waters consistent with BLM's Fish and Wildlife 2000 Initiative and the KFRA ROD RMP to promote the rehabilitation and protection of fish stocks at risk and their habitat. If Best Management Practices are followed according to the KFRA RMP Aquatic Conservation Strategy for Riparian Reserves (Appendix D), then the impacts to fish bearing streams would be minimal (General RR Guidelines-Topsy/ Pokegama/Hamaker EA).

No fish bearing buffers for the affected Bear Valley unit would be recommended at this time. Further review of the lower reaches of Bear Valley Creek would aid in determining the upper limits of fish distribution and the proper application of a fish bearing riparian buffer to the treatment unit.

No federally listed ESA species (suckers or bull trout) are suspected or known to occur near or adjacent to the planning areas. Thus, no effects are anticipated to occur to listed species.

Alternative B – No Action

The lack of treatment to these units could have positive and negative effects to fisheries and aquatic habitats. Hazardous fuels reduction is an important component in the prevention of catastrophic wildfires. However, if fire does not occur, the lack of treatment will benefit fisheries and aquatic habitats by not effecting habitats being used.

Range (Cattle and Wild Horses)

Impacts to cattle and wild horse grazing is essentially non-existent under either of the alternatives. The removal of small tree and brush under Alternative A would open up the vegetation communities allowing for a temporary increase in desirable herbaceous forage species. This opening up would also allow for easier and increased access by cattle and horses to areas they may not be able to use presently. This would be a minor positive impact because forage is not a known habitat limitation for wild horses and most of the grazing use in the analysis area takes place on U.S. Timberlands properties. Conversely, Alternative B would be a neutral (or slightly negative) impact to these grazing animals by not increasing the forage base. There would be no impacts to water development, fencing, and other grazing related habitat attributes from any of the alternatives.

Recreation

Recreation activities in the proposed action area consist mainly of dispersed recreation like sightseeing, mountain biking, skiing, snowboarding and hunting. The proposed action would, in some cases, have short-term negative effects on recreation users. Such effects would include piles of brush and slash left near recreation use areas, and some effects from machinery such as minor ground disturbance and noise and dust caused by the operation. The proposed action would have positive long-term benefits to recreationists by reducing the likelihood of catastrophic stand replacing wildfires. Recreation use areas and opportunities would receive long-term protection from destructive wildfires. While all catastrophic wildfires might not be prevented, vegetative treatments would reduce the risk, which would benefit recreation use.

Positive benefits of the proposed activity would be enhanced winter sports and mountain biking opportunities on Hamaker Mountain, and possibly improved hunting opportunities due to the improvement of game species habitat

Visual Resources

The proposed action would cause short-term negative impacts to visual resources. While mitigation measures and treatments would be designed to avoid long-term negative impacts to scenic quality, some short-term negative impacts would occur. Such visual impacts would include small piles of brush and small trees, small tree and brush stumps cut close to ground, dust and smoke, signs of ground disturbance, and mechanized equipment working in an otherwise primitive, natural appearing landscape.

The proposed action, under the long term, would enhance visual resources. The thinning of overstocked plantations, mowing of brush fields, and other elements of the proposed action, all have the potential to improve the appearance of the landscape by increasing plant species diversity, creating or enhancing forest openings, and improving wildlife habitat.

Sensitive Plants

Special Status Plants

Alternative A

Known special status plant populations and populations located during 2002 surveys will be identified and appropriate protection measures will be implemented, therefore, negative impacts to these species are not expected. Protection measures may include flag and avoid, flagging of buffers around sites, or unit boundary adjustments. No special status plants were located in the proposed units that were surveyed in 1996 and 1998. The use of a mechanical shear or other mechanical equipment would have the potential for impacts to populations undetected by pre-project surveys. However, modification of the structure of hazardous fuel levels may reduce the potential loss of individual plants and/or populations from fires, which may burn hotter and longer than in past fire events under which these species evolved.

Alternative B

This alternative would have little potential to directly affect populations of these species. However, the maintenance and accumulation of heavy fuel loads could result in a wildfire that would be a high intensity fire, to which many of the native species are not adapted. Also, special status plant populations may be directly affected by the physical disturbance associated with fire suppression activities, and through alteration of the nutrient cycling regime of a site from the application of chemical flame retardants.

Noxious Weeds

Noxious Weeds Risk Assessment

Alternative A – Proposed Action

Actions that result in ground disturbance could create conditions that favor the invasion of noxious weeds. The use of the mechanical equipment in Alternative A may create the disturbed conditions under which many noxious weeds have a competitive advantage. Botanical surveys found sites of St. John's wort (*Hypericum perforatum*), tansy ragwort (*Senecio jacobaea*) and Diffuse knapweed (*Centaurea diffusa*). These sites are being monitored and most sites are treated on an annual basis. Treatments consist of biological, chemical, and manual means. 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.

Alternative B – No Action

Alternative B would not create the physically disturbed conditions under which many noxious weeds have a competitive advantage. However, due to the potential for wildfire from the persistence of high fuel loads, weed populations may have a competitive advantage under conditions resulting from the soil disturbance associated with fire suppression activities, and from alteration of the nutrient cycling regime of a site as a result of the application of chemical flame retardants. The vehicles and machinery entering the project area to suppress any wildfires would increase the potential for the introduction of noxious weeds from sources outside the project area.

Soils

Alternative A - Proposed Action)

The portion of this alternative that includes mechanical shearing, slashbusting, grinding, or mowing has an associated risk of soil compaction, soil erosion, and loss of site productivity. Soil compaction occurs when soil macropores are removed or reduced resulting in an increase in soil bulk density. These macropores are critical to soil health as they are where soil organisms reside, fine roots of plants reside, and the means by which water infiltration into soil occurs. Soil compaction and the associated compromise of macropores is a risk associated with ground-based machinery.

Any treatments that include the use of ground-based machinery run the risk of compaction when the soils are moist, and puddling when soils are wet. These risks are present for almost every soil series in the project area. Use of machinery should be restricted during times of high soil moisture (>20% by weight). This will reduce the

chances of detrimental compaction, puddling, or increased runoff, see Klamath Falls Resource Area (KFRA) RMP/FEIS, Appendix F, pp. 23-24. A map showing the sensitive soil areas will be consulted during the layout of the actual treatment units. Some of the treatments units will be modified to remove sensitive soil areas from the treatment area.

Soil monitoring on Klamath Falls Resource Area (KFRA) to date has been conducted in timber harvest operations in upland communities. The results of this monitoring (KFRA Soil Monitoring, 1997 and KFRA Soil Monitoring, 1999) have concluded that detrimental soil compaction, may occur with as few as three passes of a mechanical harvester over the same ground. (KFRA Resource Management Plan - Bureau of Land Management, September 1994 and Standards and Guidelines for Detrimental Soils, Pacific Northwest Region - Meurisse, 1997)

Use of slashbuster machinery has the same risk of soil disturbance or compaction as ground based mechanical harvesters. In 2001 KFRA initiated soil compaction monitoring of a slashbuster project on Hamaker Mountain FTZ (Fuel Treatment Zone 243). The pre treatment soil sampling was completed in 2001. Effects of the treatment will not be known until after post treatment samples are taken and analyzed which will occur after the project is completed sometime within the next few years. There is an additional risk to soils in areas that receive the cumulative effects of both mechanical harvester and slashbuster treatments, increasing the potential for detrimental compaction. While the soils may recover from disturbance and any detrimental compaction that may occur from one activity, repeated activities using machinery will obviously increase recovery time

In most cases hand treatments, hand felling, piling, and burning of trees and brush, pose little to no risk to soil resources. In a few cases where significant removal of vegetation occurs in steep areas an increase in soil erosion hazard could occur, even without the additional impacts of using machinery. Wintertime burning of piles is preferred to reduce the risk of high temperatures on soils.

Alternative B - No Action

This alternative does not pose any immediate risk to soils, however this action may pose a long-term risk if a catastrophic wildfire were to occur. Severe and rapid reduction in vegetation due to wildfire could reduce soil stability. This would result in an increased soil erosion hazard and a decrease in site productivity for forage, habitat, and timber production in the short term.

Survey and Manage Species

Alternative A – Proposed Action

Survey and Manage fungi and mollusks use Coarse Woody Debris (CWD) for habitat.

More CWD would be made available through the proposed project. In the long term, fungi and mollusks would also benefit from increased canopy closure. Fungi would benefit from an increased diversity of tree species that are important mycorrhizal hosts.

For Survey and Manage species pre-disturbance surveys will be done according to current Survey Protocol in the project area, surveys will be completed fall of 2002. Survey and Manage sites found in the project area will become Managed Known Sites. Known sites will be managed according to current Management Recommendations from the 2001 ROD and the Klamath Falls Management Zone Team.

Alternative B – No Action

Under this alternative Survey and Manage species and the small CWD that fungi and mollusks use for habitat would probably be undisturbed in the short term. In the long term a stand replacing fire could be detrimental to available CWD, canopy closure and the duff layer that provides habitat to Survey and Manage species.

Vascular Plants

Alternatives A – Proposed Action

Any S&M vascular plant populations located during 2002 surveys will be identified and appropriate protection measures will be implemented, therefore, negative impacts to these species are not expected. Protection measures may include flag and avoid, flagging of buffers around sites, or unit boundary adjustments.

Alternative B – No Action

This alternative would not directly affect populations of S&M vascular plant species. However, without treatment, the maintenance and accumulation of heavy fuel loads could result in a wildfire, which would be a high intensity fire, to which many of the native species are not adapted.

Wildlife

Ungulates

Under Alternative A disturbance from the project may have a short-term direct effect on individual elk and deer. The removal of shrubs would result in a short-term loss of forage and hiding cover for big game. These species are especially reliant on the shrub species during the winter months when foraging opportunities become limited. Leaving shrubs, both quantity and diversity of species, for hiding cover and foraging is essential to limit impacts to elk and black-tailed deer. The removal of decadent shrubs would create areas for rejuvenation of vegetation encouraging growth of young plants that may create

new foraging opportunities. It would also reduce fuels hazards and reduce the risk of a wildfire to occur.

The removal of small trees may also reduce hiding cover, especially in areas near roadways where increased pressure from hunting may occur. Leaving a strip of small trees and brush along all roads would assist in minimizing pressures from traffic and road-side hunters. In plantations, brushing would encourage growth of trees and move the stand towards potential habitat.

Firewood cutting may also create disturbance to individuals although this disturbance should be a short-term impact to any given area.

Under Alternate B there would be no direct detrimental impacts, although in areas that have heavy fuel loads the risk of a wildfire to occur may still remain high. A catastrophic wildfire would have negative impact on the elk and deer populations due to the loss of thermal and escape cover.

Furbearers

Under Alternative A, impacts to bobcat, mountain lion, and black bear should be low. The biggest impacts would come from disturbance associated with brushing, mowing and shearing of small trees. The potential for firewood cutting would also pose the possibility for disturbance. These impacts would occur for a short duration and impacts associated with this disturbance would be minimal.

Under Alternate B there would be no direct detrimental impacts, although in areas that have heavy fuel loads the risk of a wildfire to occur may still remain high. A catastrophic wildfire would have negative impact on bobcat, mountain lion and black bear due to the loss of foraging and resting habitat, also due to the loss of connectivity of the habitat.

Bats

Under Alternative A, impacts to local populations should be low. Daytime activities associated with the proposed project may disturb some roost sites, but these impacts should be considered a short-term disturbance that would end when the proposed project is completed. Snags and other potential roost areas should not be disturbed.

Under Alternate B, there would be no direct detrimental impacts, although in areas that have heavy fuel loads the risk of a wildfire to occur may still remain high. These high fuel loads increase the risk for a wildland fire to occur. A catastrophic wild fire would have negative impact on the local bat population due to the loss of roosting habitat.

Upland Birds

Under Alternative A, slashbusting, shearing, grinding, or mowing of shrubs would have greatest impacts on current habitat characteristics. The loss of shrubs would reduce cover and foraging opportunities and could have an adverse affect on local populations. Maintaining some islands of shrubs to serve as cover would reduce impacts to grouse, turkeys, and quail. Nest sites and nesting habitat may also be lost during the proposed activities. These birds are all ground nesters and proposed operations in the springtime may cause loss of nests and individuals.

Under Alternate B, there would be no direct detrimental impacts, although in areas that have heavy fuel loads the risk of a wildfire to occur may still remain high. These high fuel loads increase the risk for a wildland fire to occur. A catastrophic wildfire would have a negative impacts on the bird population due to the loss of foraging habitat and nesting cover.

Raptors

Under Alternative A, direct impacts would occur from disturbance from machinery. Disturbance to raptors during the nesting and fledgling periods would have the greatest impacts to individual nest sites. If a nest site were located during activities, either buffering this area or temporarily halting operations adjacent to this site would reduce these impacts.

Impacts to owl species would be similar to the other raptor species although the alteration of habitat may have impacts to the prey base. They rely heavily on the small rodent population. Leaving a diversity of species and islands of shrubs to act as cover and habitat structure should reduce the overall impacts to the prey base.

Under Alternative B, there would be no direct detrimental impacts, although in areas that have heavy fuel loads the risk of a wildfire to occur may still remain high. A catastrophic wildfire would have negative impact to the raptor population due to the loss of roosting trees and the destruction of nesting habitat.

Woodpeckers

Under Alternative A, impacts to local populations should be low. Daytime activities associated with the proposed project may disturb some nesting and foraging sites, but these impacts should be considered a short-term disturbance.

Under Alternate B, there would be no direct detrimental impacts, although in areas that have heavy fuel loads the risk of a wildfire to occur may still remain high. These high fuel loads increase the risk for a wildland fire to occur.

Landbirds

The proposed action would result in the loss of breeding habitat for those passerine bird species that utilize shrub habitats, and conifer trees in the < 7" size class. The seedling/shrub coniferous forest habitat is not considered limiting in the Interior Columbia River Basin (Saab and Rich 1997); however, the proposed action would result in more rapid conversion to forest than would occur naturally if the succession of the shrub community were allowed to take its natural course. The species most likely to be affected are those associated with the shrub habitat. Eleven of the 20 species documented within the project area are associated with shrub habitats (Table 5). Of these, four have declining population trends according to The Partner's in Flight Handbook on Species Assessment and Prioritization (Panjabi 2001). Species associated with sapling/pole forest are less likely to be affected because the trees which would be removed are primarily suppressed small diameter trees with a limited amount of foliage and suitability for nesting. Slashbusting and piling of the small diameter trees could result in conditions that would favor the growth of forbs, grasses and shrubs. This increase in diversity of the understory would be favorable to bird species that are dependent upon shrub habitats associated with forest. Six of the 15 bird species associated with the sapling/pole habitat, and which occur in the project area, have declining population trends (Panjabi 2001). However this habitat is not limiting in the KFRA resource area. Over the long term, effects of the proposed action on the suitability of the sapling/pole forest for nesting are not expected to be significant.

If the proposed action takes place during the breeding season for these birds (May through July), there would be direct losses of reproduction for those species associated with these habitat types. Direct impacts to landbirds could be minimized if the project is implemented between mid-August and mid-April. Under the No Action Alternative, species associated with shrubs would not be negatively affected. Sapling/pole stages of forest habitats have not been identified as limiting habitats for landbird species. However, old growth and mature coniferous forests and the landbirds associated with them are of concern due to past habitat loss and current threats. Fire suppression and overstocking threaten the long-term attainment of forest succession to the mature stages.

The No Action alternative could threaten the attainment of mature forests over the long term.

Herptiles

Alternative A – Proposed Action

The proposed action may have direct and indirect negative impacts to native herptiles. By utilizing mechanical methods, impacts may include direct loss of individuals by machinery and habitat degradation via reduction of understory used by most herptiles for hiding and hunting cover (Brown, et al 1995). A recent inventory has shown that a high number of herptile individuals and species inhabit the Upper Klamath River Canyon

(UKRC) and may use habitats adjacent to the canyon for some parts of their life cycle (Roninger 2001). This alternative may have indirect beneficial effects to herpetofauna by reducing the likelihood of a catastrophic wildfire. In the long term, these treatments may provide increased habitat diversity, therefore improving microsite characteristics and enhancing prey base for herptiles. In order to stay within the objectives of the KFRA RMP, leaving 10% untreated or the “mosaic” approach could satisfy the main wildlife habitat objective by enhancing and maintaining biological diversity and ecosystem health in order to contribute to healthy wildlife populations.

Alternative B - No Action

The lack of treatment to these units would be expected to have both positive and negative effects to herptiles. Short-term benefits from the no action alternative would occur by protecting the existing herptiles/habitat by leaving the existing habitats, currently occupied, unaffected.

However long-term impacts due to lack of treatment would be expected to occur which would potentially reduce the resilience and stability of the herptile habitats (Brown, et al 1995). Fuels reduction is an important component in the prevention of catastrophic wildfires. Without fuels treatments the risk of catastrophic fire is increased, thus exposing herptile habitat to long-term increased fire hazards. A catastrophic fire would have major negative impacts to herptile populations through loss of life and destruction of habitat.

Special Status Species

Bald Eagles

There are currently 2 known nest territories containing a total of 3 nests within the proposed project area. Under Alternative A, impacts to local individuals should be low. The greatest potential impacts would come from disturbance associated with brushing, mowing and shearing of small trees. The potential for firewood cutting would also pose the possibility for disturbance. Seasonal restriction and distance buffers (see PDF's) would reduce the risk from disturbance.

Under Alternative B, there would be no direct effects on the bald eagle, although in areas that have heavy fuel loads the risk of impacts associated with wildfire occurrence may still remain high. These impacts could include loss of nest trees and loss of prey-producing habitat.

Northern Spotted Owls

No known sites exist within the proposed area. Under the Proposed Alternative, areas considered NRF habitat have the potential to be degraded. Structure from shrubs, small trees, and down woody debris are important components that are part of NRF habitat.

Removing small trees, brush, and down woody debris may reduce habitat suitability. Leaving a diversity of small tree and shrub species, islands of shrubs, and down woody debris (see PDF's) to act as cover and habitat structure should reduce the overall impacts to the prey base and habitat structure.

Under Alternative B, there would be no direct effects on Northern spotted owls. In areas that have heavy fuel loads the risk of impacts associated with wildfire occurrence may still remain high. Were a catastrophic wildfire to occur, there would be negative impacts on the Northern spotted owl due to loss of nest trees and loss of prey-producing habitat.

Other Species of Concern

Goshawks

No known nest sites are known within proposed units. Impacts to potential northern goshawk habitat from both alternatives would be similar to that of the northern spotted owl.

Survey and Manage Avian Species

Great Gray Owl, Flammulated Owl, White-headed Woodpecker, Black-Backed Woodpecker. Only the Great Grey Owl species requires surveys.

Under Alternative A impacts to local populations should be low. Daytime activities associated with the proposed project may disturb some nesting and foraging sites, but these impacts should be considered a short-term disturbance. Snags and other potential foraging and nesting areas should not be disturbed. In areas of dense shrubs, mowing and brushing would potentially increase foraging opportunities by providing openings in which to hunt. Leaving pockets and islands of shrubs would assist in maintaining the prey base. Applying seasonal restrictions (see PDF's) in known great gray owl territories would minimize impacts from disturbance.

Under Alternative B, there would be no direct detrimental impacts, although in areas that have heavy fuel loads the risk of a wildfire and associated impacts may still remain high. A catastrophic wildfire would have negative impact on the population due to the loss of nest trees and loss of prey-producing habitat.

Cumulative Effects

Cumulative effects are the collective impacts that accrue over time on the landscape, including actions on adjacent lands and in other ownerships, and actions that have taken place in the past or can be predicted for the future. It is important to analyze the cumulative effects to ensure that the proposed action is seen in the larger context of incremental changes over time.

Cultural Resources

Cultural resources found through investigation of the project area have been identified and flagged for avoidance. Therefore, impacts to cultural resources from either alternative will not have any substantial cumulative impacts.

Hydrology/Riparian

Under the proposed action Alternative A, there is potential for cumulative impacts to the hydrological processes and riparian reserves from two sources: (1) soil disturbance resulting from past BLM management activities may still be affecting sediment delivery, infiltration and streamflow in portions of the analysis area; and (2) adjacent landowners in the analysis area have logged their lands in the past and are expected to continue harvesting in the future. The proposed action could impair recovery from past actions or cause additional effects in limited areas. This could lead to decreased infiltration, increased overland flow, and movement of sediments during high intensity storm or snowmelt events.

Areas that receive the cumulative effects of both mechanical harvester (in the past) and slashbuster treatments (this proposal) have more potential for detrimental compaction and soil disturbance. While the soils may recover from disturbance and any detrimental compaction that may occur from one activity, repeated activities using machinery will obviously increase recovery time. However, riparian areas typically have a much shorter recovery time than dry upland areas, and negative impacts would be minimized by following the selected project design features and mitigating measures.

The proposed action could lead to increased delivery of fine sediment to streams from soil disturbance associated with mechanical equipment, increased surface erosion resulting from compaction associated with mechanical equipment, increased exposure of bare ground, and/or damage to roads that are hydrologically connected to watercourses. There would be a short-term decrease in small pieces of coarse woody debris, with a later increase in larger sizes of woody debris. Proposed understory thins could reduce canopy closure and stream shading. As a result, water temperature could increase in the short term, although the vegetation will show significant regrowth in 5-10 years.

In the logging operations that are occurring on private lands, the larger trees are usually removed while the small trees, brush, and slash are left behind, which is exactly opposite of this proposal. However, the use of slashbuster machinery has the same effect on soil disturbance, shading, and compaction as ground based mechanical harvesters. Thus, if both private and public lands are examined, a larger portion of the watershed has ground-disturbing activities from one activity or the other. It is expected that the use of best management practices and mitigation measures will ensure that the cumulative effects do not cause significant or long-term impacts to the hydrology or riparian reserves in the project area.

There should also be cumulative beneficial impacts from this activity. If the proposed thinnings lead to increased water flows as anticipated, summer water temperatures could be slightly reduced. Effects on baseflow would persist indefinitely (or until transpiration rates return to pre-treatment conditions). The litter that is left on the ground by the slashbuster may retard erosion and enrich the soil in the long term. Also, enhanced forest health would lessen the likelihood of stand replacement disturbances and would thus beneficially affect soil stability, nutrients, and water temperature.

Under the no-action Alternative B, there would be no further soils or hydrological impacts from compaction or disturbance by heavy equipment, and no reduction in shade or water quality. However, the probability of a stand-replacing wildfire or other disturbance would increase every year. If such an event happened, the effects on water flows, shading, soil nutrients, temperatures, and erosion would be devastating.

Fisheries

The cumulative effects on fisheries would be a result of the changes in hydrology and riparian areas, as discussed above. The proposed activities may cause soil exposure, soil displacement and reduction in riparian vegetation, adding to the existing impacts from mechanical equipment that was used in and surrounding the project area. These effects could potentially impact aquatic habitat by increasing surface erosion, thus impairing water quality and stream channels. These impacts would be minimized through the use of best management practices and mitigation measures.

The beneficial effects that are expected for the hydrology and riparian areas (discussed above) would also benefit the fisheries. Reducing the danger of stand-replacing wildfires is an important benefit for all resources in the project area.

Range/Wild Horses

Impacts to cattle and wild horse grazing are essentially non-existent under either of the alternatives. Cumulative effects are not expected to occur.

Recreation

Cumulative effects on recreation would result from piles of brush and slash, minor ground disturbance, and noise and dust caused by the operation, adding more impact to similar activities on private lands in the adjacent area. The proposed action would also have an important benefit for recreation, by reducing the likelihood of catastrophic stand replacing wildfires.

Visual Resources

The proposed action would probably cause minor cumulative impacts to visual resources for the first five years or more. Although close examination will show much difference between public and private lands, the overall impression for both ownerships in the short

term will be of thinned, young timber stands, small piles of slash, small cut stumps, dust and smoke, tracks left by the operations, and mechanized equipment in the area. However, there will be a healthy residual stand of medium-sized trees left in this project area, which will quickly respond to more water, sunlight and nutrients available.

The proposed action, in the long term, would enhance visual resources. The thinning of overstocked plantations, mowing of brush fields, and other elements of the proposed action, all have the potential to improve the appearance of the landscape by increasing plant species diversity, developing faster growth on residual trees, creating or enhancing forest openings, and improving wildlife habitat. After 5-10 years, noticeable growth on the residual trees and resprouting of brush and grass will make the project area begin to look more like a natural stand.

Sensitive Plants

In Alternative A, special status plant populations will be identified and flagged for avoidance. Although there could be some disturbance to undetected individual plants, this would not have much effect to any population that occupies the area. Because of logging on private lands, there could be a cumulative effect to sensitive plants in the analysis area. However, it is not expected to significantly affect this resource.

Under Alternative B, increased possibility of wildfire would pose more threat to the sustainability of sensitive plant species, and would affect both private and public lands. Therefore, negative effects are expected to be more significant under Alternative B.

Noxious Weeds

Noxious weeds are present on both public and private lands in the project area. The proposed action will result in ground disturbance that could cause cumulative effects in the invasion of noxious weeds, and will increase the risk of transporting weeds into the area. However, Alternative A uses best management practices and mitigation measures to minimize the possibility of spreading noxious weeds.

Under the no-action Alternative B, the possibility of a stand-replacing wildfire would increase. If a wildfire did occur, the results of fire suppression and nutrient changes would also give the weeds a competitive advantage.

Soils

Alternative A includes mechanical shearing, slashbusting, grinding, and mowing, which has an associated risk of soil compaction, soil erosion, and loss of site productivity. Areas that have recently been mechanically harvested have more potential for cumulative impacts. While the soils may recover from disturbance and any detrimental compaction that may occur from one activity, repeated activities using machinery will obviously increase recovery time. In this alternative, the use of machinery will be restricted during

times of high soil moisture, which will reduce the chances of detrimental compaction, puddling, or increased runoff.

The logging activities on the surrounding private lands also add to the cumulative effect, by causing similar disturbance to more acres in the watersheds. Undisturbed ground and vegetation have a stabilizing effect on soils, so more acres of ground disturbance would increase the possibility of soil loss. These effects will be mitigated through best management practices.

There will also be beneficial cumulative effects from this alternative. Former treatments left drying fuels that will be turned into litter and left on the ground by the slashbuster, which should retard erosion and enrich the soil in the long term. Reduced competition in the stands would result in enhanced forest health to lessen the likelihood of stand replacement disturbances and would thus beneficially affect soil stability, nutrients, and permeability.

Alternative B would not cause cumulative soil disturbance, but would lead to increased risk of a stand-replacing wildfire, which would add to similar circumstances on private lands. Deforestation due to wildfire could reduce soil stability, increase soil erosion hazard, and decrease site productivity in the short term (at least 5-10 years).

Survey and Manage Species

Survey and Manage species would be flagged and avoided under Alternative A. Although there could be some disturbance to any undetected individuals, this would not have much effect to any population that may occupy the area. Because of logging on private lands, there could be a cumulative effect to Survey and Manage species in the analysis area, but activities are not expected to have significant negative impacts. Under this alternative, Survey and Manage species would probably be helped in the short term by having more small coarse woody debris available for habitat.

Under Alternative B, increased possibility of wildfire would pose more of a threat to the sustainability of Survey and Manage species, and would affect both private and public lands. A stand-replacing fire could be detrimental to available coarse woody debris, canopy closure and the duff layer that provides habitat to Survey and Manage species. Therefore, cumulative effects are expected to be more significant under Alternative B.

Wildlife

Under the proposed Alternative A, there would be cumulative impacts both from adjacent activities on private land, and from the residual effects of former mechanical harvesting on public lands. Direct disturbance to individual wildlife species caused from activities related to the project are considered short-term impacts and would end when the project was completed. The indirect impacts from the vegetation changes are also considered short-term impacts and would be reduced annually, starting the next growing season as

grasses and shrubs are rejuvenated. Over the next five to ten years the treatment areas should be showing increased vigor in the residual stands.

The detrimental impacts would be low to the wildlife species affected by this project. Project design features and mitigating measures described in this document would reduce negative impacts to wildlife species. The most significant habitat changes would be in the temporary loss of shrubs, which would reduce cover and foraging opportunities and could have an adverse affect for the short term (5-7 years) on local wildlife populations that are dependent on shrub habitat. The proposed action would result in the loss of breeding habitat for those passerine bird species that utilize shrub habitats and conifer trees in the < 7" size class. This habitat is not considered limiting in the Interior Columbia River Basin, but individuals could be displaced from the project area.

The beneficial impacts from the proposed alternative would include the reduction of fuels over a large area, reducing the risk of a catastrophic wildfire. This would minimize the likelihood of a stand replacing fire and the resulting loss of wildlife habitat. The removal of decadent shrubs would also stimulate new growth of shrubs and grasses, increasing forage for ungulates and small mammals.

The no-action Alternative B would not have the short-term detrimental effects from disturbance and vegetation changes; however it would leave the area prone to catastrophic wildfires and gradually increase the susceptibility of a stand replacing fire to occur.

Project Design Features and Mitigating Measures

- Cultural sites requiring protection will be buffered according to guidance provided by the resource area's archeologist, and the area within these buffers will not be treated.
- Using the guidelines described in the KFRA RMP, delineate riparian reserves prior to ground-disturbing activities.
- Hand treatments will be used in riparian reserves where desired results can be achieved. Limit the use of mechanical equipment to the outer portion of the riparian reserves and only to areas where detrimental impacts to soils and vegetation can be minimized.
- Limit the locations and use of stream crossings by mechanical equipment.
- Retain coarse woody debris (>6 inches in diameter and >20 feet in length) within riparian reserves and the stream channels.

- The use of slashbuster, grinding, mechanical shearing, and mowing equipment will be restricted to dry conditions (<20% soil moisture by weight) or when the ground is frozen to a depth of 6 inches to minimize soil compaction, puddling, and soil disturbance, per the Klamath Falls Resource Area (KFRA) RMP/FEIS, Appendix F, pp. 23-24.
- Best Management Practices guidelines identified in the KFRA RMP/FEIS, Appendix F, on the use of mechanical slashbuster, grinding, mechanical shearing, and mowing equipment will be followed.
- A map showing the sensitive soil areas will be consulted during the layout of the actual treatment units. Some of the treatment units will be modified to remove or avoid sensitive soil areas from the treatment area.
- In northern spotted owl Nesting, Roosting, Foraging (NRF) habitat maintain the understory by retaining a diversity of conifer trees < 6 inches.
- Maintain the down woody debris component consistent with the KFRA RMP and NFP.
- Maintain snag component consistent with the KFRA RMP and NFP.
- Leave islands of brush 10-30% in NRF habitat, along with a diversity of shrub species.
- Outside of NRF habitat, maintain 10% brush islands, along with a diversity of shrub species.
- Near bald eagle nest sites, no activities within ¼ mile or ½ mile line-of site will occur during the nesting season (Jan 1 – Aug 31). The wildlife biologist may adjust these dates if the young have fledged prior to the Aug.15th (usually the fledging date plus 2 weeks).
- In great gray owl activity areas, observe seasonal restrictions from March 1 – July 15th.
- Areas along major roads within the VRM class II-III areas (includes Highway 66, Topsy Rd, Hamaker Mt. Road and Klamath River access roads), (see map 5, visual resource management classes, Klamath Falls ROD/RMP), should have small piles of slash, dispersed for firewood, pole or post gathering or burning.
- No large landings/slash decks, obvious skid trails and minimal ground disturbance near major roads, where possible, would also maintain scenic quality with the areas mentioned above.

- Along 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.
- On the upper north facing slopes of Hamaker Mountain, design treatments where possible, to create long semi-continuous openings and glades that are conducive to winter sports while maintaining a natural appearance. Design mechanical treatment areas to blend in with natural and man-made openings and clearings, using standard BLM visual design techniques. These measures could include designing treatment units to avoid leaving sharp lines with strong visual contrast, leaving larger trees in random patterns and clumps to mimic a natural appearance, and visually screening treatment activities where possible, next to major roads.
- For Survey and Manage species pre-disturbance surveys will be done according to current Survey Protocol in the project area.
- Survey and Manage sites found in the project area will become Managed Known Sites.
- Known sites will be managed according to current Management Recommendations from the 2001 ROD and the Klamath Falls Management Zone Team.
- All vehicles and equipment will be cleaned off prior to operating on BLM lands. Removal of all dirt, grease, and plant parts that may carry noxious weed seeds or vegetative parts is required and may be accomplished with a pressure hose.
- Noxious weeds in the immediate area of operations shall be mowed to ground level prior to the start of project activities.
- All equipment and vehicles operating of main roads shall be cleaned off prior to leaving the job site when the job site includes noxious weed populations. Removal of all dirt, grease, and plant parts that may carry noxious weed seeds or vegetative parts is required and may be accomplished with a pressure hose.
- 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.

Other Consequences

No direct or indirect disproportional high or adverse human health or environmental effects to minority or low-income populations are expected to result from implementation of the proposed action.

Consultations

Consultation as required under the Endangered Species Act was conducted with the USFWS on Threatened and Endangered species that may occur within the proposed project area. A “May Effect, Not Likely To Adversely Effect” determination was made for the northern spotted owl and bald eagle. A “No Effect” determination was made for all other T&E species. If new information became available that would change any of these determinations, consultation with USFWS would be reinitiated on those site-specific units or areas. Consultation documents are on file at the BLM and USFWS offices.

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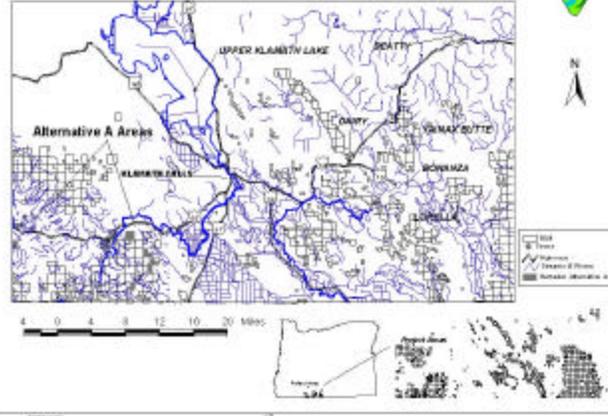
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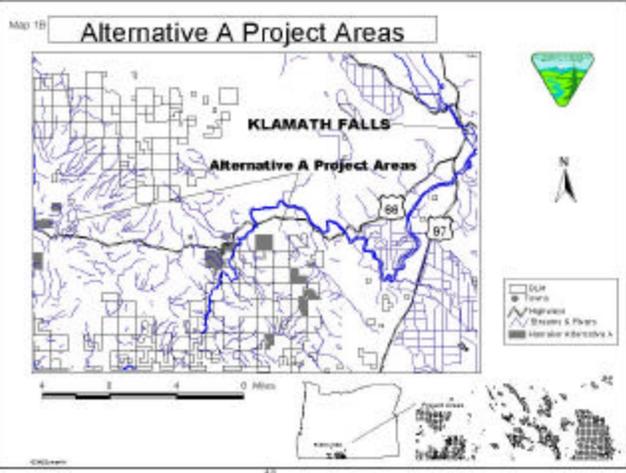
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Alternative A Overview





- GUP
- Towns
- Highways
- Streams & Ponds
- Alternative A

0 1 2 3 4 Miles



Alternative A

