USDA

United States
Department of
Agriculture

Forest
Service

March 2005

Final Environmental Assessment

ASPEN PLANNING AREA

VEGETATION MANAGEMENT

ALTERNATIVES
ALTERNATIVE 1 – NO ACTION
ALTERNATIVE 2 – PROPOSED ACTION
ALTERNATIVE 3

ALTERNATIVE 3 is the PREFERRED ALTERNATIVE

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ENVIRONMENTAL ASSESSMENT
ASPEN PLANNING AREA
VEGETATION MANAGEMENT

SUMMARY

The Bend-Fort Rock Ranger District of the Deschutes National Forest, Oregon, proposes to improve and protect deer winter range by reducing the risk of insect outbreaks, the spread of disease pathogens, and uncharacteristic, high intensity wildfire that could further jeopardize critical deer habitat. The action is needed because: critical deer habitat in winter range is lacking desirable vegetative shrub and tree composition and structure, and is substantially fragmented by roads. Proposed treatments in Deer Habitat have been analyzed within the Aspen Planning Area**.**

Alternative 2 (Proposed Action) would:

- Reduce the risk of deer habitat loss from insects, disease, and high intensity, stand replacement wildfire.
- Enhance tree growth and structural diversity.
- Improve composition and structural diversity of deer forage.
- Improve aspen and mountain mahogany stands.
- Reduce road density to reduce deer habitat fragmentation.
- Reduce potential off highway vehicle disturbance to deer.

In addition to the proposed action, the Forest Service also evaluated the following alternatives:

- Alternative 1 (No Action): No vegetation management or road closure/decommissioning activities to enhance deer habitat would occur. Management activities would continue as are presently occurring and/or allowed.
- Alternative 3: This action alternative is similar to Alternative 2 (Proposed Action). This alternative proposes approximately 100 more acres of vegetation management activities with substantial differences (**Table 6, page 18)**.

Alternative 2 (Proposed Action) and Alternative 3 focus on: 1) the need to provide a well distributed ratio of early, mid, and late developmental (seral) stages of deer forage; 2) the reduction of tree density to reduce the risk of stand replacement events from natural disturbances; 3) the reduction of habitat fragmentation; and 4) enhancing and stabilizing aspen and mountain mahogany habitats. It would be expected that short-term (less than 5 years) vegetation changes would provide long-term benefits and habitat stability. There would be no commercial thinning with either Alternative 2 (Proposed Action) or Alternative 3.

Based upon the effects of the alternatives and public input, the responsible official (District Ranger) will decide whether or not to initiate non-commercial thinning, prescribed burning, mechanical shrub treatment, aspen release, mountain mahogany enhancement, conifer removal, and road closures and decomissioning. All activities would occur within Deer Habitat and would be designed to meet Deer Habitat objectives.

All measurements in this document are approximate.

FIGURE 1

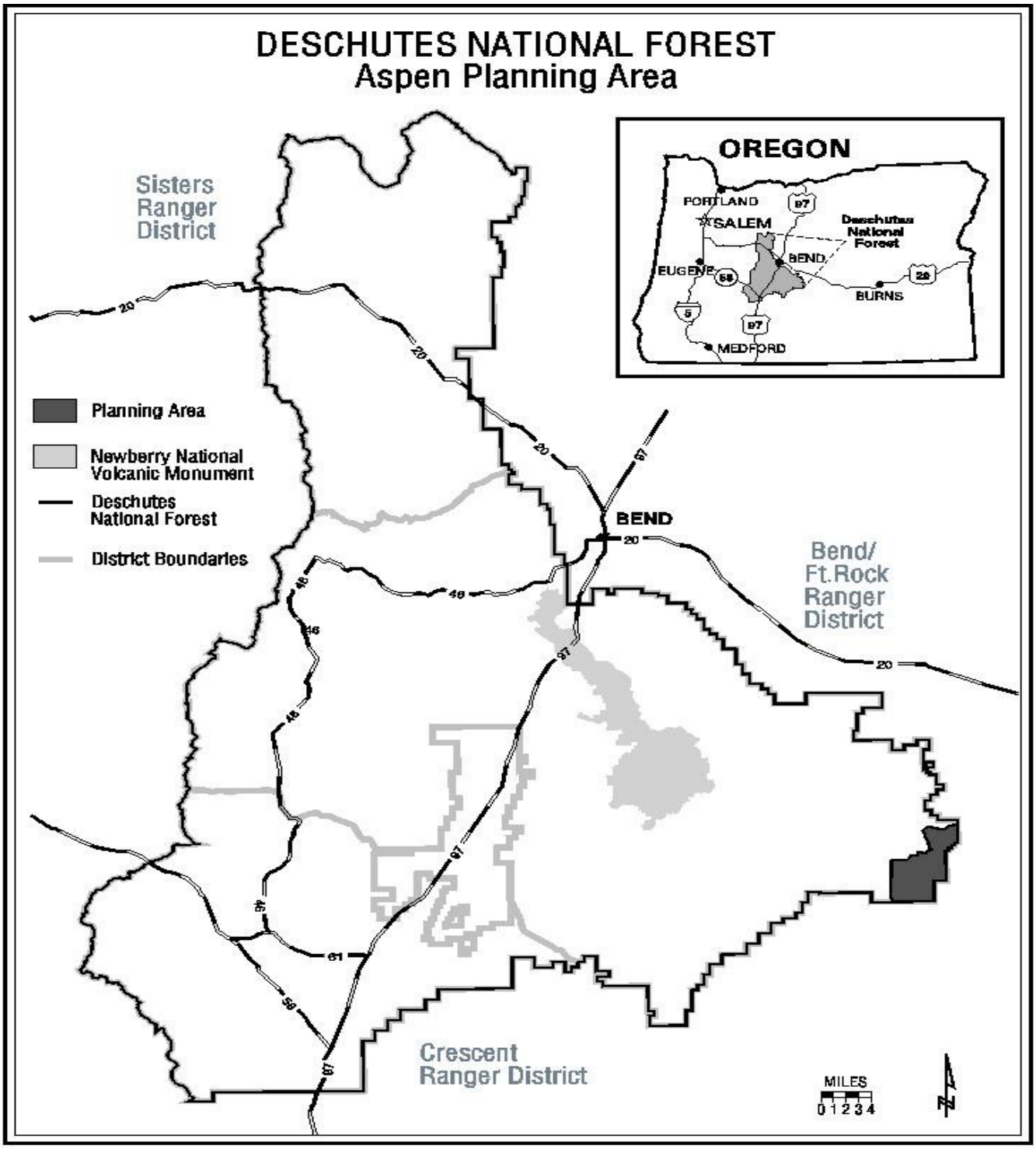
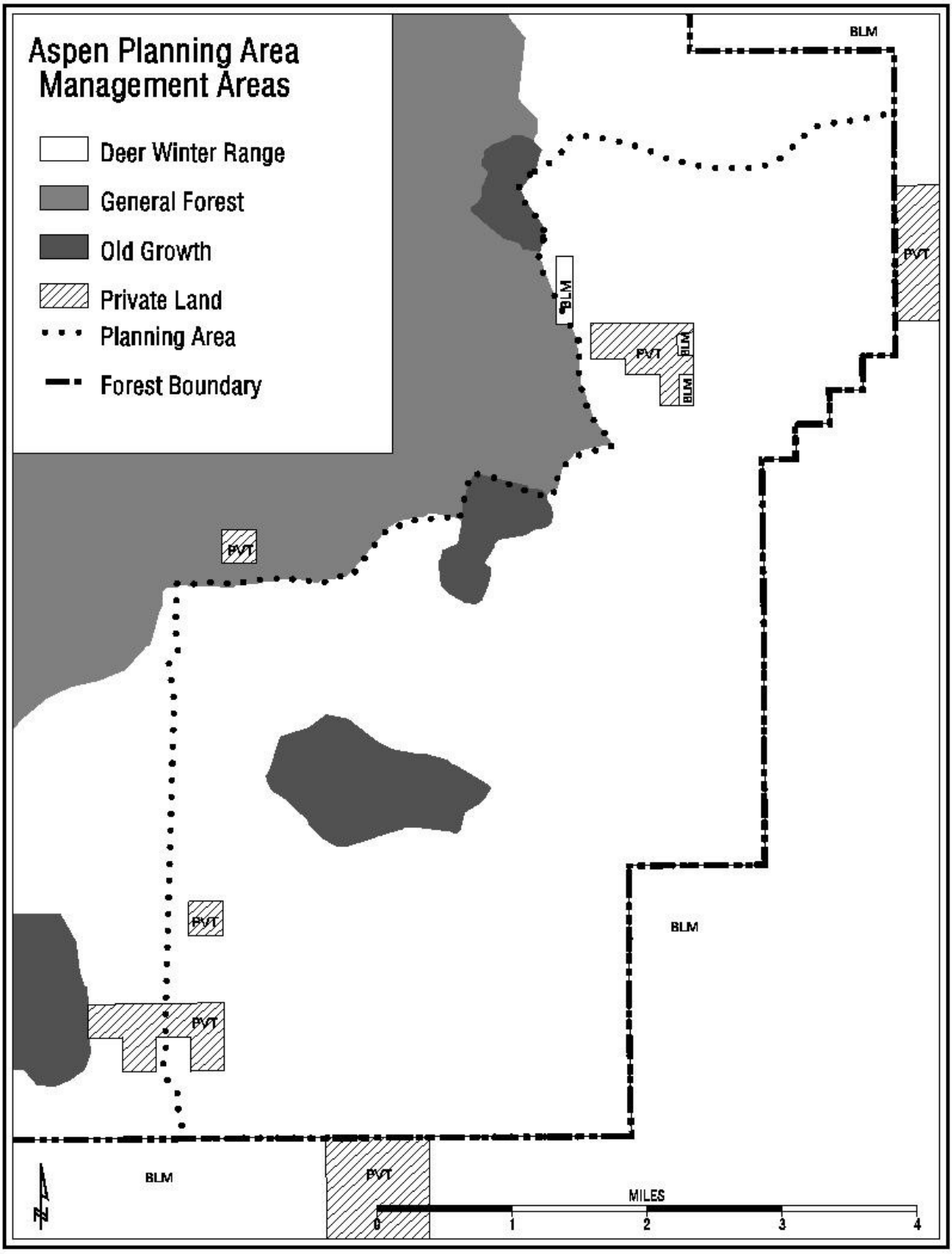

DESCHUTES NATIONAL FOREST
Aspen Planning Area
OREGON
PORTLAND
SALEM
EUGENE
BEND
BURNS
MEDFORD
Deschutes National Forest
Sisters Ranger District
Bend/ Ft.Rock Ranger District
Crescent Ranger District
Planning Area
Newberry National Volcanic Monument
Deschutes National Forest
District Boundaries
BEND
MILES
0 1 2 3 4
N

FIGURE 2


Aspen Planning Area
Management Areas
Deer Winter Range
General Forest
Old Growth
Private Land
Planning Area
Forest Boundary
BLM
PVT
MILES
0
1
2
3
4
N

DOCUMENT STRUCTURE

The Forest Service has prepared this environmental assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This environmental assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into FIVE parts:

- ***Introduction:*** Includes information on the history of the project proposal, the purpose of and need for the project, the agency's proposal for achieving that purpose and need, and public involvement.
- ***Alternative Discussion:*** Provides a detailed description of the alternatives for achieving the stated purpose. Alternatives were developed based on significant issues raised by the public and Forest Service. A comparison table of the activities of each alternative is included. Mitigation measures that would prevent adverse effects to the environment, through alternative implementation, are listed.
- ***Affected Environmental and Environmental Consequences:*** Describes the existing condition of each resource and the effects each alternative would have on the environment. The effects of the No Action Alternative provide a baseline for evaluation and comparison of the other alternatives.
- ***Agencies and Persons Consulted:*** Provides a list of preparers and agencies consulted during the development of the environmental assessment.
- ***Appendices:*** The appendices provide more detailed information to support the analyses presented in the environmental assessment.

INTRODUCTION

The Bend-Ft. Rock (BFR) Ranger District of the Deschutes National Forest has analyzed vegetation and natural fuel reduction treatments within the Aspen planning area to identify and prioritize specific areas across the landscape that have a high risk of natural disturbance**.** The proposed thinning and fuel reduction activities would treat those high risk areas and are intended to develop, enhance, and maintain wildlife habitat while sustaining, enhancing, and protecting long-term productivity and resiliency of the forested ecosystem. The proposed treatments would reduce the risk of natural disturbance to levels likely encountered in the historic past.

The planning area is the second of five deer winter range habitat units (WRHU) to be assessed within the larger Devil's Garden planning area. The planning area, approximately 15,095 acres including 390 acres of other ownership, is located in the southeast portion of the BFR District, approximately 25 air miles southeast of Bend, Oregon (**Figure 1, page 4)**. The Forest Plan allocates two (2) management areas (MA) (**Figure 2, page 5**) within the planning area: Deer Habitat (MA-7, 13,810 acres) and Old Growth (MA-15, 880 acres). The legal description is Township 22 South, Range 16 East, Sections 26-28,33-35; Township 23 South, Range 15 East, Sections 12,13,24,25,36; and Township 23 South, Range 16 East, Sections 2-4,7-11,14-23,28-33. There are no inventoried (RARE II) roadless areas or known Threatened or Endangered species.

Purpose Of And Need For Action

The Aspen project has been initiated in response to concerns and opportunities regarding: 1) natural fuel levels that increase the risk of high intensity wildfire to winter habitat of mule deer, stands of old growth, mature ponderosa pine, and ponderosa pine plantations; 2) insect infestation to high density ponderosa pine stands; 3) juniper encroachment into mountain mahogany stands; 4) enhancement of aspen stands; and 5) off highway vehicle (OHV – four wheel drive and all terrain vehicle (ATV)) activity.

Wildlife Habitat: Optimum habitat is a mosaic of cover and forage distributed across the landscape with little or no disturbance. Productivity and diversity of herbaceous plants (grasses and forbs), shrubs, and tree age classes are necessary to provide cover and forage over time. Older, taller bitterbrush is important winter deer forage while early spring greening herbaceous plants are important for post-winter energy recovery. Having a diversity of age, structure and spatial arrangement of forage and cover is important for providing quality habitat and resilience from

major disturbances such as fire, insects, and disease. Historic park-like landscapes of late-successional, old growth ponderosa pine habitat are preferred by some wildlife species. Breaking up fuel continuity to protect sensitive habitat and open, park-like stands assists in providing for habitat diversity. There is a need to revitalize or enhance, maintain, and protect desirable vegetative shrub and tree composition and structure that meets the needs of a variety of wildlife and plant species. There is a need for enhancement and restoration of mountain mahogany and aspen stands.

Fuels and Forest Health: Although endemic levels of insects are present, small areas of tree mortality indicate increased activity and susceptibility to outbreaks. Areas of highest concern are primarily in dense stands of trees where competition for light and moisture limits stand vigor.

The unintended consequences of a very effective wildfire-fighting program has resulted in the absence of the historical fire regime of frequent, low intensity fires. With the corresponding change in forest structure, wildfires have become larger, more dangerous, and more difficult to control. Fire suppression efforts have allowed accumulations of high levels of natural fuels, primarily mature and late seral shrubs (bitterbrush and sagebrush). Bitterbrush is a highly flammable shrub with oils within the leaves that increase the flammability during the hot, dry summer months. Reducing shrub height reduces flame height and fire intensity making tree crowns less susceptible to wildfire. Natural fuels (needle cast, brush, grasses, dead and down woody material) at the base of large ponderosa pine trees increase the risk of tree mortality from wildfire. Recent wildfires in similar habitats have been difficult to control and damaged or destroyed large amounts of critical mule deer winter forage, other wildlife habitat, and private property.

Natural regeneration and establishment of bitterbrush, ponderosa pine, and mountain mahogany in low productivity, low moisture habitats following wildfire can be difficult to achieve and may not provide viable deer habitat for many years. The difficulty of re-establishment of ponderosa pine and mountain mahogany may be observed in areas within the planning area that were impacted by the 1959, 15,575 acre (Forest Service) Aspen Flat wildfire. In addition, the invasiveness of juniper has contributed to the difficulty of the establishment and survival of mountain mahogany**.**

There is a need to modify the dynamics within the planning area through the judicious use of fire and non-commercial thinning to improve overall forest health and protect Forest investments.

Old Growth: An old growth reserve is centrally located within the planning area. Old growth areas are managed to provide large trees, abundant standing and downed dead trees, and multiple canopy heights except in lodgepole pine where a single canopy level is common. Surrounded by winter deer habitat, this old growth area provides habitat for mule deer, white-headed woodpecker, northern goshawk, flammulated owl and other species of wildlife. The shrub component of bitterbrush, sagebrush, and forbs is typical of the majority of the deer winter range. Large ponderosa pine, typically resistant to low and moderate intensity wildfire, is present throughout. There is a need to protect both habitat and the old growth ponderosa pine from high intensity wildfire by reducing natural fuels accumulations and structure.

Road Management: Approximately 102 open road miles are located within the planning area. There are roads that are parallel to or access the same destination. Roads cause a direct reduction in the amount of available effective wildlife habitat and an increase in wildlife displacement. Road-associated human activity can adversely affect wintering mule deer by increasing deer activity with an associated expenditure of energy, decreasing critical fat reserves needed for winter survival. Roads also increase vulnerability of deer to hunting and poaching pressure. Open road density is approximately 4.3 miles per square mile with a desired open road density of 2.5 miles or less per square mile (Forest Plan, M7-22, page 4-115). There is a need to provide public access for traditional recreational experiences, special uses, and administrative activities while maintaining or enhancing deer habitat.

Off Highway Vehicle Management: An increase in off highway vehicle (OHV) use has been occurring across the

Forest and on adjacent non-Forest Service lands. It is anticipated that this trend will continue, particularly in areas that do not presently have OHV restrictions. OHV use may contribute to the disturbance of resources, including, but not limited to, the disturbance of mule deer in critical winter deer habitat. There is a need to manage OHV use to avoid future resource damage and enhance winter deer habitat by reducing habitat fragmentation and disturbance to wintering mule deer.

Alternative 2 (Proposed Action)

The proposed action identifies measures that address the conditions within the critical winter habitat of mule deer. The original Alternative 2 (Proposed Action), sent to the public for scoping comments, proposed approximately 65 more acres than are now proposed. One original unit (unit 10) has been deleted from proposed underburning. Other acres were determined to be inaccurate. Spring and fall underburning were combined into the Underburn: Springlike Conditions category (**Table 1).** Further discussion of all alternatives begins on page 11.

Proposed thinning and fuels treatments are intended to sustain, enhance, and protect critical deer winter habitat on approximately 3,645 acres, including: 1) protection and enhancement of planted ponderosa pine used for hiding and thermal cover; 2) protection of mature, yellow-barked ponderosa pine; and 3) protection of the old growth management area from wildfire. **Table 1** displays the proposed vegetation activities. Units with fuels treatment would have variable amounts of each acre that are treated. Refer to **Tables 2 and 3, page 12** for proposed units, **Table 4, page 13** for a detailed description of treatments and objectives, and **Figure 3**, **page 14** for proposed unit locations. **All measurements are approximate**.

Table 1: Alternative 2 (Proposed Action) – Proposed Activities

Treatment Type	Acres	Description
Mechanical Shrub Treatment	320	Mow Shrubs
Non-commercial thin and Mechanical Shrub Treatment	1,080	Non-commercial thin and Mow Shrubs
Burn Under Trees	1,280	Burn under late and old structure ponderosa pine
Underburn: Springlike Conditions	970	Underburn
Aspen Enhancement	30	Non-commercial thinning of conifers
Juniper Removal	610	Juniper removal, leaving clumps of old-growth juniper
Total Acres	**4,290**	

Road Management: Approximately 20.4 miles of 102 miles of open system roads are proposed for closure or decommissioning. Road miles would be reduced from approximately 4.3 miles per square mile to approximately 3.5 miles per square mile, moving road density toward the Forest Plan objective of 1.0 to 2.5 miles per square mile (Forest Plan, M7-22, page 4-115). Refer to **Figure 5, page 17** for proposed road closures.

Off Highway Vehicle (OHV) Management: Forest system roads are presently open for OHV use. Use of OHVs off of Forest system roads would be prohibited unless an area is designated open to off-road travel.

Decision To Be Made

Based on this analysis, the District Ranger, Bend-Ft. Rock Ranger District, Deschutes National Forest, will decide whether to:

1. Protect wildlife habitat by reducing natural fuels to reduce the risk of high-intensity wildfire.
2. Improve forest health by using prescribed burning and non-commercial thinning to reduce stand density.
3. Improve wildlife habitat by providing a mosaic of shrub habitat, encouraging the reestablishment of mountain mahogany, and enhancing aspen habitat.
4. Improve wildlife habitat by reducing disturbance to big game through road closure and decommissioning.

Documents Tiered To

- 1990 Deschutes National Forest Land and Resource Management Plan (**Forest Plan**) and its accompanying Final Environmental Impact Statement as amended by the Revised Continuation of Interim Management Direction

Establishing Riparian, Ecosystem, and Wildlife Standards for Timber Sales (Eastside Screens): "The National Forest Land and Resource Management Plan (Forest Plan or Plan) was developed to guide all natural resource management activities and establish standards/guidelines for the Deschutes National Forest. The purpose of the Forest Plan is to provide form the use and protection of Forest resources, fulfill legislative requirements, and address local, regional, and national issues and concerns."

Documents Incorporated By Reference

- 1998 Deschutes National Forest Integrated Fuels Management Strategy (**IFMS**): "The IFMS provides guidance for prescribed fire, mechanical brush mowing, and small diameter tree thinning and release.." "The IFMS Recommended Strategic Actions are not required to implement the natural fuels activities, but were developed to assist the Forest with program development towards meeting long-term goals in an integrated, adaptable and effective manner."
- 1998 Deschutes National Forest Noxious Weed Control EA: "Together, the EA and IWMP (Integrated Weed Management Plan) represent an effort to manage noxious weeds on the Deschutes National Forest in a manner consistent with direction provided in the Regional Final Environmental Impact Statement for Managing Competing and Unwanted Vegetation, its Record of Decision, and the associated Mediated Agreement."

Availability Of The Planning Record

Specialist reports used in the preparation of this environmental assessment are on file at the Bend-Fort Rock Ranger District office. The specialist reports are summarized in this document.

Management Allocations And Direction

The following is a brief summary of the goals and desired condition of each Forest Plan Management Area (MA) (**Figure 2, page 6**) located within the planning area. Consistency, of the proposed activities and environmental effects, with the relevant standards and guides of the Forest Plan are located in **Appendix A, page 55**.

- **Deer Habitat** (MA-7, 13,810 acres): **Goals** – Manage vegetation to provide optimum habitat conditions on deer winter and transition ranges while providing some domestic livestock forage, wood products, visual quality and recreation opportunities. **Desired Condition** – Vegetation will be managed to provide optimum habitat considering the inherent productivity of the land. Herbaceous vegetation will be managed to provide a vigorous forage base with a variety of forage species available. Long-term tree or shrub cover will be retained to moderate cold weather conditions. Cover should be up to 40 percent of the land area. Approximately 75 percent of the cover areas should be thermal cover with the remainder being hiding areas. Some stand conditions may provide both thermal and hiding cover.
- **Old Growth** (MA-15, 880 acres): **Goals** – Provide for naturally evolved old growth forest ecosystems for: 1) habitat for plant and animals associated with old growth forest ecosystems, 2) representations of landscape ecology, 3) public enjoyment of large, old-tree environments and 4) the needs of the public from an aesthetic spiritual sense. These areas will also contribute to the biological diversity of the Forest. **Desired Condition** – Old growth forests will be managed to provide: 1) large trees, 2) abundant standing and down dead trees, and 3) vertical structure (multiple canopy layers), except in lodgepole pine where a single canopy layer is common. Distribution and minimum size of old growth areas were based on habitat requirements of three (3) wildlife indicator species. Refer to the Forest Plan for additional information. Some old growth areas are also representatives of 'landscape ecology' and provide areas to study old growth plant succession.

Also located within the planning area are private and Bureau of Land Management lands. Proposed vegetative activities are not located immediately adjacent to these lands.

Public Involvement/Scoping Process Used

A Forest Service letter requesting public involvement was provided in July of 2002 to approximately 65 individuals, businesses, and organizations that have expressed an interest in the project development process. Included in the mailing was The Bulletin, the local newspaper that reported on the proposed actions. The scoping letter was also placed on the United States Forest Service (**USFS**) web site. The proposed Aspen project was included in the Central Oregon Schedule of Projects in the 2003 winter edition. This notification, through quarterly mailings, reaches approximately 3,200 interested individuals and groups.

Comments Received

Three (3) scoping response letters of interest were received from the public. Two (2) of the responses offered comments. One (1) letter expressed an interest of receiving official documents as they become available, including the EA and Decision Notice. All comments received have been assessed as to their relevance to each of the resources being addressed within the Aspen planning area. Some comments have been addressed in the proposed action, alternative development, and analysis of the effects of actions. Some comments were used to explore alternatives that were not further developed. Internal Forest Service comments and analysis were also used in the development of alternatives. The following comments were in support of or statements regarding the project:

- The project falls within the usual and accustomed (U&A) lands, areas that were traditionally used for gathering foods and for hunting.
- The CTWS (Confederated Tribes of Warm Springs) supports the fuel management activities and goals towards habitat diversity, as well as the multi-species planning effort.
- The CTWS also supports the effort towards road management.

Issues Used In Alternative Design

The following issues were the basis for designing Alternative 3. Each issue statement is followed by a more detailed explanation. Each issue has a unit of measure developed for the reader to easily distinguish between each alternative and how it responds to the issue. Proposed activities of alternatives are compared in **Table 6, page 18**.

Issue #1: *As a result of many years of fire suppression, conifers are beginning to encroach in shrub areas that provide valuable forage for big game.*
Discussion: *To provide a continuance of forage in the fringe habitat of the forest/desert, removal of encroaching conifer would be best at this time.*
Unit of Measure: Acres of conifer removal.

Issue #2: *Specific areas do not have thinning proposed to reduce fire risk in deer winter range.*
Discussion: *The intent of this project is to enhance and protect deer winter range. To reduce fire risk in strategic locations of the planning area while maintaining habitat, additional units are proposed for thinning treatments.*
Unit of Measure: Acres of thinning.

Issue #3: *Because deer hiding cover on the forest/desert fringe area is low, it is important to reduce the opportunity for the harassment of the wintering deer herd in the Aspen planning area through road closure or decommissioning.*
Discussion: *It is being proposed that roads be closed or decommissioned. Implementing this activitiy would reduce vulnerability of deer from intentional and unintentional harrassment.*
Unit of Measure: 1) Miles of road closure and decommissioning.

Other Comments And Concerns

Other comments and concerns were identified that are outside the scope of the purpose and need, are opinions, or provide no scientific evidence.

Comment: More emphasis needs to be put on commercial thinning as well as pre-commercial thinning. ***Response:*** *An alternative was considered to provide a commercial harvest. The size and distance from a commercial center precludes an economical harvest.*

Comment: We do not support road closures just for the sake of closing X number of miles of road. Look at the positive thing to weigh against negative before you automatically start closing many of the existing roads in these areas. ***Response:*** *Even though the Forest Plan describes a desired road density for the various Management Areas, including deer winter range, it is a target density, not an uncompromising density. Closing roads in the Aspen planning area is a tool to provide areas of reduced harassment to wildlife, the primary reason for proposed road closures and decommissioning.*

Comment: Wildlife enhancement by removing junipers to release mountain mahogany is encouraged. Mechanical thinning operations are more friendly to these important mule deer forage species than prescribed burning. ***Response:*** *The proposed activity to remove juniper and promote mountain mahogany will be done by using hand tools, not prescribed burning.*

Comment: We encourage you to actively manage your ponderosa pine plantations in order to protect your prior investments. These plantations need to be managed along with the dense unmanaged stands to reduce stocking levels. ***Response:*** *Many of the stands that are proposed for non-commercial thinning are plantations. Other plantations are younger and not as established and will be treated at a later date.*

Comment: Economic factors should be given consideration to what added benefits are gained by doing those proposed activities. These economic decisions need to be heavily weighted to commercial activities than non-commercial activities. ***Response:*** *This project is emphasizing enhancement and protection of deer habitat. A commercial aspect was considered and determined not to be an economically viable option at this time.*

Comment: In reference to Old Growth, you can grow trees larger and quicker under active management than in the hands off approach. ***Response:*** *Growing trees quicker that are larger is not the primary reason for Old Growth Management Areas. A portion of one Old Growth Area is proposed for fuels reduction through prescribed burning. Old Growth Areas in the Aspen planning area are providing valuable habitat for big game and other old growth dependent wildlife species. Management activities are not precluded within these areas.*

ALTERNATIVE DISCUSSION

This section provides discussion of a no action alternative and two (2) action alternatives. It also includes a brief discussion of alternatives that were considered and responds to why they were eliminated from further analysis.

Alternatives Considered But Eliminated From Detailed Analysis

One alternative was considered to provide a commercial harvest from proposed thinning units. Commercial sized trees are intermixed with non-commercial sized trees in units proposed to reduce crown density. It was determined that the small size (10 inches or smaller diameter at breast height (dbh)), quantity, and the distance from Bend or other towns would not provide an economically viable harvest.

Alternatives Considered In Detail

This section presents a detailed description of the alternatives responding to the "Purpose and Need" that are

considered to be reasonable and viable by the Decision Maker (District Ranger, Bend-Fort Rock Ranger District). Alternatives, other than the no action alternative, are designed to move towards the desired condition consistent with the standards and guidelines of the Forest Plan. **All measurements are approximate.**

Alternative 1 (No Action)

Under this alternative, the Forest Service would continue to manage the planning area under current Forest Plan direction. The existing condition is included under the heading "Affected Environment and Environmental Consequences" for each specialty discussion. The discussion that describes the affected environment and resources of the area are summaries of detailed specialist reports found in the Project Record located at the Bend-Fort Rock District Office. No vegetation/fuels reduction treatments or wildlife enhancement activities would occur. This alternative provides a baseline, which compares relative changes and their effects that would occur with implementation of proposed activities in either Alternative 2 (Proposed Action) or Alternative 3. Current conditions and trends would likely remain unchanged with selection of the No Action Alternative.

Alternative 2 (Proposed Action)

Vegetation: Approximately 4,290 acres are proposed for treatment. **Figure 3, page 14** identifies the Alternative 2 (Proposed Action) proposed units and treatment type. **Table 2** provides proposed activity summaries. Where fuels treatments are proposed, the acreage to be treated will be variable and dependent upon site-specific needs; approximately 60 percent of a unit with fuels treatments would be mowed and/or burned. Refer to **Table 4, page 13** for description and objectives of treatments.

Table 2: Alternative 2 (Proposed Action) – Proposed Activities

Treatment Type	Unit Number*	Acres
Mechanical Shrub Treatment (MST)	1,7,11,15,17,24,30	320
Non-commercial Thinning (PCT) and MST	2,3,4,5,6,8,9,12,13,14,16,19,20,21 22,23,25,29,31,32,33,34,35,36	1,080
Underburn Spring-like Conditions	26,27,28,41,42,43,46	970
Burn Under Trees	38,39,40,44,45	1,280
Aspen Release/Extend Fence	18	30
Juniper Removal	37	610
Total		**4,290**

***** Unit 10 (23 acres) was originally proposed in Alternative 2 (Proposed Action). After further discussion, Unit 10 has been eliminated from action alternative consideration and analysis.

Alternative 3

Fuels and Vegetation: Approximately 4,390 acres are proposed for treatment. **Figure 4, page 15** identifies Alternative 3 proposed units and treatment type. **Table 3** provides activity summaries. Where fuels treatments are proposed, the acreage to be treated will be variable and dependent upon site-specific needs; approximately 60 percent of a unit with fuels treatments would be mowed and/or burned.

Table 3: Alternative 3 – Proposed Activities

Treatment Type	Unit Number	Acres
Mechanical Shrub Treatment (MST)	1,7,11,15,17,47	200
Non-commercial Thinning (PCT) and MST	2,4,5,6,8,9,12,13,14,16,19,20,21 22,23,25,33,34,35,36	890
Non-commercial Thinning (PCT)	3, 24,48,50	350
Underburn – Spring-like Conditions	27,28,42	340
Burn Under Trees	26,38,39,40,43,45,46	1,420
Aspen Release/Extend Fence	18	30
Juniper Removal	37	610
Conifer Removal	49	550
Total		**4,390**

Description of Alternative 2 (Proposed Action) and Alternative 3 Treatments: Table 4 describes the proposed treatments and overall objectives for these treatments.

Table 4: Description of Proposed Activities		
Treatment Type	**Treatments**	**Objectives**
MST: Mechanical Shrub Treatment	Use of mechanized equipment to mow, cut, chop, grind or otherwise reduce shrub or ground fuel vertical structure. Equipment and attachments would be chosen based on soils (compaction and displacement potential), terrain, other resource concerns, cost and availability.	Reduce natural fuels to reduce risk of wildfire while promoting a more balanced ratio of growth stages of bitterbrush – early, mid and late seral.
PCT: Non-commercial Thinning	Removal of dead and/or live trees, generally less than 10 inches in diameter at breast height (dbh - 4.5 feet above ground on the tree stem).	Reduce crown and stem density that would disconnect the canopies of trees and reduce ladder fuels that would carry fire from the ground into the forest canopy. Reduce risk of wildfire; enhance bitterbrush growth. Reduce the risk of insect infestations.
UB: Underburn – Spring like Conditions	Use of prescribed fire under a stand of trees	Decrease or remove accumulated ground fuels during periods of spring like moisture to reduce risk of wildfire.
Burn Under trees	Burn under the drip line of the canopies of the trees	Promote or protect late, single-story stand structure; provide pine protection from wildfire; maintain deer forage
Aspen Release	Removal of conifers up to 6" dbh* from aspen stand; associated project would perform maintenance on the existing fence around the stand, extend approximately 200 feet.	Reduce conifer competition within the aspen stand and protect aspen stand from grazing
Juniper Removal	Removal of junipers less than 8" dbh.	Enhance the mountain mahogany within the stand
Conifer Removal	Removal of conifers in porcupine flat.	Reduce conifer encroachment into open area

FIGURE 3

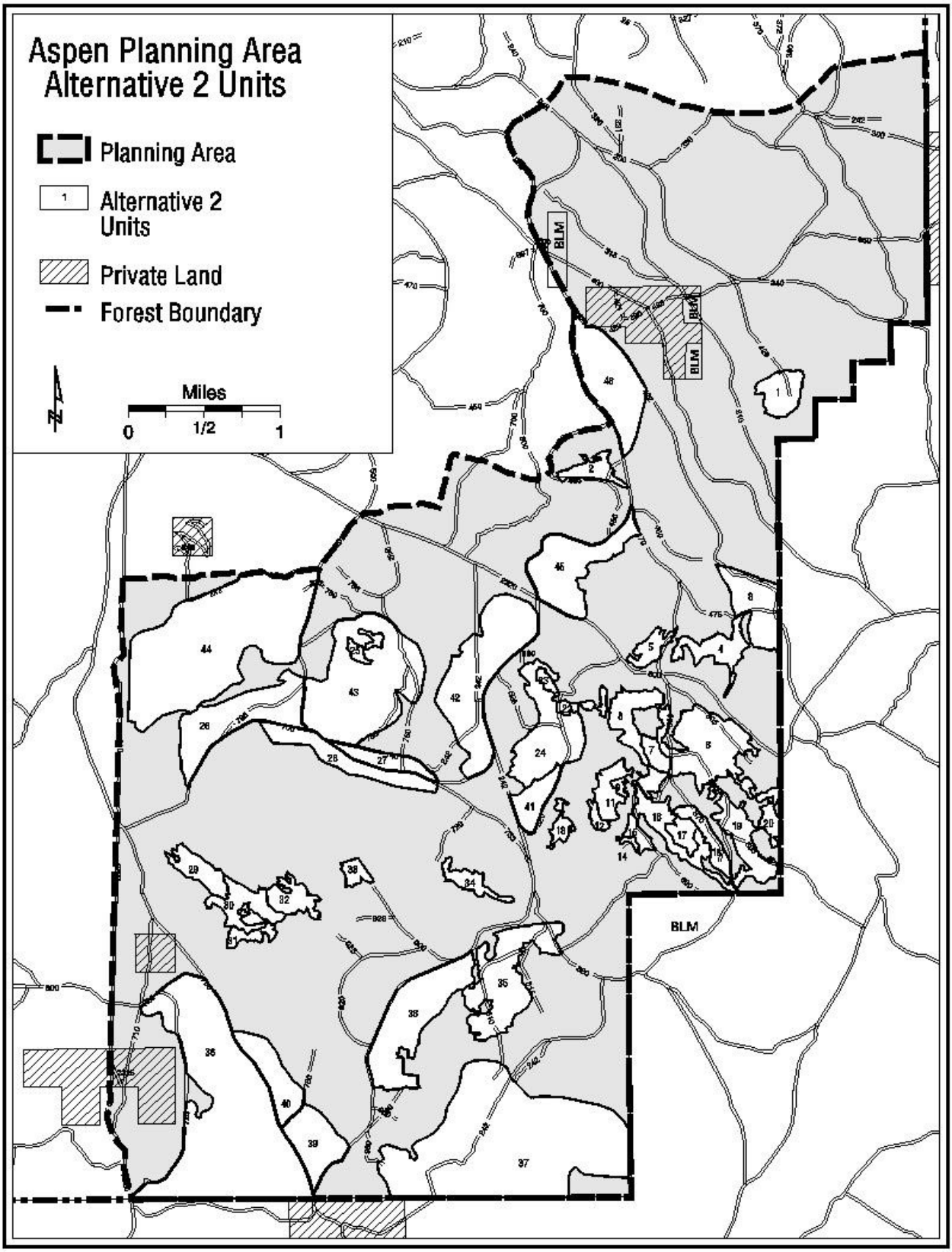
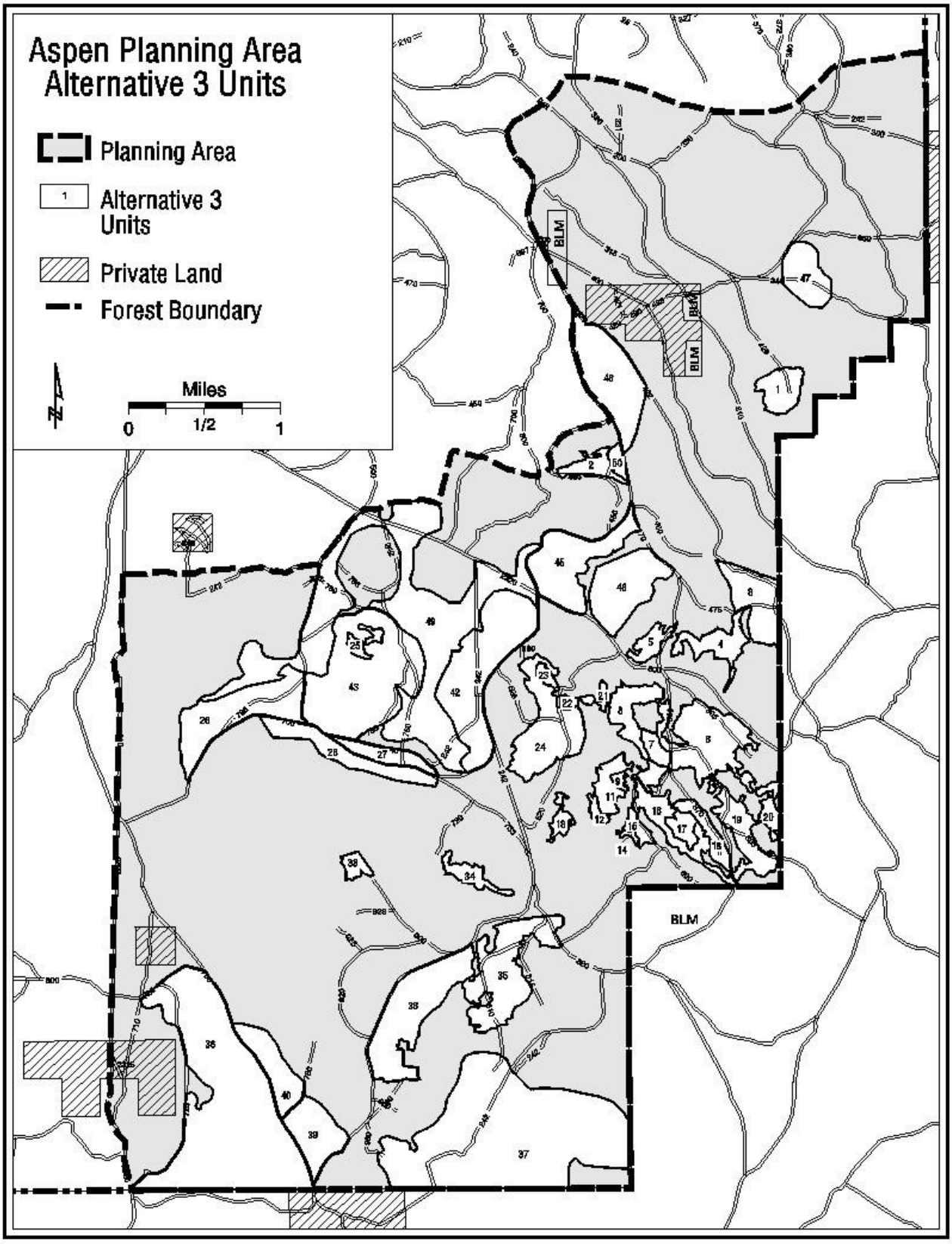

Aspen Planning Area
Alternative 2 Units
Planning Area
1
Alternative 2 Units
Private Land
Forest Boundary
Miles
0
1/2
1
BLM
BLM
BLM
BLM

FIGURE 4


Aspen Planning Area
Alternative 3 Units
Planning Area
Alternative 3 Units
Private Land
Forest Boundary
Miles
0
1/2
1
BLM
BLM
BLM
BLM

Proposed Activities Common to Alternative 2 (Proposed Action) and Alternative 3

The following proposed activities are common to both of the action alternatives. These activities are not fuels or vegetation activities although they are consistent with the wildlife objectives.

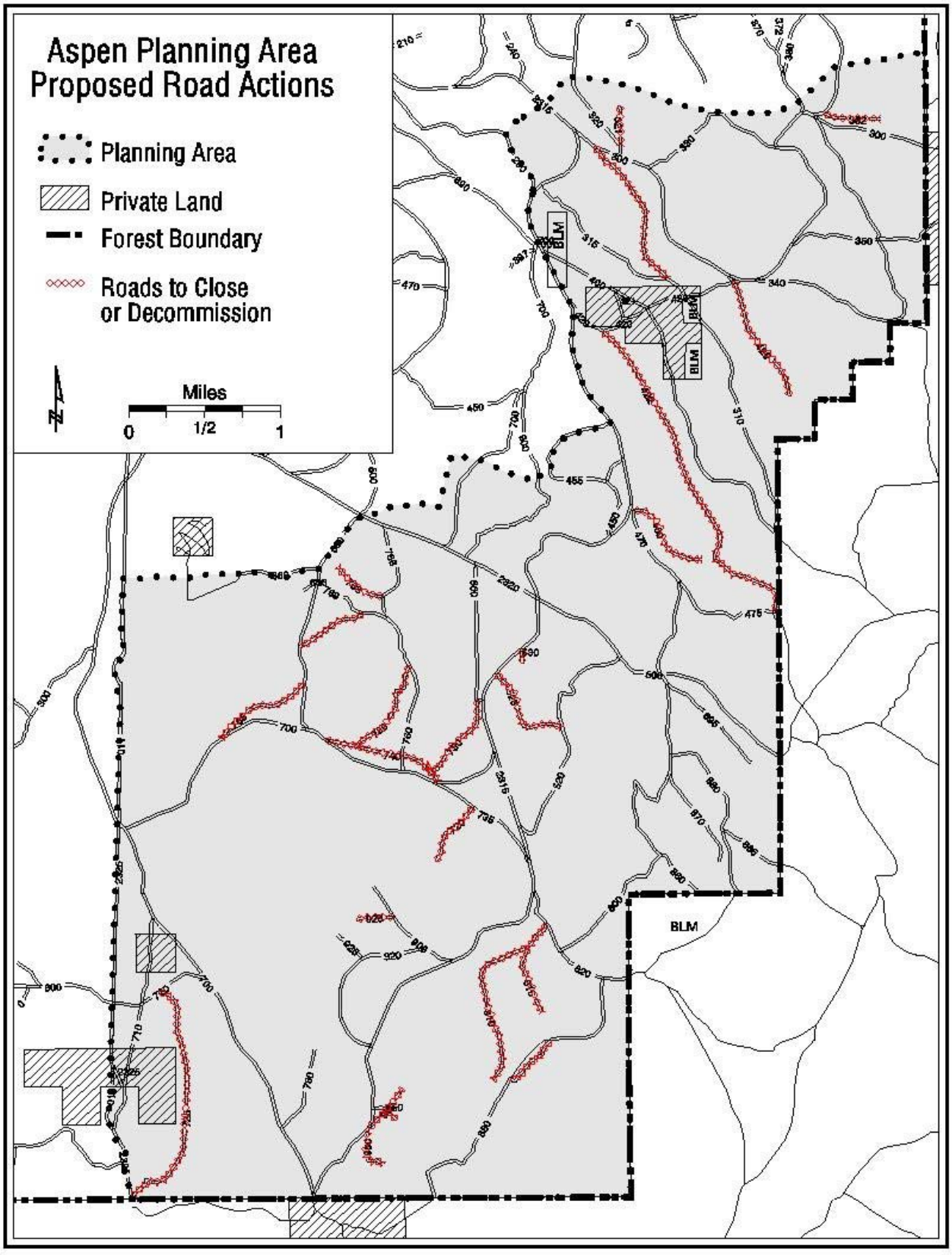
Unit 18 is proposed for aspen release by removal of conifer competition. It is proposed that the fence surrounding the guzzler within an aspen stand be upgraded through repairs and expanded to encompass the aspen stand. Approximately one (1) mile of fencing will be constructed to exclude livestock grazing.

The following roads are proposed for closure or decommissioning (**Figure 5, page 17 and Table 5**). These roads have been determined to be unnecessary for management purposes or are parallel to other roads providing access to the same destination.

Table 5: Proposed Road Closure and Decommissioning

Road Closure		Road Decommission	
Road Number	**Miles**	**Road Number**	**Miles**
2315340	2.65	2315810	1.33
2315350	0.95	2315815	0.50
2315382	0.15	2315900	0.76
2315400	1.38	2315920	1.20
2315426	0.90	2315925	1.40
2315460	0.70		
2315669	0.40		
2315720	0.33		
2315725	1.67		
2315740	0.80		
2315760	0.66		
2315768	0.40		
2315769	0.40		
2315780	0.76		
2315785	0.66		
2315837	0.40		
2315860	038		
2315895	0.82		
2315928	0.28		
2315980	0.50		
Total	**15.19**	**Total**	**5.19**

FIGURE 5


Aspen Planning Area
Proposed Road Actions
Planning Area
Private Land
Forest Boundary
Roads to Close or Decommission
Miles
0
1/2
1
BLM
BLM
BLM

Comparison of the Alternatives

Table 6 compares the alternatives in relation to the activities proposed in Alternative 1 (No Action), Alternative 2 (Proposed Action), and Alternative 3.

Table 6: Comparison of Alternatives			
Activity	**Alternative 1 (No Action)**	**Alternative 2 (Proposed Action)**	**Alternative 3**
Burn Under trees: Acres	0	1,282	1,422
UB: Underburning – Spring like Conditions: Acres	0	968	338
MST: Mechanical Shrub Treatment: Acres	0	318	198
PCT: Non-commercial Thinning Only: Acres	0	0	347
PCT and MST: Acres	0	1,079	892
Aspen Release: Acres	0	31	31
Mountain Mahogany Enhancement/Juniper Removal: Acres	0	612	612
Conifer Removal: Acres	0	0	550
Total Vegetative Treatment Acres	**0**	**4,290**	**4,390**
Road Closure: Miles	0	15.2	15.2
Road Decommissioning: Miles	0	5.2	5.2
Aspen Fence Construction: Feet	0	200	200

MITIGATION MEASURES AND BEST MANAGEMENT PRACTICES

Common To Alternative 2 (Proposed Action) And Alternative 3

Wildlife

1. In precommercial thinning units larger than 40 acres, retain 20 percent of the unit in clumps from 2 to 6 acres in size and 600 to 1200 feet apart.
2. Retain all snags (hard and soft) except when impractical because of human safety, other resource protection, or project logistics.
3. In general, retain unburned clumps of vegetation distributed throughout the units. Unburned clumps should be those with either or a combination of coarse woody material (CWM) and snags.
4. Avoid direct ignition of CWM material that is greater than or equal to 10 inches in diameter and 20 feet in length and snags. Fire prescription parameters will ensure that consumption will not exceed 3 inches total (1.5 inches per side) of diameter reduction in featured logs (Eastside Screens).
5. During mechanical shrub treatment operations, leave an untreated buffer (25 foot radius) around CWM that is greater than 10 inches in diameter and 20 feet in length.
6. Connectivity corridors will not be treated.
7. To avoid negative effects to birds including nest destruction, loss of broods, and direct mortality of adults do not conduct mechanical shrub treatments or burning, unless approved by the wildlife biologist, during the period of April 1 to August 15.
8. If raptor nest sites are discovered during unit layout or while implementing treatments, immediately contact a wildlife biologist to assess the situation. Ensure that all contracts contain specifications that address this potential situation. Seasonal restrictions for either or a combination of active nests and modifications to vegetation/fuel treatment prescriptions may be required in order to provide protection to nesting raptors and to meet management direction (LRMP Standard WL- 2, 3, 11, 19, 27, 28, and 31. Eastside Screens).

Soils

9. Include soil moisture guidelines in burn plan to minimize the risk of intense fire and adverse impacts to soil and water resources (LRMP SL-1 & SL-3; Timber BMP T-2, T-3 & T-13; Fuels Management BMP F-2, F-3).
10. Strive to maintain the duff layer and fine organic matter (woody materials less than 3-inches in diameter) over at least 65 percent of an activity area.
11. Retain a minimum of 5 to 10 tons per acre of large woody debris (greater than 3-inches in diameter) on ponderosa pine sites (LRMP SL-1).

12. Road Maintenance – conduct regular preventive maintenance to avoid deterioration of the road surface and minimize the effects of erosion and sedimentation (Road BMP R-18, R-19).
13. Restrict machinery operations on slopes greater than 30 percent to previously disturbed sites (such as existing roads, old skid trails) at all times. Machine piling of slash would not be authorized off designated areas in activity areas (Units 8, 22, and 35) that contain slopes over 30 percent.
14. Use mechanical fuel reduction methods that minimize the extent of new soil disturbance. Options include some or all of the following: 1) Use existing roads and logging facilities (whenever possible), and limit the amount of traffic off these previously disturbed sites. On slopes less than 30 percent, the use of specialized machinery will be authorized to make no more than two equipment passes on any site-specific area, 2) avoid equipment operations when soils are extremely dry and subject to excessive soil displacement, 3) avoid equipment operations during periods of high soil moisture, when equipment tracks sink deeper than during dry or frozen conditions, and 4) operate equipment over frozen ground or a sufficient amount of compacted snow to protect mineral soil. Equipment operations will be discontinued when frozen ground begins to thaw or when there is too little compacted snow and equipment begins to cause soil-puddling damage (rutting).
15. Limit the disturbed width of machine-built fireline to no more than 36 inches. Consider either or a combination of mowing and mulching and the use of wet line to achieve fireline objectives, whenever possible.

Soil Best Management Practices (BMPs)

16. Protect Soils during prescribed burn operations: A burn plan addressing compliance with all applicable Forest Plan standards and guidelines and Best Management Practices will be completed before the initiation of prescribed fire treatments in planned activity areas. Prescribed burn plans need to include soil moisture guidelines to minimize the risk of intense fire and adverse impacts to soil and water resources (LRMP SL-1 & SL-3; Timber BMP T-2, T-3 & T-13; Fuels Management BMP F-2, F-3). *Moderate-high effectiveness.*
17. Maintain duff layer: Strive to maintain the duff layer and fine organic matter (woody materials less than 3-inches in diameter) over at least 65 percent of an activity area. The preference is for the fine organic matter to be undisturbed, but, if disturbed, it should be of sufficient quantity and quality to avoid detrimental nutrient cycle deficits (short term nutrient cycling). If the soil and potential natural plant community (i.e., site) are not capable of producing fine organic matter over 65 percent of the area, adjust minimum amounts to reflect potential soil and vegetation capabilities (LRMP SL-6; Fuels Management BMP F-2; Timber Management BMP T-13). *Moderate effectiveness.*
18. Coarse Woody Debris/Down Wood: Assure that on Ponderosa Pine sites, a minimum of 5 to 10 tons per acre of large woody debris (greater than 3-inches in diameter) is retained within activity areas to provide organic matter reservoirs for nutrient cycling that helps maintain long-term site productivity (LRMP SL-1). *Moderate effectiveness.*
19. Road Maintenance: Conduct regular preventive maintenance to avoid deterioration of the road surface and minimize the effects of erosion and sedimentation (Road BMP R-18, R-19). *Moderate-high effectiveness.*

Silviculture

20. No more than 50 percent of the live crown ratio of dominant and co-dominant ponderosa pine should be scorched during proposed underburns.
21. In older, larger tree thinning units (units 3, 24, 35, 36 and 48), yard thinned trees with tops attached to remote (at the edge of or outside of unit) landings for slash burning.
22. Lop and scatter slash in non-commercial thinning only units (non-shear units).
23. Masticate (break up) slash in mechanical thinning treatments to desired fuels profiles.
24. Skid roads, temporary roads, and landings would be designated so visibility is minimal along travel routes and dispersed campsites.
25. Roads created through thinning and fuels reduction activities would be obliterated following treatments.
26. Slash piles would be burned.
27. Post treatment reviews will be completed to monitor activities, determine if objectives were met and if not, to determine if additional treatments are needed.

Botany

28. Use contract and permit clauses to prevent the introduction or spread of noxious weed by contractors and permittees (CT6.35 Equipment Cleaning in the FS-2400-6 and -6T Contracts).
29. Do not park or drive vehicles in diffuse knapweed and cheatgrass sites. Flag sites if necessary for avoidance.
30. Monitor for 2 years following work completion, map new weed sites, and pull weeds as necessary.
31. Water for dust abatement and fire control will be acquired where access to water is weed-free.
32. All fire lines would be restored by raking back the organic matter that was moved.
33. If possible, remove small conifers from Porcupine Flat during fall or winter when pumice grapefern is dormant. If activity is to take place in spring or summer, avoid grapefern sites using flagging if needed.
34. Avoid pockets of cheatgrass within Unit 18, aspen release.

Cultural

35. Known cultural sites within proposed units would be flagged for avoidance prior to implementation of proposed activities.
36. Under Alternative 3, the use of machinery during thinning will be conducted over snow or frozen ground and remain on previously disturbed areas when possible.
37. A qualified REC 7 or archaeologist would be on-site during ground disturbing activities in units proposed for non-commercial thinning with mechanized equipment and during fire line construction. If cultural sites are found during project activities, activities would cease until the site is evaluated. Following evaluation, the project could continue by 1) site avoidance; 2) data recovery prior to work continuance; or 3) modification of work activity to reduce or eliminate the effects.

Range

38. Reconstruct metal or wood fences if damaged during treatments.
39. Current Trend (CT) Study Plots and Parker 3-step enclosures and surrounding study areas would be flagged prior to treatments. These flagged areas would be avoided during treatments.
40. Leave 25-foot buffer around the water set to reduce cheatgrass spread, if present.
41. Range specialists will review contracts and burning plans prior to approval and implementation.

The following treatment units contain range improvements that need protection (Table 5). Refer to Appendix 2 of the range specialists report in the Administrative Record for maps of range improvements/resources that have "special" concerns (units 6, 28, 38, 39, and 43).

Vegetation Treatment Units that contain Range Improvements

Unit	Issue Of Concern	Legal Description
2	Protect Barbed Wire Fence	T23S, R16E: NE ¼ of Section 9
3	Protect Barbed Wire Fence	T23S, R16E: NE ¼ of Section 15
6	Protect Bitterbrush; Study Cages (2 each)	T23S, R16E: NW ¼ of Section 22
19	Protect Barbed Wire Fence	T23S, R16E: SE ¼ of Section 22
20	Protect Barbed Wire Fence	T23S, R16E: SE ¼ of Section 22
24	Protect Waterset; Avoid Cheatgrass	T23S, R16E: NW ¼ of Section 16
27	Protect Waterset; Avoid Cheatgrass	T23S, R16E: NE ¼ of Section 20
28	Protect Barbed Wire Fence and Natural Barrier	T23S, R16E: Sections 18 and 19
37	Protect Barbed Wire Fence	T23S, R16E: Sections 32 and 33
38	Protect Barbed Wire Fence	T23S, R15E: Section 36 to T23S, R16E: Section 31
39	Protect Current Trend Range Study Plot -10	T23S, R16E: SE ¼ of Section 31
39	Barbed Wire Fence	T23S, R16E: Section 31
43	Protect Barbed Wire Fence	T23S, R16E: Section 18
43	Protect Waterset /Proposed	T23S, R16E: Center of Section 17
45	Protect Waterset /Avoid	T23S, R16E: SE ¼ of Section 9

EXISTING CONDITION AND ENVIRONMENTAL CONSEQUENCES

The Existing Condition and Environmental Consequences section provides the scientific and analytical basis for alternative comparison. Probable effects are discussed in terms of environmental changes from the current condition and include qualitative as well as quantitative assessments of direct, indirect, and cumulative effects. This section describes the beneficial and/or adverse impacts to the environment that would occur if the various alternatives were implemented.

Other supplemental or supporting documentation is located in the appendices of this EA and are referred to in the appropriate discussions within the Existing Condition and Environmental Consequences section of this environmental assessment.

Appendix C, page 63: Wildlife Biological Evaluation
Appendix D, page 71: Botany Biological Evaluation and Noxious Weed Risk Assessment

For more detailed and supporting documentation, please refer to the following specialist reports in the Appendices in the Official Record located at the Bend-Fort Rock District Office.

Appendix B: Wildlife Report
Appendix C: Botany Report
Appendix D: Fire and Fuels Report
Appendix E: Silviculture Report
Appendix F: Soils Report
Appendix G: Cultural Report
Appendix H: Range Report

Wildlife Resource

Desired Condition: Providing high quality winter forage in adequate quantity and distribution to meet nutritional demands of wintering mule deer and adequate shrub structure and patch size to maintain quality habitat for shrub associated species is a primary objective of the Aspen project. Wildlife cover and forage would be in close proximity. Approximately 30 percent of the land area would consist of thermal cover and 10 percent hiding cover. Some stands could satisfy both kinds of cover (LRMP Goal & General Theme and Objectives). Cover should be well distributed throughout the area (LRMP WL-55). Where needed, travel corridors should be provided by linking stands one-half acre or larger that provide cover (LRMP WL-56). Similarly, areas will provide a mosaic of conditions incorporating hiding, thermal, and travel cover (LRMP M-10). Forage conditions would be maintained or improved with an emphasis on increasing the variety of plants available for forage and a mixture of age classes of shrubs. A variety of age classes would be created in areas that are presently dominated by poor vigor shrubs (LRMP M7-14).

PROPOSED, ENDANGERED, THREATENED, AND SENSITIVE (PETS) SPECIES

Existing Condition: The project area is on the periphery of the range of the pygmy rabbit (*Sylvilagus idahoensis*) and the Western sage grouse (*Centrocercus urophasianus phaios*). Potential habitat exists and is marginally suitable, consisting of mixed stands of bitterbrush and sagebrush, isolated from one another by stands with a ponderosa pine overstory. Pygmy rabbits typically occur only in areas dominated by tall, dense stands of Great Basin or big sagebrush and rarely occur where sagebrush is a minor component or lacking from the plant community (Johnson and O'Neil 2001). Western sage grouse are closely associated with sagebrush-dominated lands. Treatment areas providing potential habitat (Units 1 and 37) are largely comprised of mixed stands of bitterbrush and sagebrush. There have been no sightings of sage grouse within the project area. The nearest sighting of sage grouse is over 12 air miles from the project area. Neither of these species has been reported or documented to occur within the project area.

A sighting of two (2) wolverines was reported in the year 2000 approximately five (5) to six (6) miles to the north of the project area. There have been no reported or documented sightings of the wolverine within the project area. No other PETS species have been documented or are suspected to occur within or adjacent to the project area.

Table 7 lists threatened, sensitive, candidate, and species of concern animal species that are either known to occur or may potentially occur on the Bend-Ft Rock District of the Deschutes National Forest.

Table 7: Threatened, Sensitive, Candidate, And Species Of Concern		
Species	**Common Name**	**Federal Classification***
Agelaius tricolor	Tricolored blackbird	S
Bucephala albeola	Bufflehead	S
Centrocercus urophasianus phaios	Western sage grouse	S, SOC
Coturnicops noveboracensis	Yellow rail	S
Falco peregrinus anatum	American peregrine falcon	S
Gulo gulo luteus	California wolverine	S, SOC
Haliaeetus leucocephalus	Northern bald eagle	T
Histrionocus histrionicus	Harlequin duck	S, SOC
Lynx canadensis	Canada lynx	T
Martes pennanti	Pacific fisher	S
Numenius americanus	Long-billed curlew	S
Podiceps auritus	Horned grebe	S
Podiceps grisegna	Red-necked grebe	S
Rana pretiosa	Oregon spotted frog	C
Strix occidentalis caurina	Northern spotted owl	T
Sylvilagus idahoensis	Pygmy rabbit	S, SOC

*** T**=Threatened, **S**=USFS Region 6 Sensitive, **C**=USFWS Candidate species, **SOC**=USFWS Species of Concern

Alternative 1 (No Action)

Direct and Indirect Effects: Management would continue under current direction afforded by the Forest Plan. Conifers would continue to encroach upon the aspen stand. Juniper would continue to encroach upon stands of sagebrush/bitterbrush in the southern portion of the project area and into mountain mahogany stands. The establishment and survival of mountain mahogany regeneration would continue to be difficult with juniper encroachment. Areas with decadent, low vigor shrubs would not be treated and thereby no benefit of new growth or stimulation would occur. There would be No Effect/No Impact to any PETS wildlife species.

Alternative 2 (Proposed Action) and Alternative 3

Direct, Indirect, and Cumulative Effects: Proposed activities May Impact individuals or habitat of the pygmy rabbit and western sage grouse, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species. Activities proposed in areas that may be potential habitat are either dominated by bitterbrush or are mixed stands of bitterbrush and sagebrush. Treatment proposed in potential habitat (Units 1 and 37) would treat encroaching conifers that compete with shrubs and provide cover for predators. Removal of small diameter juniper and vegetative management should improve potential sage grouse habitat by providing a variety of native grasses, forbs, and a better ratio of shrub sizes and ages. Removal of encroaching juniper in mountain mahogany stands will provide better habitat for the establishment and survival of mountain mahogany seedlings. Potential pygmy rabbit habitat may be enhanced with implementation of either alternative. Although there is no occupied habitat, potential sage grouse habitat should improve with the proposed treatments.

Proposed activities would have No Effect to the California wolverine and No Effect/No Impact to any other PETS wildlife species.

ECOLOGICAL INDICATOR SPECIES AND SPECIES OF CONCERN

Existing Condition: The listed wildlife ecological indicator species and those designated as species of concern (SOC) are displayed in **Table 8**. Most meet both categories. Each species potentially represents a community of animals that have specific requirements, many of the requirements overlapping with other species. The following ecological indicators are endemic to the area and could potentially utilize habitats within the planning area. Highlighted species appear to have habitat limitations or habitats are at risk within the planning area:

The primary current limitations to this group are a lack of: snags, down logs, fire created openings, large trees, and open ponderosa pine LOS. Risks to presently suitable habitat include: lack of low intensity, frequent wildfire to maintain open understories and create new snags; increasing stand density which then increases stress among the trees and potentially results in increased insect infestation across large areas; and high intensity fire which could eliminate existing LOS structure and areas with mature shrubs.

The following habitats are discussed beginning on the page indicated. The wildlife species listed with each habitat type are the selected wildlife most likely to be affected by the proposed activities. **Hiding and Thermal Cover (page 24):** mule deer; **Shrubs (Page 26):** green-tailed towhee; **Late and Old Structure (LOS)** and **Old Growth** Management Areas **(OGMA) (Page 28):** white-headed woodpecker, pygmy nuthatch, and white-breasted nuthatch; **Connectivity (Page 29):** mule deer, Northern goshawk, various neotropical migratory birds; **Open Road Density (Page 30):** mule deer; **Snags & CWM (Page 31):** flammulated owl, northern pygmy owl, Lewis' woodpecker, white-headed woodpecker, black-backed woodpecker, Williamson's sapsucker, pygmy nuthatch, white-breasted nuthatch, mountain bluebird, American marten, western small-footed myotis, long-eared myotis, long-legged myotis, pallid bat, and silver-haired bat; **Special Unique Habitats (Page 33):** rock wren, American marten, Townsend's big-eared bat, western small-footed myotis, long-eared myotis, long-legged myotis, pallid bat, fringed myotis, sage thrasher, mule deer, Rocky Mountain elk, gray flycatcher, vesper sparrow, green-tailed towhee, and northern sagebrush lizard; **Raptors (Page 34)**: northern goshawk. Refer to **Table 8** for species status and occurrence within the planning area.

Table 8: Selected Wildlife Species Summary – Aspen Planning Area

Species	Occurrence*	Management Indicator Species	FWS Species of Concern	ODFW Sensitive Species	Ecological Indictor Species and/or Special Habitat Requirements**
Cooper's hawk (NTMB)	S	X			
Northern goshawk (NTMB)	**U**	**X**	**X**	**X**	**X (1)**
Sharp-shinned hawk (NTMB)	S	X			(4)
Red-tailed hawk (NTMB)	C	X			
Golden eagle	U	X			(6)
Flammulated owl (NTMB)	**S**			**X**	**X (1,2, 4, 5-interspersed grassy openings and thickets)**
Northern pygmy- owl	S			X	(2, 7-open forests, edges)
Lewis's woodpecker (NTMB)	**N**	**X**			**X (2-large snags, 7-burns)**
White-headed woodpecker	**U (declining, local extirpations, BBS)**	**X**		**X**	**X (1-PP, 2, 7-sugar pine foraging, large LOS patches)**
Black-backed woodpecker	S	X		X	X (1-LPP, 7-burns)
Williamson's sapsucker (NTMB)	S (declining, BBS)	X		X	X (2-large snags, 7-higher elevations)
Pygmy nuthatch	**U**			**X**	**X (1-PP, 2, 7-large trees)**
Brown creeper	S (declining BBS)				X (1-MC, 7-large trees)
White-breasted nuthatch	**U**				**X (1-PP, 2)**
Gray flycatcher (NTMB)	U				X (3)
Green-tailed towhee (NTMB)	**U**				**X (3)**
Olive-sided flycatcher (NTMB)	**U (declining, BBS)**		**X**	**X**	**X (1, 2, 7 –burns, clearings, edges w/ conifers)**
Hermit thrush	U				X (1-MC, 7-dense, multi-canopy conifers)

Table 8: Selected Wildlife Species Summary – Aspen Planning Area					
Species	**Occurrence***	**Management Indicator Species**	**FWS Species of Concern**	**ODFW Sensitive Species**	**Ecological Indictor Species and/or Special Habitat Requirements****
Golden-crowned kinglet (NTMB)	U (declining BBS)				X (1-MC, 3)
Chipping sparrow (NTMB)	**U (declining, BBS)**				**X (7- open understory w/regenerating pines)**
Sage thrasher	U				X (7-sage and mt. Mahogany)
Mountain bluebird (NTMB)	**C**				**X (2, 7- burns, openings)**
Vesper sparrow (NTMB)	U				X (7-dry meadows, openings)
Rock wren	**U**				**X (7-talus, rock)**
Rocky Mt. Elk	C	X			(7-grass, shrubs winter range)
Mule deer	C	X			(7-shrubs winter range)
American marten	S	X		X	X (1-MC, LPP, 7-CWM concentrations)
Townsend's big-eared bat (Pacific western)	S	X	X	X	(3-foraging, 6-caves)
Western small-footed myotis	S		X	X	(3-foraging, 6, 7-bark of trees)
Long-eared myotis	S		X	X	(6, 7-open forest, bark of trees)
Long-legged myotis	S		X	X	(6, 7-bark of trees)
Fringed myotis	S		X	X	(6)
Pallid bat	S			X	(6, 7-roosts in trees)
Silver-haired bat	S			X	(2-cavities, 7-forages in forest, bark of trees)
Northern sagebrush lizard	S		X		X (3, 6-rock outcrops)

***Occurrence:** **C** = common, **U** = uncommon, **R** = rare, **N** = not expected to occur in the project area, **S** = suspected but not confirmed, i.e. potential habitat available, **Extirpations** = no longer present.

**** Special habitat requirements codes:** **1** = late and old successional forest (LOS), **2** = snags, **3** = mature shrubs, **4** = dense conifers for nesting/foraging, **5** = meadows or grassy openings for foraging, **6** = special/unique habitats (rock, cliffs, caves, etc.), **7** = other, noted. **Abbreviations: LPP** = lodgepole pine, **PP** = ponderosa pine, **MC** = mixed conifer, **NTMB** = neotropical migrant bird, **CWM** = coarse woody materials (logs and limbs > 3" in diameter).

HIDING AND THERMAL COVER

Within the planning area, many areas are incapable of meeting hiding or thermal cover definitions. These areas include xeric (dry habitat) shrublands and areas of low tree productivity where tree regeneration or growth is limited (**Table 9, page 25**). In these areas, cover referred to as "camouflage cover" is important in providing concealment. "Camouflage cover" is comprised of shrubs, coarse woody material, or topography in which big game can blend into the landscape.

HIDING COVER

Existing Condition: Hiding cover is defined as vegetation capable of hiding 90 percent of a standing adult deer or elk from view of a human at a distance equal to or less than 200 feet (Thomas, 1979). Hiding cover provides big game protection from predators and concealment in areas of high open road densities, reducing vulnerability to hunting and poaching. Large, tall shrubs, older pine plantations with trees up to 10 inches diameter at breast height (dbh) and 10 to 15 feet tall, and some multi-storied ponderosa pine stands provide hiding cover. The northern and southern portions of the planning area are relatively devoid of hiding cover with distances between hiding cover stands exceeding what is considered to receive optimum utilization by big game (1,200 feet or less). Opportunities for providing or developing hiding cover in these areas are limited due to 1) lower site productivity, 2) stands are presently fully stocked, and/or 3) regeneration is limited by competition. Some areas that have been harvested and replanted will take several more years before tree-hiding cover is provided.

Alternative 1 (No Action)

Direct and Indirect Effects: In the short-term (less than 15 years), hiding cover would be maintained in the current quantity, quality, and distribution. There would be an increased risk for habitat loss from insect infestations, disease pathogens, and wildfire.

Alternative 2 (Proposed Action) and Alternative 3

Direct and Indirect Effects: Pre-commercial thinning and/or mechanical shrub treatment is expected to reduce the quality and effectiveness within stands with hiding cover, increasing vulnerability of big game to disturbance. Treatments would be expected to eliminate hiding cover in stands currently determined to have marginal to poor quality. Treatments would be expected to reduce hiding cover to marginal quality in stands currently determined to have optimum quality. Hiding cover quality would be reduced in units with proposed underburning treatments, and depending on burn intensity, may be eliminated.

Proposed treatments to shrubs would not affect hiding cover but may substantially reduce "camouflage" cover, increasing the visibility of big game animals in treated openings. Burning under trees are proposed in relatively open stands and focused around the large canopy trees that do not provide hiding cover. Aspen release and juniper removal would have no effect to hiding or "camouflage" cover, as these treatments would remove small, scattered individual trees.

Hiding cover areas were ranked according to their quality (**Table 9**). Determination of quality took into account canopy closure, tree density, field observation, and continuity of cover.

Table 9: Hiding Cover – No Action and Following Proposed Treatment

Quality*	Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
Optimum	545	219	103
Poor	418	117	783
Marginal	1,965	1,239	1,362
Eliminated	0	1,353	680
Total Acres Hiding Cover	2,928	1,575	2,248
Forest Service Ownership	14,705	14,705	14,705
Hiding Cover: Forage Ratio	20:80	10:90	15:85

*** Quality: Optimum** = entire stand exceeded definition criteria; **Poor** = parts of stand met definition criteria; **Marginal** = stand met the definition criteria at its basic level.

THERMAL COVER

Existing Condition: Thermal Cover is defined as cover used by big game to moderate cold weather conditions and to assist in maintaining a constant body temperature (Thomas, 1979). Crown cover greater than 40 percent with trees 30 feet tall is recommended for thermal cover on the Deschutes National Forest. Optimal thermal cover conditions have been compromised somewhat due to low site productivity for tree growth and widespread insect-pest infestations that have killed or severely damaged tree stands. Ideally, hiding and thermal cover stands would be in close proximity to foraging areas and would make up approximately 40 percent of the land area and the optimum distance between cover stands for maximum use by big game is thought to be approximately 1,200 feet (Thomas, 1979).

Within the planning area, thermal cover is provided by ponderosa pine plantations and multi-storied stands. Similar to hiding cover, there are many areas that the distance between thermal cover stands exceeds distances considered as optimum (1,200 feet or less). All but 132 acres of thermal cover are also hiding cover. Overall, the project area is lacking in thermal cover as defined by the LRMP (M7-5) yet is exceeding hiding cover (LRMP, M7, page 4-113).

The definition within the LRMP may not accurately define what is serving as thermal cover within the project area. Because existing thermal cover is below the desired level, it would be difficult for canopy closure to reach and be maintained at 40 percent or higher through time. Areas with a 30 percent canopy closure could provide wind and snow intercept that would increase heat retention and available forage for wintering deer and for this project is the

lower limit for effective thermal cover (Appendix B, Wildlife report, page 8, in the Administrative Record). It is also important to note that some plantation trees and shrubs are tall enough to provide thermal cover but do not meet the thermal cover definition of 30 feet tall with 40 percent crown closure and are not credited in the 40 percent figures in Table 10. Estimates on the amount of thermal cover within the Aspen project area were derived from field inventory, and satellite imagery (ISAT).

Table 10 displays the existing amount (acres) of thermal cover and the percentage of thermal cover to non-thermal cover in the project area. Thermal cover canopy closure would be reduced further below the Forest Plan 40 percent cover closure guideline (M7-13, page 4-114). At 30 percent canopy closure, thermal cover would be above Forest Plan direction (**Mitigations, pages 18**).

Table 10: Thermal Cover – No Action and Following Proposed Treatment						
	Alternative 1 (No Action)		Alternative 2 (Proposed Action)		Alternative 3	
Canopy Closure	**40%**	**30%**	**40%**	**30%**	**40%**	**30%**
Forest Service Ownership - Acres	14,705	14,705	14,705	14,705	14,705	14,705
Thermal Cover - Acres	1,881	6,594	1,122	5,481	1,127	5,711
Thermal Cover Eliminated - Acres	0	0	759	1,113	754	883
Thermal Cover - Percent	13%	45%	8%	37%	8%	39%

Alternative 1 (No Action)
Direct and Indirect Effects: Current quantity, quality, and distribution of thermal cover would be remain nearly constant during the short-term (less than 15 years). There would be an increased risk for habitat loss from insect infestations, disease pathogens, and wildfire.

Alternative 2 (Proposed Action) and Alternative 3
Direct and Indirect Effects: Mechanical shrub treatments, burning under trees, underburning (spring like conditions), juniper removal, and aspen release would have little or no effect on overstory canopy cover and the ability of treated stands to moderate adverse weather conditions. Underburning in the fall (Alternative 2 – Proposed Action) increases the risk of tree mortality immediately prior to high deer use. Some plantations are tall enough to offset weather effects to deer. Noncommercial thinning would reduce or remove the thermal cover value of the stand with a residual stand comprised of small diameter, widely spaced trees. Underburning with springlike conditions would involve some risk to the thermal cover values because of the inherent risk with fire in general.

Treatments would result in a 5 to 8 percent reduction of thermal cover. Under both alternatives the amount of thermal cover would drop below the desired amount.

Cumulative Effects: Either action alternative, in combination with past wildfire, tree harvest activity, and foreseeable activities in adjacent planning areas, reduces the immediate amount and effectiveness of hiding and thermal cover within black bark ponderosa pine stands within mule deer winter range. Long-term (greater than 15 years), through the growth and development of effective cover and forage, improvement of overall habitat within winter range would provide thermal cover and more nutritional forage in close proximity. This would reduce the distance to forage and deer energy expenditure during critical springtime foraging and fawning.

SHRUB HABITATS
Existing Condition: Shrubs, primarily bitterbrush, provide critical mule deer winter forage. They also provide nesting and foraging habitat for shrub-associated species, such as the yellow pine chipmunk and golden mantle ground squirrel, and neotropical migrant birds, such as Brewer's sparrow, sagebrush sparrow, and green-tailed towhee (Paige & Ritter, 1999). Many of these species, particularly the seed- caching rodents, such as the yellow pine chipmunk, serve an important ecological role in the regeneration of shrub species (Vander Wall, 1994).

Eco-types represent groupings of soil and potential vegetation with similar site potentials, expected similar responses to treatments, and reflect similarities in: 1) site carrying capacity, 2) shrub recovery period, 3) expected plant succession following disturbances, and 4) potential for increases of undesirable plant species such as cheatgrass and rabbitbrush. The desired ratio is 1/3 early, 1/3 mid, and 1/3 late seral shrub habitat in each of the major eco-types. **Table 11** displays the acres of shrub by eco-type and describes the characteristics of each.

Table 11: Ecotype*, Plant Association Group, and Potential Productivity			
Eco-type**	**Plant Associations*****	**Acres (% cover) in Planning Area**	**Tree Species Potential Productivity (% cover)**
1 Xeric Shrub	Shrub: Big sagebrush/ bitterbrush/bunchgrass	3,486 (23%)	N/A
2 PP Low	Ponderosa pine/bitterbrush-sagebrush or manzanita/fescue	10,783 (71%)	Ponderosa Pine: 3-30%
3 PP Medium	Ponderosa pine/bitterbrush/fescue	826 (6%)	Ponderosa Pine: 5-60%

***ECO-TYPES** represent groupings of soil and potential vegetation mapping units "ecological units" found in the Natural Resources Conservation Service (NRCS), North Lake County Soil Vegetation Survey.
****Xeric Shrub =** Dry shrubland; **PP Low** = Ponderosa Pine, low productivity; **PP Medium** = Ponderosa Pine moderate productivity (based on plant association and underlying soil types)
*****Plant associations** are defined by Volland, 1988, Plant Associations of the Central Oregon Pumice Zone.

Table 12, page 28, Alternative 1 (No Action), illustrates that, even without comprehensive shrub data on all of the acres within the project area, a majority of the shrubs are in the late seral stages and very few acres of shrubs are in the early seral stages. This would imply that vigorous growth and nutritional quality of deer forage is declining. Currently the desired condition for shrubs is not being met.

Alternative 1 (No Action): Shrub habitats would continue to age, a greater proportion of shrubs moving into late seral. Mature shrubs would increase in abundance. As shrubs become decadent, the nutritional quality would decline. Natural regeneration of bitterbrush would occur that eventually would develop into winter forage. Grasses, and forbs, high in nutritional quality during spring and early summer, would decrease in abundance and diversity with accumulation of litter, maturity of shrub habitats, and lack of disturbance. The risk of wildfire and the associated loss of critical mule deer winter forage would remain high or increase through time. The opportunity to reduce the risk of wildfire in critical mule deer winter range and the opportunity to improve the abundance and distribution of herbaceous forage would not occur.

Alternative 2 (Proposed Action) and Alternative 3
Direct and Indirect Effects: The action alternatives would treat nearly the same acreage and have nearly effects to shrub habitats. Natural fuels treatments in Alternative 2 would convert approximately 1,442 areas to early seral conditions. Alternative 3 would convert approximately 900 acres to early seral conditions. The desired condition is a ratio of 1/3 early seral, 1/3 mid seral, and 1/3 late seral shrub habitat. **Table 12, page 28** displays post treatment shrub seral stage acreages and percentages by eco-type. **Table 13, page 28** summarizes total seral stage acres, post treatment, by alternative. The ratio of early seral shrubs would increase following treatments although substantially under desired ratios because of the necessity to retain shrubs for hiding (camouflage) cover. Underburning would cause mortality to individual shrubs. Bitterbrush can respond with vigorous resprouting, particularly when burning under spring like conditions. Burning under trees would affect areas primarily from the tree stem out to the drip line (outer edge) of the tree crown. The percentage of each acre treated by mechanical shrub treatment would depend on tree density, treating openings between trees.

Treatments would reduce the amount of mule deer winter forage and shrub habitat, including cover, for small mammals and birds. This could benefit predators such as red-tailed hawks, prairie falcons, and marten. Treatments would also result in an increased of production of herbaceous species, grasses and forbs, providing seeds selected by many of the shrub-associated birds and small mammals and high nutritional quality forage for big game during

spring periods. Spring and early summer mechanical shrub treatment and prescribed underburning could result in mortality of small mammals and nesting birds **(Mitigations, page 18)**.

Non-commercial thinning would be expected to have few negative effects to shrub habitat. Neither conifer removal nor juniper removal would be anticipated to have direct negative impacts to shrub habitat, nor to those species that depend upon shrubs. Individual junipers would be removed with large junipers maintained in this habitat. Treatments would improve open shrub habitat for species such as gray flycatcher, green-tailed towhee, and vesper sparrow. The risk of wildfire, and the associated introduction and/or spread of noxious weeds, would be reduced which would maintain shrub habitat for birds and small mammals.

Table 12: Existing Condition and Post Treatment Shrub Seral Stage by Ecotype

Seral Stage*	Eco-type 1: Xeric Shrub 3,486 acres (23%)			Eco-type 2: Ponderosa Pine Low 10,783 acres (71%)			Eco-type 3: Ponderosa Pine Mod 826 acres (5%)		
	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3
Early	0 (0%)	0 (0%)	0 (0%)	100 (1%)	1,174(11%)	649 (6%)	5 (5%)	380(46%)	353(43%)
Mid	64 (2%)	64 (2%)	64 (2%)	2444(23%)	2,087(19%)	2249(21%)	286(35%)	91(11%)	72 (9%)
Late	3025(87%)	3025(87%)	3025(87%)	3077(28%)	2,367(22%)	2730(25%)	440(53%)	260(31%)	306(37%)
YAMD	1(<1%)	1(<1%)	1(<1%)	282 (3%)	275 (3%)	275 (3%)	4(<1%)	4(<1%)	4(<1%)
No Info	396(11%)	396(11%)	396(11%)	4880(45%)	4,880(45%)	4880(45%)	91(11%)	91(11%)	91(11%)

*** Seral Stage: Early =** seedling (shrubs less than 6" tall) and young-adult (> 6" tall and growing vigorously); **Mid =** adult (slowing in vigor, stems >1" at the base), adult-mature, and mature (<30% dead stems); **Late =** mature-decadent and decadent (>30% dead stems); **YAMD =** combination of young, adult, mature, and decadent age classes

Table 13: Seral Stage – Post Treatment Acres and Percent

Seral Stage	Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
Early	105 (01%)	1,554 (10%)	1,002 (07%)
Mid	2,794 (18%)	2,242 (15%)	2,385 (16%)
Late	6,542 (43%)	5,652 (37%)	6,061 (40%)
YAMD	287 (02%)	280 (02%)	280 (02%)
No Information	5,367 (36%)	5,367 (36%)	5,367 (36%)
Total	15,095 (100%)	15,095 (100%)	15,095 (101%)*

* Total percent = 101% due to rounding

Cumulative Effects: Proposed treatments, reasonably foreseeable projects, and past projects would trend toward more early seral conditions over larger acreage. This would achieve a better distribution of big game forage, assuming a more stable level. Proposed treatments would reduce the risk of high intensity wildfire occurring in critical mule deer winter range.

LATE AND OLD STRUCTURE (LOS) AND OLD GROWTH MANAGEMENT AREAS (OGMA)

Existing Condition: Multi-story (Structural Stage 6) and single-story (Structural Stage 7) LOS are below the Historical Range of Variability (HRV). Low amounts of this habitat limit the abundance of LOS associated wildlife species in the area, such as the northern goshawk, flammulated owl, white-headed woodpecker, pygmy nuthatch, white-breasted nuthatch, and brown creeper. **Table 14, page 29** displays the amount of LOS habitat in the planning area by structural stage, tree species, and selected LOS associated wildlife species.

Table 14: Acres of Late and Old Structure Habitat: Structural Stage and Associated Wildlife Species		
Plant Association Group (PAG)	Acres	**Selected LOS Associated Wildlife Species**
Ponderosa Pine Multi-story with Large Trees (SS6)	558	Cooper's Hawk, Northern Goshawk, Flammulated Owl, Great Gray Owl, Sharp-shinned Hawk, Williamson's Sapsucker, Pygmy Nuthatch, Brown Creeper, Hermit Thrush, White-breasted Nuthatch, Golden-crowned Kinglet
Ponderosa Pine Single-story with Large Trees (SS7)	445	Flammulated Owl, Lewis's Woodpecker, White-headed Woodpecker, Pygmy Nuthatch, White-breasted Nuthatch
Total Acres	**1,003**	

Two (2) OGMAs, totaling approximately 880 acres, are within the planning area (**Figure 2, page 5**). These OGMAs contain small portions of smaller trees that do not display old growth characteristics. Representative MIS species are the northern goshawk and white-headed woodpecker. Suitable nesting habitat is not provided for the northern goshawk, although foraging habitat is provided. High quality, large diameter ponderosa pine habitat is not provided for other late seral associated species; such as the white-headed woodpecker, white-breasted nuthatch, or pygmy nuthatch.

Alternative 1 (No Action): LOS forest habitats and OGMAs would continue to age and mature. Earlier structural stage stands would also mature, moving these stands towards LOS habitat. High tree densities in many ponderosa pine stands would retard tree growth, increasing the amount of time to attain large diameter trees and placing stands at risk to insects, disease, and high-intensity wildfire likely resulting in loss of LOS and OGMA habitats. The current levels of connectivity would be maintained without the occurrence of natural disturbances.

Alternative 2 (Proposed Action) and Alternative 3
Direct and Indirect Effects: Springtime burns often have less risk than fall burns of consuming overstory trees because increased fuels moisture content. Spring burning would have less immediate impacts to LOS habitat, including old growth management areas, and has the potential to displace nesting species dependent upon LOS habitat, such as raptors and neotropical migratory birds. Burning under spring like conditions would more closely mimic what may have historically occurred and reduce the risk to nesting species. Other proposed treatments would not be anticipated to adversely affect LOS habitat or dependent wildlife species. Long-term, the proposed actions would help move stands not currently LOS into LOS.

Underburning during spring-like conditions is proposed on approximately 79 acres within the OGMA. Old growth characteristics and stand structure would not change. A reduction in the amount of CWM would be expected from underburning. Treatments would reduce shrub and tree density and the risk of potential loss of these stands to wildfire. Effects would be similar to LOS habitat within the project area.

LOS associated wildlife species that would benefit from treatments include the white-headed woodpecker, pygmy nuthatch, brown creeper, white-breasted nuthatch, western small-footed myotis, long-eared myotis, long-legged myotis, pallid bat, and silver-haired bat (**Table 8, page 23**). Reducing shrub density around large ponderosa pine and noncommercial thinning would be expected to improve white-headed woodpecker habitat, preferring open stands and large diameter ponderosa pine.

Cumulative Effects: There would be an increase in the amount of LOS habitat within the planning area. The abundance of wildlife species associated with LOS habitats would be expected to increase with the development of LOS. Proposed activities would reduce the risk of wildfire spreading from adjacent areas into two (2) OGMAs and associated habitat.

CONNECTIVITY
Existing Condition: Maintaining connectivity between habitats, particularly late and old structured habitat, is believed to be important for numerous wildlife species. Connectivity between late and old structured stands, as

well as allocated OGMAs, allows free movement, interaction of adults, and dispersal of young. A minimum of two connections between late and old structure stands and each OGMA is required, including those outside of the planning area boundary. Connectivity corridors should be those in which: 1) medium to large diameter trees are common; 2) canopy closures are within the top one-third of site potential; and 3) stand widths should be at least 400 feet wide at their narrowest point. If stands meeting this description are not available then the next best stands should be used for connections. The length of corridors between LOS stands and OGMAs should be as short as possible. Connectivity corridors within the project area have been identified. Stands that meet hiding cover definitions, many of the big game travel/movement corridors, are the same as the LOS connectivity corridors since these corridors are the densest available.

Alternative 1 (No Action)
Direct and Indirect Effects: Current connectivity would be maintained without the occurrence of natural disturbances. Travel and movement of big game, Northern goshawk, and neotropical migrant birds would be less effective in the event of wildfire presenting more risk of harassment from human activity.

Alternative 2 (Proposed Action) and Alternative 3
Direct and Indirect Effects: Units 8, 9, 11, 21, 24, 26, 34, 35, and 38-45 contain portions of connectivity corridors. Treatments proposed for these units would not be implemented within the corridors. Exact location of the corridors would be noted on the ground prior to any of the proposed treatments for the rest of the unit. The portions of proposed units located within wildlife corridors that would not be treated would retain big game (hiding cover, thermal cover, and forage), northern goshawk, and neotropical migrant bird habitat.

OPEN ROAD DENSITY
Existing Condition: Open road densities are above the desired Forest Plan Standards and Guidelines in all management allocations. There are approximately 102 miles of system roads within the project area, with an open road density of approximately 4.3 miles of road per square mile. Target open road densities in MA-7, Deer Habitat, are 1.0 to 2.5 miles per square mile. The Forest Plan states, "The target open road density will be used as a threshold requiring a further evaluation, rather than an absolute standard. … The judgment on open road density will be based on the further evaluation rather than the density guideline." (Forest Plan, M7-22, page 4-115). The project area is within the Fox Cooperative Travel Management Area. All roads, with the exception of the 23, 2315, 2315-300, 2325, and 2325-700 are administratively closed from September 25th through October 9th of each year. The closure is to minimize disturbance of big game during hunting season. Access is allowed during the closure, by permit, if approved by the Forest Service or Oregon Department of Fish and Wildlife. A complete list of roads analyzed in the roads analysis has been completed and are listed in **Appendix E, page 87**.

Alternative 1 (No Action)
Direct and Indirect Effects*:* No forest roads would be closed or decommissioned under this EA. Increased vulnerability of big game to hunting and poaching would continue in deer winter range. Intentional or unintentional harassment of mule deer would likely cause expenditure of critical energy reserves during late winter and early spring when forage quality is low and not as abundant. The No Action alternative would forgo opportunities to restrict OHV use occurring on user-created roads and trails, allowing increased disturbance to deer.

Alternative 2 (Proposed Action), and Alternative 3
Direct and Indirect Effects*:* Closing and decommissioning approximately 20 miles of Forest roads would reduce the road density from approximately 4.3 miles of road per square mile to approximately 3.5 miles of road per square mile. The proposed closures would reduce road density toward the Forest Plan target open road density of 1.0 to 2.5 miles of open road per square mile in deer habitat. Physical road closures can benefit/compensate for lack of thermal cover and poor forage conditions. Reducing vehicle access would reduce disturbance and vulnerability of big game, allowing deer to maintain important fat reserves that are critical to winter survival. The Fox Butte cooperative closure would remain in effect during deer hunting season reducing disturbance and vulnerability of

mule deer. Restricting OHV use to open Forest system roads would reduce disturbance to big game and other wildlife species.

***Cumulative Effects**:* Seasonal road closure, and decommissioning and road closure is also proposed in other planning areas within the Deschutes National Forest. The 2002 Devil's Garden – Hole in the Ground Decision Notice provided for closing and decommissioning roads. The proposed Kelsey and Opine planning area activities are proposing to reduce or seasonally restrict access within Deer Habitat. Cumulatively, with the proposal for reducing road densities in Aspen, reducing seasonal harassment of wintering deer would be substantially reduced. The expenditure of energy during the critical foraging and fawning periods during late winter and early spring would be substantially reduced.

SNAG, COARSE WOODY MATERIAL (CWM), AND GREEN TREE REPLACEMENT (GTR)

Existing Condition: Selected wildlife species known or suspected to occur in the planning area utilizing these habitats include the flammulated owl, northern pygmy owl, white-headed woodpecker, black-backed woodpecker, Williamson's sapsucker, pygmy nuthatch, brown creeper, white-breasted nuthatch, mountain bluebird, American marten, western small-footed myotis, long-eared myotis, long-legged myotis, pallid bat, and silver-haired bat.

The DecAID Advisor was used to help determine snag and log levels best suited for each ecotype and associated wildlife species and size and percent of area covered by downed material while also meeting current direction (Eastside Screens). Recommendations were made by assessing each proposed unit as an analysis area and by using the ponderosa pine/Douglas-fir wildlife habitat type. Densities are given in wildlife species tolerance levels at the 30 and 50 percent levels. A 50 percent tolerance level means that 50 percent of a snag or log dependent species will use an area containing these levels.

Table 15 displays the desired numbers of snags, dead trees over 10 inches in dbh and taller than 10 feet. **Table 16, page 32** displays the desired amount of coarse woody material, dead and down material greater than 10 inches DBH at the small end. Based on general field reconnaissance and given these desired levels, the planning area is below or, at best, minimally meeting snag and CWM levels.

Table 15: Desired Snag Density and Size[1]

Delineated Analysis Area (DAU)*	Thomas (1979) Densities[2] (Snags per Acre)		DecAID Densities (Snags per Acre)			Units
	10-19.9" dbh	Greater than 20" dbh	10-19.9" dbh	Greater than 20" dbh	Total	
Ponderosa Pine Dry North and East Aspects Flat to Moderate Slopes Tolerance – 50%						
Open Tree Structure	2.11	0.14	2.8	2.5	5.3	1,7,11,15,17,47
Small/Medium Tree Structure	2.11	0.14	1.6	1.1	2.7	2,3,5,6,8,9,12,14, 16,18-21,23-25, 34-36,48,50
Large Tree Structure	2.11	0.14	2.9	3.6	6.5	26-28, 38-46

[1] *As defined through the DecAID advisor for wildlife habitat type, fire regime, plant association series, topographic position, and tolerance level. Structural series used to further define DAU: Open structure: shrub/seedling – closed canopy; Small/Medium tree structure: 1) sapling/pole – moderate canopy; 2) sapling/pole – closed canopy; and 3) small tree – single story – closed canopy; Large structure: large tree – multi-story – open canopy. The DecAID Advisor is a planning too intended to help specialists manage snag and log levels best suited for their management area and associated wildlife species. The tool uses the best available science and most recent research for species dependent on snags and coarse woody material.

[2] Currently, Eastside Screens directs land mangers to leave 100% of the maximum population potential of species that require snag and/or log habitat relying on Thomas (1979) to determine that amount. Rose et al (2001) introduced DecAID to evaluate a functional target for wood relative to the historic range of natural conditions and current status of dead wood. Refer to the Wildlife specialists report in the Administrative Record for more detailed discussion.

Table 15: Desired Snag Density and Size[1]						
Delineated Analysis Area (DAU)*	**Thomas (1979) Densities[2] (Snags per Acre)**		**DecAID Densities (Snags per Acre)**			**Units**
	10-19.9" dbh	**Greater than 20" dbh**	**10-19.9" dbh**	**Greater than 20" dbh**	**Total**	
Ponderosa Pine Dry South and West Aspects Steeper Slopes Tolerance – 30%						
Open Structure	2.11	0.14	1.4	1.8	3.2	30
Small/Medium Tree Structure	2.11	0.14	0.2	1.1	1.3	4,13,22,29,31-33

DecAID was used in this analysis to help evaluate a functional and ecologically sustainable level of snags over the planning area. With the Thomas (1979) figures found to be low, Table 15, the DecAID tool was also used to help determine a level that still meets the intent of the Forest Plan as amended by the Eastside Screens. Plant series, fire regime, topography, and structural condition were all taken into consideration to arrive at an appropriate tolerance level for which to manage. **Table 15, page 31** indicates that, using the information in DecAID, levels will likely exceed those of Thomas, provide for a variable level across the planning area, and meet the intent of the Forest Plan.

Table 16: Desired Coarse Woody Material (CWM) Density		
Delineated Analysis Area (DAU)	**Coarse Woody Material Percent Cover (Greater than 10" diameter, 20 feet length)**	**Units**
Ponderosa Pine Dry North and East Aspects – Flat to Moderate Slopes Tolerance – 50%		
Open Tree Structure	2%	1,7,11,15,17,47
Small/Medium Tree structure	1.4%	2,3,5,6,8,9,12,14,16,18-21 23-25,34-36,48,50
Large Tree Structure	1.8%	26-28, 38-46
Ponderosa Pine Dry South and West Aspects – Steeper Slopes Tolerance – 30%		
Open Structure	1.2%	30
Small/Medium Tree structure	0.9%	4,13,22,29,31-33

Green tree replacements (GTR) are trees retained, or managed through time, to provide snag or coarse woody material habitat at some point in the future. The objective for treatment units is to provide patches of habitat, or GTRs, in a distribution pattern that is suitable for home range needs of primary cavity excavators. All tree removal activities are required to maintain green tree replacement of greater than 21 inches DBH, or the representative DBH of the overstory layer if less than 21 inches, at 100 percent potential population levels of primary cavity excavators. Green tree replacements do not need to be provided on every acre in the forested ecosystem. A mosaic distribution across the landscape maintaining viable populations and ecological functions is the desired condition.

Alternative 1 (No Action)

Direct and Indirect Effects: Snag, CWM and green tree replacement habitats would be maintained in the current condition. Snag and CWM habitat would remain below desired levels in the ponderosa pine dry PAG during the short-term (less than 15 years). Natural disturbances would recruit snag and CWM habitat, increasing the density of these habitats; particularly in high tree density stands. High tree density in many of the ponderosa pine stands would retard the development of large diameter (greater than 21 inches dbh) trees and future snags.

Alternative 2 (Proposed Action) and Alternative 3

Direct and Indirect Effects: Mechanical shrub treatment (MST) would not affect size or density of snags, CWM or GTRs. MST would reduce the risk of a high intensity wildfire by reducing highly flammable natural fuels. This would provide increased protection and retention of these habitats.

Underburning would reduce highly flammable fuels and small tree density and would likely contribute to greater retention of these habitats over the long-term (greater than 15 years) in the event of wildfire. During the short-term (less 15 years), underburning would likely reduce the amount of existing CWM, either by diameter reduction or overall abundance and, if consumed, could reduce the number of snags. Mortality of larger diameter green trees (greater than 15 inches) may occur as a result of prescribed fire, supplementing snag numbers in the short-term and CWM over the long-term. Underburning during fall periods of low fuels moisture levels (Alternative 2 – Proposed Action) may reduce the current snags and CWM and provide new snags and CWM, a direct result of higher intensity burn. Burning during spring like conditions and mitigation measures (**Mitigations, page 18**) would reduce the loss of snags and CWM.

Burning under trees and noncommercial thinning would decrease the recruitment of snag and CWM habitat by reducing the risk of mortality caused by bark beetles or wildfire, especially small diameter snags. While recruitment of these habitats would slow through density reduction, treatments would contribute to faster tree growth, larger diameter snags, and CWM in the long term.

Precommercial thinning would not have any direct effects to snag, CWM or GTR habitat. Snags or CWM would be unaffected by this treatment and the trees to be felled would be small diameter. The residual stand would be fully stocked with trees that would provide future green tree replacement.

Juniper removal in shrublands and aspen release would have little effect to snags, CWM, or GTR. Removal of scattered small individual juniper would allow the re-establishment of mountain mahogany and continuation of the shrubland community. The removal of small conifer from the aspen stand would remove aspen competition and allow greater growth of the residual aspen and greater sprouting. This would allow the continuation of these unique stands. The size of trees to be removed would be smaller than the sizes of snags and green tree replacements required by the species that use them.

Cumulative Effects: Past activities and natural disturbances reduced large diameter live trees and snags. Replanting areas within the 15,000-acre Aspen Fire area has created areas of dense, small diameter trees at risk to loss from fire. The cumulative proposed activities and any future treatments, within and outside the planning area, would reduce stand densities, other natural fuels, and the risk of a stand replacing high intensity wildfire. Large snags and GTRs and CWM would become available in a shorter time span by reducing densities and other fuels.

SPECIAL UNIQUE HABITATS

Existing Condition: Lava rock outcroppings and flows are scattered throughout the project area, providing unique habitat for a variety of wildlife species. Selected wildlife species known or suspected to utilize these habitats include the rock wren, American marten, Townsend's big-eared bat, pallid bat, western small-footed myotis, long-eared myotis, long-legged myotis, fringed myotis, and northern sagebrush lizard (**Table 8, page 23**).

Mountain mahogany habitat provides high quality mule deer forage and cover, as well as nesting and foraging habitat for birds, including the sage thrasher. Much of the mountain mahogany stands within the planning area are made up of skeletal, low vigor plants.

Aspen is unique and highly valuable providing forage and cover for big game and a variety of birds, and habitat for cavity nesters. Aspen is limited in distribution, abundance, and reproduction from the lack of fire, competition with conifers, and big game and stock browsing.

There are approximately 3,486 acres of xeric shrubland within the planning area, dominated by sagebrush and bitterbrush. Wildlife known or suspected to use these areas include mule deer, Rocky Mountain elk, and neotropical migrant birds including the gray flycatcher, vesper sparrow, and green-tailed towhee.

There are no streams, riparian habitat or wet meadows. One fenced, 1800-gallon wildlife guzzler is located within the planning area. Guzzlers collect precipitation and are designed to provide water for primarily big game, with birds and other wildlife also benefiting.

Alternative 1 (No Action)
Direct and Indirect Effects: Rock outcrop habitats would remain static and mountain mahogany and xeric shrub habitats would continue developing as they presently are. Use by big game, small mammals, birds, and cattle would continue without management changes to habitat. Aspen, competing with conifers, would mature and have smaller diameters. Competition with conifers would result in a gradual decrease in aspen distribution and size without treatment or natural disturbance. The risk of a landscape level high intensity wildfire that could alter these habitats would continue. Management of livestock and the wildlife guzzler would not change.

Alternative 2 (Proposed Action), and Alternative 3
Direct and Indirect Effects: Burning under trees and underburning treatments adjacent to rock outcroppings would result in reductions of primarily shrubs that are used by small mammals and birds. MST and noncommercial thinning may reduce habitat effectiveness for birds and small mammals that utilize small trees and shrubs located away from the immediate border of rock outcrops.

Juniper density would be reduced and would create a seedbed for mahogany regeneration. Mountain mahogany is beneficial to numerous wildlife species including mule deer, elk, sage thrasher, and gray flycatcher. Mountain mahogany provides both cover and forage for big game and nesting habitat for birds. Felling juniper trees may cause minor reductions of potential habitat for species that utilize juniper, particularly birds. This effect is expected to be negligible, as juniper trees to be felled would be small and widely spaced.

With the removal of conifer competition, aspen would be expected to mature, with larger diameter trees providing habitat diversity for a variety of animals, particularly songbirds. The fence line would be repaired and extended to improve and protect aspen regeneration from cattle grazing within the stand.

RAPTORS
Existing Condition: There is one known prairie falcon nest site within the planning area. The nest is located approximately one (1) mile from any proposed unit and was last active in 2002. The nest is not within one-quarter (¼) mile of any units. Species that are known to occur, or that would likely nest within the area, include the northern goshawk, Cooper's hawk, red-tailed hawk, and sharp-shinned hawk.

Surveys of potential goshawk habitat were conducted in 2001-2003. One known nest site was found to be active in 2003. The closest proposed unit under Alternative 3 is located approximately ¾ mile from the goshawk nest site and is proposed for MST and precommercial thinning.

Alternative 1 (No Action),
Direct and Indirect Effects: There would be no immediate change to raptors, habitat, or known nesting sites. Current raptor habitat conditions and trends would be maintained during the short-term (less than 10 to 15 years) and through time. The risk of a high-intensity, stand-replacing wildfire that could eliminate or substantially reduce presently suitable habitat would remain. The risk of other natural disturbances would continue without reductions in forest density and/or natural fuels.

Alternative 2 (Proposed Action) and Alternative 3
Direct and Indirect: No negative direct or indirect effects would occur to raptor species with known nest sites or

which are suspected to nest in the project area. Proposed activities would have no long-term effect to goshawk use of the area. Treatments are not proposed within the nest stand or post-fledging area and would not result in loss of nesting or foraging habitat. Activities conducted during the spring could affect nesting species and have potential for temporary, short-term displacement during project implementation. The closest proposed unit under Alternative 2 (Proposed Action) is located approximately 1.1 miles from the goshawk nest site and is proposed for burning under trees. The closest proposed unit under Alternative 3 is located approximately three-quarters (¾) mile from the goshawk nest site and is proposed for MST and precommercial thinning. Temporary displacement could occur during activities but abandonment of nest sites is unlikely. If nest sites were found within one-quarter (¼) mile of the nest or the 400-acre post-natal foraging area during implementation, effects to habitat would be mitigated (**Mitigation 8, page 18**).

Cumulative Effects: Treatments are not proposed within the nest stand or post-fledging area and would not result in loss of nesting or foraging habitat. Treatments in adjacent planning areas would reduce hazardous fuels and the risk for uncharacteristic high intensity wildfire.

Fire And Fuels

Existing Condition: Approximately 77 percent of the analysis area is considered Fire Regime Group I, incorporating the dry ponderosa pine, which historically had a frequent fire return interval of 8 to 15 years, usually from lightning ignitions. The ponderosa pine stands are predominantly young to middle aged, likely a result of Aspen Flat Fire. Of the 77 percent in this fire regime, 45 percent is forested and 32 percent is grass and shrub lands. The remaining 23 percent of the analysis area is xeric shrub land, which historically had a fire return interval of 10 to 25 years.

Fire suppression during the past 80 to 90 years has allowed naturally occurring fuels to increase above historic conditions within the planning area. Historically, fuel levels were kept low with frequent fire return intervals, allowing fire to burn at lower intensities. Presently, fires frequently burn at higher intensities, killing substantial amounts of vegetation, including large trees (Agee 1993). Many of the large sized, fire tolerant ponderosa pine dominated stands with little ground vegetation has been converted to smaller sized ponderosa pine and heavy bitterbrush stands primarily as a result of timber harvest and the cessation of aboriginal burning. These stands are presently less fire tolerant as a result of increased tree and shrub densities and ground fuel accumulations.

Fire history data indicates that the Aspen Flat Fire of 1959 burned approximately 16,000 acres and covered a substantial portion (65 to 70 percent) of the project area; which explains the abundance of young to middle aged ponderosa stands. During more recent years, 17 fires occurred in the analysis area in a 12-year period from 1988 to 1999 and burned a total of approximately 2.9 acres. Fire Occurrence Rate (0 to 1) is the probability of a fire occurring in a given area per year, referred to in terms of fires per thousand acres per year. Fire occurrence probability for the planning area is relatively low, with approximately 9.4 percent chance of fire occurrence in each 1000 acres of the planning area.

Roads currently allow access to most areas for fire suppression activities. Fuel conditions adjacent to many roads do not provide an adequate defensible space (fuel break/safety corridor) or safe escape route for suppression forces or the public in the event of a high intensity wildfire.

Four (4) of the 13 fire behavior fuel models (Rothermel 1972, Albini 1976) represent the planning area and interpret fire behavior potential. Predominant fuel models are short grasses in open pine stands, dormant shrubs, long-needle litter, and dead-down woody fuels. Fuel models for tall grasses, young or low green shrubs, and compact conifer litter layer with little to no undergrowth are also represented. A very small portion of the planning area is occupied with non-vegetation (cinder and rock). **Table 17, page 36** summarizes current fire behavior potential and acreage.

Table 17: Acreage* Totals for Fire Behavior Potential (Current)	
Fire Behavior Potential	**Acres**
Extreme	1,808
Moderate	10,508
Low	2,774
Non-vegetated	5
Total	**15,095**

***** Acreage calculated in GIS using Landsat data and plant associations. Fire behavior potential based on surface fire potential flame length, rate of spread and fire line intensity using the BEHAVE fire spread model (Andrews 1986).

Particulate matter generated by smoke that measure 10 microns and less in size (PM-10) is small enough to affect human health. During a high intensity wildfire, estimates of smoke emission could range from 240 pounds to 2,000 pounds or more per acre of PM 10s, providing greater potential to negatively affect human health in surrounding communities, Fort Rock, Christmas Valley, and Brothers.

Alternative 1 (No Action)

Direct and Indirect Effects: Existing stands and plantations would remain at high risk to loss from wildfire. No management activities, other than custodial duties such as wildfire suppression, would occur. More acres would accumulate increased surface fuel loadings, including around the base of trees, which would increase fire intensities and rates of spread. Fuels reduction would only occur during wildfires. An increase in fire intensity would likely be lethal to fire tolerant species such as large ponderosa pine and high-density stands with ladder fuels (allow fire to reach crowns). In lodgepole pine communities, a high intensity wildfire would likely be a stand-replacing event.

Improved safety areas for firefighter suppression activities and adequate public/firefighter evacuation routes would not be developed. The effectiveness of aerial delivered retardants into adjacent wildland/urban interface residential developments would be limited due to high fire intensity and long range spotting from airborne embers. The opportunity to expand fuel treatments to provide a more defensible Forest boundary would not occur. Heavy equipment would be required for fireline construction due to fire intensity and limited safe access.

Smoke from wildfires would likely have an adverse impact on surrounding communities. As surface fuels accumulate, smoke emissions from wildfire would continue to substantially degrade air quality with particulates of 10 microns or less.

Alternative 2 (Proposed Action)

Direct and Indirect Effects: Mechanical shrub treatment (mowing, MST), prescribed fire, or a combination of each would occur on approximately 3,635 acres. A return to a low intensity fire regime using prescribed fire would be initiated on approximately 2,250 acres. Approximately 1,395 acres would have MST and/or non-commercial thinning. Proposed thinning and fuels treatments would help fragment continuous ground and tree crown fuels, reducing untreated blocks of fuels. Burning under trees would not reduce the risk of large acreage wildfires due to continuous ground fuels, but would afford some protection for the trees.

Alternative 3

Direct and Indirect Effects: Proposed activities would be similar to Alternative 2 (Proposed Action). Total number of acres proposed for fuels treatment would decrease from approximately 3,635 acres to approximately 3,295 from Alternative 2. Approximately 1,760 acres would have prescribed burning and approximately 1,535 acres would have mechanical shrub treatment (mowing) and/or non-commercial thinning. Vertical and horizontal fuels facilitating development of a relatively benign ground fire into a more destructive crown fire would be reduced.

Effects Common to Alternatives 2 (Proposed Action) and Alternative 3: The risk of a large acreage (greater than 500 acres), high intensity wildfire would be reduced. Fire behavior potential would be reduced to moderate or low within treated units. Under extreme fire behavior conditions, remaining untreated areas, including those areas

proposed for treatment, would burn more intensely with potential spot fires from burning embers. Wildlife objectives in deer winter habitat would be partially met by leaving untreated blocks of shrubs and/or dense tree stands. Depending on shrub and other vegetative growth, wildfire risk reduction treatments could become ineffective in 10 to 20 years.

The effects of prescribed fire with no mechanical treatments (mowing) would include longer flame lengths, increased tree scorch, tree mortality, smoke emissions, and operating costs, fewer opportunities that would allow prescribed burning, and potential fire control problems. Restoration of historic fire regimes are planned to occur every 8 to 15 years. Estimated smoke emissions are compared by treatment and alternative in **Table 18**.

Table 18: Estimated Smoke Emissions from Proposed activities		
Proposed Treatments	**Alternative 2 (Proposed Action)**	**Alternatives 3**
Landing Piles	86 Tons PM10	104 Tons PM10
Underburning	44 Tons PM10	16 Tons PM10
Drip Line Underburning	19 Tons PM10	20 Tons PM10
Total	**149 Tons PM10**	**140 Tons PM10**

Proposed road density reductions (21 miles) would have the potential to increase response time of ground based suppression resources to fire starts. This increase in response time could, under average summer conditions, lead to larger fires.

Cumulative Effects: Past wildfires and tree density reduction management activities, and proposed fuel treatments would limit potential wildfire size to less than 500 acres per occurrence under average conditions. Within the next 5 years, fuels treatments could begin in the Wigtop, Dudley and OB1 planning areas. These planning areas are adjacent to the north and west of the Aspen planning area. Future vegetative and fuels treatments in these areas would further reduce the probability of large fire occurrence within the Aspen planning area. In contrast, further reduction in road densities associated with decommissioning roads will favor large fire growth due to reduced accessibility, increased response times and loss of pre-existing control lines.

Silviculture

SPECIES DIVERSITY

Existing Condition: Plant community classification in the Pacific Northwest Region follows guidelines established in FSH 2090.11 (USDA Forest Service, 1991). Plant association group (**PAG**) mapping is based on the present potential natural communities concept and described without disturbance by natural elements, including fire. A potential natural community (**PNC**) is defined as the biotic community that would be established and maintained over time under present environmental conditions, if succession was completed without additional human-caused disturbances. **Table 19** displays the current vegetative condition by PAG found within the project area.

Table 19: Plant Association Groups (PAG)		
Plant Association Group (PAG)	**Acres**	**Percent of Planning Area**
Dry Ponderosa Pine	11,654	76%
Dry Lodgepole Pine	6	<1%
Xeric Shrublands	3,430	23%
Cinder and Rock	5	<1%
Total	**15,095**	**100%**

Dry Ponderosa Pine: Found throughout the project area. Insect and diseases appear to be generally at endemic levels. Mistletoe is present from zero (0) infection to varying intensities. Records for the project area indicate that

nearly all treatment activities have occurred in the ponderosa pine PAGs. Salvage of larger diameter ponderosa pine, most likely beetle risk trees, has occurred in the past. Salvage harvest and plantation establishment following the Aspen fire of 1959 was extensive throughout the project area.

The majority of ponderosa pine is classified as Structural Stage 1 to 4 (young to middle age). As a result of the Aspen fire and subsequent salvage harvest, few older ponderosa pine stands remain. Structural Stage 5 is multi-stratum (2 or more canopy layers), diversity of trees, and tree diameters generally less than 21 inches diameter at breast height (**dbh** – 4.5 feet above the high point of the ground). Structural Stage 6 is a multi stratum stand with large diameter trees (Greater than 21 inches dbh), two (2) or more canopy layers, and a diversity of trees and trees sizes. There is little natural ponderosa pine regeneration. Less than 3 percent of ponderosa pine is in single stratum with large tree stage (Structural Stage 7). Refer to **Table 20** for details of structural stage.

Dry Lodgepole Pine: Occurs on the north slope of Quarter Butte. This area has been the focus of treatments for the past 20 years including: salvage, seed tree, shelter wood, final removal, non-commercial thinning, and natural or artificial regeneration. Mistletoe is present but not prevalent.

Xeric Shrublands: Composed of bitterbrush, sagebrush and bunchgrasses. There are areas of pure sagebrush, pure bitterbrush and areas with a mix of both. Mt. Mahogany is present, the largest concentration mixed with juniper.

STRUCTURAL STAGE

Photo interpreted data was the base used to determine vegetation structural stages in the planning area. **Table 20** interprets vegetation by structural stage classification within the planning area. All structure stage groups are represented within the project area.

Table 20: Structural Stage Classification

Structural Stage[3]	Acres	Percent of Project Area
SS0: Shrub, Woodland, Meadow, Rock, Open	8,248	55%
SS1: Stand Initiation	952	6%
SS2: Stem Exclusion, Open Canopy	1,842	12%
SS3: Stem Exclusion, Closed Canopy	871	6%
SS4: Understory Re-Initiation	959	6%
SS5: Multi Stratum w/o Large Trees	448	3%
SS6: Multi Stratum w/Large Trees	558	4%
SS7: Single Stratum w/Large Trees	445	3%
SS9: Unclassified Forestland	767	5%
Total Acres and Percent	**15,095**	**100%**

HISTORIC RANGE OF VARIABILITY

The Regional Foresters Amendment # 2, Interim Ecosystem Standard, modifies the Eastside Screens to characterize the landscape patterns of stand structure by biophysical environment and compare this to a Historic Range of Variability (**HRV**). HRV is based on the best determination of conditions in the pre-settlement era and should be developed for large landscapes across which forest types, environmental settings, and disturbance regimes are relatively uniform (Eastside Screens). This project falls under the guidelines of Scenario A of the East Side Screens, where one or both Late and Old Structure (**LOS**) stages (Structural Stages 6 and 7) falls below HRV.

[3] **Structural Stages: Stand initiation** = seedlings/saplings; **Stem exclusion** = Open canopy (closure 25% or less), closed canopy (closure greater than 25%), poles to small logs less than 21" dbh; **Understory re-initiation** = 2 or more canopy layers, poles to small/medium size trees under 21' dbh; **Multi-stratum without large trees** = diverse distributions of trees and tree sizes, large trees over 21" dbh absent; **Multi-stratum with large trees** = over 21" dbh; **Single-stratum with large trees** = over 21" dbh. Structural stage descriptions and definitions can be found in O'Hara et al, (1996) and the Regional Forester's Amendment #2 (1995)

There should be no net loss of LOS from that biophysical environment. HRV is a reference point to be used in the short term to avoid management activities that move conditions away from HRV.

The planning area is below HRV in the ponderosa pine structural stages 6 and 7. In the ponderosa pine biophysical environment, there are only 558 acres of structure stage 6. The composition of the majority of this vegetation consists of small pockets (¼ to 1 acre) of large trees greater than 21 inches dbh that are surrounded by areas of small diameter trees less than 21 inches dbh. The Aspen fire of 1959 burned many LOS stands, reducing the average stand size and structure across the landscape. For all LOS conditions, other components such as snags and coarse woody debris are not reflected in the tables above. Refer to **Table 21** for historical comparisons of HRV.

Table 21: Historic Range of Variability (HRV) - Comparison to Current Conditions

Species Type	Structural Stage	HRV	1920-30's	1946	2003
Lodgepole Pine *	1	0 – 10%	0%	0%	0%
	2 & 3	0 – 20%	1%	0%	0%
	4	0 – 10%	0%	1%	0%
	5	0 – 20%	0%	0%	1% (6 ac)
Total LP			**1%**	**<1%**	**<1% (6 ac)**
Ponderosa Pine	1	0 – 10%	1%	<1%	6% (952 ac)
	2 & 3	0 – 10%	2%	3%	18% (2,713 ac)
	4	0 – 15%	0%	0%	6% (959 ac)
	5	0 – 30%	3%	3%	3% (442 ac)
	6	40 – 65%	64%	51%	4% (558 ac)
	7	15 - 45%	**	14%	3% (445 ac)
	9	N/A	Unknown	Unknown	5% (767 ac)
Total PP			**70%**	**72%**	**45% (6,836 ac)**
Shrub	0	15-35 %	29%	27%	55% (8,243 ac)
Total Shrub			**29%**	**27%**	**55% (8,243 ac)**
Other PVT	-	-	<1%	<1%	-<1%
Total Other			**<1%**	**<1%**	**<1%**
Total		**100%**	**100%**	**100%**	**100%**

* Lodgepole Pine is not classified in structural stages greater than 5, due to definition of large tree > 21" dbh. Structural Stage 5 in lodgepole pine plant groups is considered to be LOS, due to the generally small sizes at physiological maturity. ** Classified as 'mature pine' on the 1920-30's maps, there is some uncertainty on how best to distinguish structure stage 6 from structure stage 7. For this reason, structural stages 6 and 7 are lumped and represent structure stage 6 for this analysis. ***Percentages may not add to 100 % due to rounding.

Table 22 lists the historic disturbance regimes that were thought to be the dominant native disturbances that co-evolved with vegetation in the overall Devils Garden planning area, of which Aspen is a sub-planning area. Disturbance regime assessments across the larger landscape (50,000 to 100,000 acres) are generally more appropriate context than scaling to the smaller project level (15,000 acres). The Aspen fire (1959) appears to have been much larger than expected under the native disturbance regime.

Table 22: Historic Disturbance Regimes - Aspen Planning Area

Biophysical Environment	Dominant Disturbance Factors	Disturbance Regimes (Agee, 1993)*	Average Disturbance Patch Size (Acres)
Non-Forest shrub	Fire	NA	NA
Lodgepole Pine	Fire	Moderate	80 – 150
	Insects and Disease	Moderate	10 – 1,000
Ponderosa Pine	Fire	Low	80 – 150
	Insects and Disease	Low	1 – 20

Disturbance Regimes: Low = 1-25 year return interval, 0-20% tree mortality; **Moderate** = 26 to 100 year return interval, 26-70% tree mortality; **High** = Greater than 100 year return interval, 70% or greater tree mortality.

Approximately 1700 acres of reforestation and 650 acres of harvest have occurred within the past 30 years. The 1959 Aspen fire reduced much of the landscape to stand initiation conditions. Timber harvest activities have been virtually absent from 1980 to present.

Alternative 1 (No Action)

Direct and Indirect Effects: Forest health would continue to decline, as additional stands increased in density, passing into moderate and high-density stress conditions. Existing forest vegetation would remain in a moderate to high-density condition on more than 40 percent of the area. Growth of the larger forest structures (trees) would continue to slow as densities increased in the absence of disturbance events. Small diameter trees, trees generally less than 8 inches dbh, would slowly grow into medium (12 to 21 inches dbh) and large size (greater than 21 inches dbh) trees. Large tree density stress, evidenced by declining crown ratios and growth rates, would increase and lead to additional loss of scarce open park-like ponderosa pine. Natural regeneration of ponderosa pine trees would continue to slowly occupy the area, although it is doubtful that full occupancy to pre-Aspen Flat fire forest coverage would occur without a dramatic change in climate, precipitation or seed dispersal patterns.

The shrub-dominated landscape would continue to exceed the forested landscape within the planning area for the foreseeable future. In the more heavily forested areas, only decadent shrubs would show vigor decline and die. Natural fuels at the base of large ponderosa pine trees would continue to increase. Forest vegetation would become increasingly susceptible to insect infestations and stand replacing fire events, as regular, planned disturbances would be absent. Unplanned disturbance event risk would continue to increase over time as a result of the absence of disturbance.

Alternative 2 (Proposed Action) and Alternative 3

Direct and Indirect Effects: Non-commercial vegetative management activities would occur on approximately 4,290 acres (Alternative 2 (Proposed Action)) and approximately 4,390 acres (Alternative 3) within the project area (**Table 6, page 18**). Forest vegetation would remain in a moderate to high-density condition on less than 30 percent of the planning area (**Table 23, page 41)**. In thinned stands, tree growth would nearly double in diameter, as compared to Alternative 1. Remaining small diameter trees following thinning would more rapidly develop into medium (12 to 21 inches dbh) and large size (Greater than 21 inches dbh) trees. Density stress would decrease in thinned and burned stands and increase in untreated stands. Large tree mortality would slow. Both alternatives would treat approximately 31 acres to increase aspen stocking by reducing ponderosa pine understory stocking. A reduced canopy cover and exposed mineral soil would provide favorable conditions for the germination of seeds. Forest coverage would remain at roughly two-thirds of the landscape into the foreseeable future.

Mechanical shrub treatments and tree thinning would reduce stand densities, but would not change tree structure or species composition. Within the mountain mahogany restoration area, juniper trees would be removed allowing additional site resources to be utilized and likely allowing an increase in mountain mahogany regeneration.

Mechanical shrub treatment and underburning as a thinning mechanism would result in reduced stand densities. Multi-stratum ponderosa pine stands with large trees (SS6) would change to single stratum ponderosa pine stands with large tree structure (SS7). Small size tree clumps would be reduced from multi-stratum to single-stratum, more like historic stand conditions. Tree mortality could increase insect attacks and spread to surrounding large trees damaged or weakened by the prescribed fire treatment. If insects attack the residual, healthy green trees not targeted for thinning by fire, these trees could become weakened with additional potential loss of the large trees in the short and long term.

Burning under trees would reduce the amount of natural fuels under the tree canopy and within tree clumps to reduce the risk of tree loss in the event of a future ground or stand replacing fire. The existing vegetative structural stage for these units is SS6, multi stratum with large trees. Although vegetative structural changes would not be anticipated, densities would be reduced in the small (less than 8 inches dbh) diameter classes. Trees not damaged or weakened significantly would survive insect attack.

Table 23: Stand Density Following Project Implementation *						
Density Category	Alternative 1 (acres)	Alternative 1 (percent)	Alternative 2 (acres)	Alternative 2 (percent)	Alternative 3 (acres)	Alternative 3 (percent)
High Density	2500	17%	1775	12%	1775	12%
Moderate Density	4000	27%	2330	16%	2345	16%
Low Density	8500	57%	10,895	72%	10,880	72%

Cumulative Effects: Based on Forest Plan direction, implementing proposed treatments would allow the continuation of viable tree stocking in proposed treatment units. Proposed management activities would be planned to occur within the next 10 years. No other vegetation or fuels management activities are or have been planned within the planning area. With density reduction activities designed to mimic disturbance agents in adjacent planning areas and the Aspen planning area, vegetative conditions in the highest density stands would be improved. Natural fuels at the base of large ponderosa pine trees would be reduced on a portion of and across the landscape. Risk of disturbance from insect infestations or stand replacing wildfire would decrease and then slowly increase again over time as the benefits of treatment effects decrease. Increases in stand densities and fuels in untreated stands would pose a moderate risk of loss of forested resources. A stand replacing fire would further change the structural stage composition of the area, resulting in loss of most of the scarce existing and future LOS stands and individual trees. Areas currently resembling historic open park-like ponderosa vegetation and having prescribed fire treatments would likely escape a stand replacing disturbance event. Natural regeneration of ponderosa pine trees would continue to slowly occupy the area, although it is doubtful that pre-Aspen Flat fire forest coverage would occur without dramatic changes in climate, precipitation or seed dispersal.

Soils Resource

A qualitative assessment of soil effects was conducted by comparing existing conditions to the anticipated conditions that would result from implementing the action alternatives. The soil resource may be affected within each of the proposed activity areas. An activity area is "the total area of ground impacted activity, and is a feasible unit for sampling and evaluating" (FSM 2520 and Forest Plan, page 4-71). Activity area boundaries are considered to be the smallest identified area where the potential effects would occur. The discussion of soil effects and soil quality standards is focused on the units proposed for mechanical fuel treatments, mechanical shrub treatments, and prescribed underburning.

Existing Condition: The Aspen project area is located east and southeast of Newberry Crater, where landforms, rocks, and soil are products from volcanic events. The landscape is characterized by gentle to uneven lava plains with cinder cones and buttes associated with the Newberry Crater complex. Elevation ranges from approximately 4,770 feet to 5,820 feet on upper ridges of Long Butte. Slopes average 0 to 30 percent over most of the project area, and steeper slope gradients (30 to 70 percent) are associated with escarpments of buttes and lava ridges. Mean annual precipitation varies from about 10 to 16 inches across the landscape, with lower precipitation along the desert fringe. Ash deposits from Mount Mazama (Crater Lake) and Newberry Crater volcanoes have covered most of the planning area, except for a few barren lava flows of minor extent. Mazama ash generally varies from 6 to 20 inches thick and consists mostly of sand size particles that produce sandy-loam soil surface textures. Subsoil layers generally have loam textures, and the underlying bedrock is dominated by basalt and andesite lava.

Dominant soils are moderately deep (20 to 40 inches) to deep (greater than 40 inches) with rapid infiltration rates that drain excess moisture readily over much of the project area. Saturated soil conditions are generally discontinuous and of short duration. The underlying residual soils and bedrock materials have a moderate to high capacity to store water. Surface runoff generally occurs only on localized areas of shallow and moderately deep soils during high intensity storms or when the ground is frozen. There are no perennial streams, seeps or springs within the project area. Existing drainage channels are predominately old ephemeral channels that flow only during high precipitation events.

Sensitive soils within the project area include 1) soils on slopes greater than 30 percent and 2) soils that occur in localized areas of rocky lava flows. There are no potentially wet soils with high water tables. Surface erosion is not a primary concern because all landtypes have either low-to-moderate or moderate erosion hazard ratings. Approximately 22 percent (3,383 acres) of the project area contains landtypes with localized areas of sensitive soils.

There is currently no evidence of severely burned soil[4] from the 1959 Aspen Flat Fire (15,577 acres). The recovery of native vegetation and other sources of ground cover protection have effectively returned surface erosion rates to natural levels. There are no natural or management-related landslides known to exist within the Aspen project area. There is low risk for the proposed actions to cause soil mass wasting because proposed activity areas do not meet criteria for landslide prone terrain.

Over the past 40 years it is expected that natural processes (root penetration, frost heave, rodent activity, freeze-thaw and wetting-drying cycles) have slowly restored soil porosity in compacted areas[5]. The establishment of ground cover and accumulation of organic matter has been improving areas of past soil displacement[6]. It is expected that a deficiency of coarse woody debris exists in some previously managed areas overlapping with proposed activity areas. Areas surrounding dispersed campsites are also usually deficient in down woody debris.

Harvest history for the past 30 years indicates that only about seven (7) acres of past harvest areas overlap with two of the proposed activity areas. Based on soil monitoring for similar harvest treatments and the small extent of overlap with proposed units, it is estimated that two (2) percent of soil in Unit 13 and 10 percent of soil in Unit 25 currently have detrimental soil conditions and are within acceptable Forest Plan standards. These amounts are well within allowable limits set by Forest Plan standards and guidelines and Regional policy (FSM 2520, R-6 Supplement) for maintaining soil productivity. In the early 1970s, intensive site-preparation treatments disturbed soil in portions of 13 proposed activity areas. Based on the Regional definition for detrimental displacement and the extent of overlap with proposed units, it is expected that eight (8) units (2, 9, 11, 15, 17, 23, 24, and 30) continue to have detrimental soil conditions exceeding 20 percent of the unit area. Since the establishment of Forest Plan standards and guidelines, clearing brush with a dozer blade is no longer used as a site preparation practice. Over the past 25 to 30 years, the establishment of native vegetation and the accumulation of litter and organic materials have been improving areas of past soil displacement. These previously managed sites have also accumulated additional coarse woody debris over time. The extent of detrimental soil conditions associated with recreation use and livestock grazing is relatively minor in comparison to existing roads, past logging and mechanical site-preparation disturbances.

Alternative 1 (No Action)

Direct and Indirect Effects: Proposed management activities would not take place. Disturbed soils would continue to recover naturally from the effects of past management. Surface erosion on existing roads and management facilities would gradually decrease as vegetation establishes on disturbed sites. Erosion rates within the project area would not change appreciably unless catastrophic wild land fires occur in dense stands of timber that contain dead and dying trees. In the short-term (5 years), coarse woody debris and surface organic matter would gradually increase or remain the same. In the long-term, fuel accumulations would increase the risk for intense wild land fires and potential adverse effects to soil productivity.

[4] **Severely Burned** = detrimentally disturbed when the mineral soil surface has been significantly changed in color, oxidized to a reddish color, and the next one-half inch blackened from organic matter charring by heat conducted through the top layer.
[5] **Detrimental Compaction** = an increase in soil bulk density of 20 percent, or more, over the undisturbed level in volcanic ash/pumice soils.
[6] **Detrimental Displacement** = removal of 50 percent or more of the A horizon from an area greater than 100 square feet and at least 5 feet in width.

Alternative 2 (Proposed Action) and Alternative 3

Direct and Indirect Effects: Hand-felling trees, including juniper, would not detrimentally disturb the soil. Some thinned trees would remain on the ground to provide surface cover and a source of nutrients as these organic materials gradually decompose. In addition to existing natural fuels, sufficient thinning debris would be retained to provide both short and long-term benefits for maintaining soil productivity. Hand piling and burning small concentrations of these woody materials generally does not result in severely burned soils. Nutrient releases would likely benefit site productivity in these small, localized areas.

Burning machine piled slash and natural fuels would not cause cumulative soil impacts. Burning would occur on previously disturbed sites (facilities such as roads and old skid trails) that have detrimental soil conditions. There would be no additional compaction or soil displacement when specialized machinery is operated on previously disturbed sites (roads, skid trails), over frozen ground, and/or a sufficient amount of compacted snow.

The use of specialized equipment to treat fuel accumulations in random locations of activity areas would be used only where machine piling on existing facilities could not be employed. Equipment would not be used in portions of activity areas that contain sensitive soils with slopes greater than 30 percent. Mitigation measures, including operational guidelines for equipment use, would be enforced to avoid or minimize mechanical impacts to the soil resource. The primary factors that would limit soil compaction are the low ground pressure of the equipment, the limited amount of traffic, and the cushioning effect of surface organic matter. Research has shown that the first few passes over an area compacts the upper few inches of the soil. Additional passes cause greater increases in bulk density and compact the soil to greater depths. The detrimental effects of soil compaction generally require more than 3 to 5 equipment passes (McNabb, Froehlich, 1983). No more than two passes would be allowed on any site-specific area. Frost heaving and freeze-thaw cycles can generally offset soil compaction near the soil surface. Other natural processes that help restore soil porosity in soil surface layers include root penetration, rodent activity, wetting and drying cycles, and the accumulation of organic matter. There would be no cumulative increases in soil compaction because these sites would likely recover in the short-term (less than five (5) years.

Mechanical mulching (chipping) operations would be expected to cause areas (less than 100 square feet) of mineral soil exposure or mixing of litter and soil material, resulting in the loss of 50 percent of the humus enriched topsoil. This would not qualify as detrimental soil displacement. The use of low ground-pressure equipment would not make more than two passes on any site-specific area. Mulching would likely provide short-term benefits to soil productivity by supplying treated sites with nutrients as the fine organic materials gradually decompose within a few years.

Brush mowing activities would not cause detrimental soil displacement and increases in soil bulk density are inconsequential. These activities have been monitored in the past, and results show that increases in soil displacement and compaction are minimal (Soil Monitoring Report, 1997).

Prescribed underburns would be conducted at times and under conditions that maximize benefits while reducing the risk of resource damage. Soil moisture guidelines would minimize the risk for intense ground-level heating. Fuel reductions achieved through planned ignitions usually burn with low-to-moderate intensities that do not cause detrimental changes in soil properties. Low-intensity fire, during moist conditions, does not easily consume material much larger than three (3) inches in diameter, and charring does not substantially interfere with the decomposition or function of coarse woody debris (Graham et al., 1994). The successful implementation of these proposed activities would result in beneficial effects that reduce the potential for future wild land fires and increase nutrient availability over larger areas of ground.

In order to effectively control the spread of fire, approximately three miles of fire line would be constructed around portions of five activity areas (Units 39, 40, 44, 45 and 46). Where dozer line is installed, the blade would be tilted to limit the disturbed width to 36 inches or less, less than the defined criteria of at least 5 feet in width (FSM 2520,

R-6 Supplement), not constituting detrimental soil displacement. The effects of a single dozer pass would not detrimentally compact the soil. Dozer line would not be constructed on sensitive soils or slopes over 30 percent.

Approximately 15.2 miles of system road would be closed, reducing rutting damage and accelerated erosion rates. Approximately 5.2 miles of existing road would be decommissioned, but none of these road segments cross through the proposed activity areas. Soil restoration (subsoiling) on roads, determined as unneeded, would help improve soil quality in portions of the project area located outside of proposed activity units.

Cumulative Effects: The majority of past soil disturbances were in stands outside of proposed units. Most soil disturbances from the 1960s and 1970s have likely recovered through natural processes over time. Frost heaving and freeze thaw cycles have gradually restored soil porosity in compacted layers near the ground surface. The establishment of vegetative ground cover and the accumulation of woody debris and organic litter have also been improving areas of past soil displacement. Some new ground disturbance would occur in random locations of activity areas, but the magnitude of these incidental soil disturbances is not expected to have any measurable long-term effects to soil quality. Mitigation measures are built into the project design to avoid or minimize the area of disturbance and reduce the potential for soil productivity losses. There would be no mechanical disturbance in portions of activity areas that contain sensitive soils with slopes greater than 30 percent. All reasonable Best Management Practices (BMPs) for Fuels Management and Road Systems would be applied to protect soils during prescribed burn operations and to control erosion on existing roads and logging facilities that may be used during project implementation. The action alternatives would reduce fuel densities and the risk for future wild land fires that could potentially cause adverse effects to soil properties. It is expected that sufficient thinning debris and existing natural fuels would be available after treatment to meet recommended guidelines for retention of coarse woody debris. The overall effects of the action alternatives combined with all past, present, and reasonably foreseeable management activities would be within allowable limits set by LRMP standards and guidelines SL-3 and SL-4, and Regional policy (FSM 2520, R-6 Supplement No. 2500-98-1) for maintaining soil productivity.

Road Access

Existing Condition: There are approximately 102 miles of Forest Service classified system roads. The target road density is 1.0 to 2.5 miles per square mile within deer habitat. The current road density is approximately 4.3 miles per square mile. The Forest Plan states, "The target open road density will be used as a threshold requiring a further evaluation, rather than an absolute standard. … The judgment on open road density will be based on the further evaluation rather than the density guideline." (Forest Plan, M7-22, page 4-115). These roads are separated into three categories: primary, secondary and others (**Table 24**). There are also numerous unclassified, user-created roads throughout the planning area that are not tracked on the official transportation inventory.

- Arterial roads: The public is encouraged to use primary roads for access into and through the Forest.
- Collector roads: These routes make a direct single connection to areas outside the reach of the primary system and used by vehicles from high-clearance to passenger cars. Some of these routes may resemble primary routes and function similarly but do not meet primary road criteria.
- Local Roads: All other roads that have minimal risk to safety or environment.

Table 24: Road Classifications, Existing Open Road Miles, and Proposed Road Activities

Classification	Open Road Miles	Closure Miles	Decommission Miles	Post Treatment Open Road Miles
Arterial and Collector	13.0	0	0	13.0
Local	89.0	15.2	5.2	68.6
Total	**102.0**	**15.2**	**5.2**	**81.6**

Most Primary and Secondary roads are in good condition, currently drivable, and in need of brushing, blading, and spot surface improvements. Roads classified as other are becoming overgrown with vegetation. Closed roads (inactivated) remain part of the transportation system, with motorized use eliminated for one or more years. These

roads are stabilized and placed in an inactive status, remaining on the Forest Transportation Inventory, and available for future project use.

User-created roads have evolved from singular non-planned use such as firewood gathering, four-wheel drive recreation, and temporary roads from past resource activities. They are not included under the Forest Development Transportation System.

Alternative 1 (No Action)
Direct and Indirect Effects: Primary roads would continue to receive first priority for maintenance unless safety issues or resource damage are imminent on secondary roads. Although many of these secondary roads are designated "open," diminishing maintenance due to funding priorities would have the same effect as closing the road over time. Some of the roads would deteriorate to a condition where they would not be passable due to windfall, seasonal erosion, and vegetative growth. Although it is not encouraged, users creating new roads or risking passage through hazardous or damaged areas would bypass some of these areas.

Alternative 2 (Proposed Action) and Alternative 3
Direct and Indirect Effects: Road miles would be reduced from approximately 4.3 miles per square mile to approximately 3.5 miles per square mile. Refer to **Table 5, page 16** and **Figure 5, page 17** for proposed road closures. Overall maintenance costs would be reduced. Road closures and decommissioning would decrease access for the recreational public. Although public and forest management access would be altered through the elimination of unneeded or redundant roads, many destinations, such as traditional hunting areas, would continue to be accessible. Access to these areas would continue through non-motorized means.

Recreation Resource

Existing Condition: The planning area is located on the fringe of the high desert and is visited primarily during the spring and fall seasons when the weather is cooler and less dusty than the hot, dry summer months. Use of the area has remained relatively constant for decades. Some increase in recreation use has occurred due to the increase in population and recreation popularity of central Oregon and the Deschutes National Forest but is likely at increasing at a slower rate than use in other parts of the Forest.

Developed Recreation **–** There are no developed recreation sites within the planning area.

Dispersed Recreation **–** Dispersed recreation activities include camping, driving for pleasure, OHV use, firearm use, and forest products collection. There are dispersed campsites within the planning area that receive moderate to no use during the summer season. These are primarily hunting camps that are used during the fall.

Alternative 1 (No Action)
Direct and Indirect Effects: There would be no change to dispersed recreation opportunities. Current dispersed use levels would be expected to increase. Adverse impacts from dispersed use in the form of trampled vegetation, compacted soils, depletion of woody debris, and the development and use of user-created roads would remain likely increase. It is possible that dispersed recreational sites could be eliminated with a high-intensity wildfire. OHV use would likely increase, including use on undesignated or user created roads.

Alternative 2 (Proposed Action) and Alternative 3
Direct and Indirect Effects: Non-motorized recreational use would likely not be affected by the proposed vegetation treatments. Some non-motorized activities would be changed from historical uses as a result in the proposed changes in access through road closures and decommissioning. OHV use would likely increase and would be limited to Forest system roads.

Cumulative Effects: The proposed road closure and decommissioning activities (Roads Analysis, **Appendix E, page 87**) would decrease motorized recreational access, particularly during low precipitation winter months. Road closure activities would alter access and use patterns, continuing to allow adequate road access within the planning area and consistency with the Forest Plan (M7-22, page 4-115). Road closures/decommissioning in other planning areas in addition to these proposals would reduce the overall use of historic recreation sites.

Cultural Resources

Existing Condition: A GIS analysis for previous surveys and sites was completed for the current project. The analysis shows 490 acres, 3 percent, surveyed in 2000. A total of 25 sites were recorded, 24 prehistoric sites ranging in size from small lithic scatters to a very large lithic scatter and one (1) designated administrative site for Aspen Butte Guard Station that was not developed. Four (4) sites have been determined eligible for the National Register of Historic Places (NRHP); 19 sites have not been evaluated and are potentially eligible. No other cultural surveys have been conducted within the planning area.

Approximately 754 acres of the planning area have been identified as high probability zones for cultural sites that have not been surveyed. These zones are located in site-specific areas, such as drainages and rock ridges rather than broad scale areas. Six units (1, 6, 35, 42, 45, 46 (170 acres total)) are located within the zones. Ten cultural sites are located in proposed units, 6, 11, 38, and 46. Three sites are considered eligible for the NRHP and the remaining sites are considered potentially eligible.

Natural disturbances and ground-disturbing management activities have compromised site integrity. Sheep and cattle have grazed the planning area since the early 1880s. The Forest Service created grazing allotments in 1906. Sheep were the major livestock that were grazed on the southern end of the District until the 1960s when cattle replaced much of the sheep herds. Evidence for grazing can still be seen as stock driveways and an occasional metal sign proclaiming that the route is a stock driveway. During the 1930's, railroad logging was used to remove most of the large-diameter ponderosa pine and by 1938 the entire area had been logged.

The very hot 1959 Aspen Flat Fire burned an extensive portion of the planning area. Fire-damaged trees were salvaged logged by clear cutting. Most management-related impacts occurred on and adjacent to heavy-use areas (roads, skid trails, log landings) where surface soils were displaced and/or multiple equipment passes caused major disturbance to the surface. In the early 1970s, dozers cleared vegetation for reforestation activities. Strips were approximately 10 feet wide with 20 feet of untreated area between each strip. Disturbance depth was approximately 6 to 12 inches. Approximately 530 acres of tree seedlings were machine planted using a machine with a V-shaped blade that cleared a space approximately three (3) feet wide. Approximately 430 planting acres overlap 16 proposed treatment units.

Alternative 1 (No Action)

Direct and Indirect Effects: This is the current management alternative. Under this alternative none of the proposed actions would be implemented there would be no impacts to cultural resources. The risk of wildfire would continue, possibly affecting cultural resources by damaging known sites or revealing new sites.

Alternative 2 (Proposed Action) and Alternative 3

Direct and Indirect Effects: The alternatives would be expected to have no effect on cultural resources if mitigation measures are followed (**Mitigations, page 18**). Reduction of stand density by hand felling with a chainsaw and reducing vegetation by mowing or mulching would have little impact. These treatments would create minimal disturbance to the surface and none to subsurface cultural deposits. Hand thinning juniper, removal of conifers within the proposed aspen stand, and the extension of the fence around the aspen stand would have negligible ground disturbance associated with these activities. Alternative 3 proposes four units to be non-commercially thinned by specialized equipment. There are no known sites in these units. The integrity of potential unknown sites has been compromised from past reforestation practices. Cool burns during burning in spring-like

conditions would maintain burn temperatures below critical heat temperature thresholds for damage to cultural resources. Berms and natural materials would close approximately 17.4 miles of road. Subsoiling would decommission approximately four (4) miles of roads. Not all of the acres in proposed units have been surveyed and there is potential for the discovery of unknown sites (Mitigation 37, page 20). The proposed activities are exempt from Section 106 review because they are regarded as having little or no potential to affect cultural properties, as they would occur within existing or already disturbed areas. The construction of two (2) fire lines would potentially disturb unknown sites.

Cumulative Effects: Future activities in adjacent planning areas would reduce vegetation density, likely reducing the overall risk to cultural resources across the landscape from wildfire.

Botany Resource

PROPOSED, ENDANGERED, THREATENED, AND SENSITIVE (PETS) SPECIES

Existing Condition: A total of 2,520 acres of potential plant habitat within the planning area have been surveyed. Surveys have been conducted in proposed units that have potential pumice grapefern (*Botrychium pumicola)*, a federal species of concern, and green-tinged paintbrush (*Castilleja chlorotica)* habitat. Areas were surveyed for American pillwort (*Pilularia americana)*. Surveys have located three Pumice grapefern sites. No paintbrush or pillwort plants have been located. No other PETS plants and habitat have been found within the project area. Refer to **Appendix D, page 74**, Botany Report for the Regional Forester's Sensitive Species List (May 13, 1999) for the Deschutes National Forest.

Alternative 1 (No Action)

Direct and Indirect Effects: Encroaching conifers in Porcupine Flat may eventually change the open habitat of the flat to one where the grapefern could not survive. Should an intense wildfire burn the area, the reduction of shrub cover could allow expansion of grapefern. Habitat and plants could be negatively affected by being exposed to increased access, possible trampling by large animals, and by the accidental introduction of noxious weeds.

Alternatives 2 (Proposed action) and Alternative 3

Direct and Indirect Effects: No effects from Alternative 2 activities would be anticipated for the pumice grapefern. No activities are planned within the populations or their immediately surrounding areas. Two pumice grapefern sites exist in the proposed aspen enhancement unit proposed in Alternative 3. The sites may be directly affected should activities take place in the immediate areas of the sites during the spring or summer. Activities that take place in the fall or winter would be unlikely to affect pumice grapefern during its dormant phase. The two (2) sites comprise less than 0.2 percent of the total known global pumice grapefern population in the planning area. Removing encroaching small conifers from Porcupine Flat may allow the pumice grapefern to continue to exist in that area. The Flat would remain an open area, which is a requirement of the pumice grapefern.

Cumulative Effects: Loss of any plants would unlikely affect either the viability of the plant, or lead to a federal listing.

NOXIOUS WEEDS

Existing Condition: The project area is a part of the Quartz Mountain cattle allotment and is an important area of winter range for large ungulates, deer and elk. Seed and parts may be carried in animals' hooves, on their coats and in their droppings if they have previously grazed in weed infested area. There is one known site of diffuse knapweed (*Centaurea diffusa* Lam) within the project area. The project area has several sites of cheatgrass (*Bromus tectorum),* not considered a noxious weed but is an undesirable non-native species. Most cheatgrass sites are alongside or near roadsides. Several sites are located in unit 18 that is scheduled for aspen release. The project area has one site of horehound (*Marrubium vulgare* L), not a noxious weed but considered an aggressive, undesirable non-native species. Refer to **Appendix D, page 80** for the Deschutes National Forest Noxious Weed List. Noxious weeds on the Deschutes National Forest are most frequently spread via the transportation system.

(Deschutes National Forest Weed Control EA, 1998) Although it is not an area of high recreational use, Off-Highway Vehicle use has increased the risk of noxious weed spread.

Alternative 1 (No Action)
Direct and Indirect Effects: There would be a low-risk for the introduction and spread of noxious weeds without vegetation and fuels treatments. Present populations of noxious weeds would continue to survive, grow, and would likely spread within the immediate area. General vehicle and recreational use may, in the long term, allow noxious weeds to invade the project area. Potential noxious weed spread by vehicles would be limited to the remaining open roads. Cattle or other animals may carry into the area weed seed or parts in their coats or via their digestive systems.

Alternatives 2 (Proposed action) and Alternative 3
Direct and Indirect Effects: Proposed vegetation and fuels activities would provide a high-risk for the spread of noxious weeds in the planning area. The project area may be directly or indirectly affected should weed seeds and/or parts be accidentally introduced on heavy equipment or water hauling equipment. Fire lines that involve exposure of mineral soil, may also allow the invasion of noxious weeds (**Mitigations, page 18**).

Cumulative Effects: General vehicle and recreational use, in conjunction with soil disturbances, may, in the long term, introduce or expand noxious weed populations within the planning area and project areas in particular. Road closures would reduce the overall risk of potential noxious weed spread.

Scenic Resource

Existing Condition: Under the Scenic Management System[7], noticeable deviations to the landscape must blend with the landscape character of the area being viewed over the long-term (5 years and beyond). Decades of fire suppression, other human activities, and wildfires have led to current vegetative conditions that do not meet social expectations of visitors. The area had historically been an open, park-like ponderosa pine forest setting. Filtered views into the foreground and middleground areas of the landscape occur along scattered and random openings along travel corridors. Unthinned and higher density vegetation limit views into the forest. The existing Scenic Integrity Level within the planning area is classified as Low Scenic Integrity (moderately altered), equivalent to the VMS classification Modification.

Alternative 1 (No Action)
Direct and Indirect Effects: The goal of scenic resources in the planning area is to provide visitors with high quality scenery that represents the natural character of the Central Oregon landscape. Under this alternative, the entire acreage of the planning area would not be managed, altered or changed by any management activity with the exception of wildfire suppression and normal routine stewardship activities. Natural disturbance regimes, such as wildfire, insects, and disease, would continue at an accelerated rate, potentially leading to patch sizes larger than what historically occurred. Mountain mahogany would continue to decrease in abundance with the encroachment of juniper. Large, old growth pine, a component representative of the landscape, would diminish. Access and travel management would remain as is. Forest Plan direction and the Desired Future Condition for Scenic Resources would not be met.

Alternative 2 (Proposed Action) and Alternative 3

[7] The Forest Service has adopted a national policy of using the Scenery Management system (SMS) to describe objectives for scenic resources and visual quality. In addition to retaining many of the basic inventory elements of the Visual Management System (VMS), the newer and updated SMS incorporates an understanding of both natural and human processes that have occurred over time. It provides land managers with a tool for integrating human values with ecosystem management. See "Landscape Aesthetics: A Handbook for Scenery Management" (USDA Agriculture Handbook Number 701, December 1995).

Direct and Indirect Effects: Thinning and other vegetation treatments would benefit long-term (5 years and beyond) scenic quality while meeting the Deschutes National Forest's Standards and Guidelines and Desired Future Condition for Scenic Views. The short-term (0-5 years) Scenic Integrity Level would be slightly altered by the proposed management activities.

Large and late and old structure ponderosa pine habitats that are proposed for treatment would be enhanced. The public would benefit from improved aesthetics to areas with traditional uses and considered to have spiritual value. Additional filtered views through the forested landscape would be created. Small diameter juniper removal would likely enhance mountain mahogany quantity and quality, increasing vegetative and scenic diversity. Effects from the proposed activities of Alternative 3 are similar to Alternative 2 (Proposed Action). Proposed activities in Alternative 3 would not have additional effects on scenic quality. The proposed activities are expected to enhance views for both the short- and long-term.

Cummulative Effects: There would be no identifiable cummulative effects.

Range Resource

Existing Condition: The planning area contains portions of the Watkins East and Watkins West Pastures of the Sand Spring Allotment and the Aspen and Power Line Pastures of the Quartz Mountain Allotment **(Table 25)**. The allotments are located primarily within transitional summer/winter range for livestock due to bitterbrush and the lodgepole and ponderosa pine overstory. Records indicate that managed grazing occurred as early as the 1930s and has continued to the present time. Water haul is the only source of water within the portions of the allotments that are in the planning area. Wildfires, such as the 1959 Aspen Flat Fire, temporality increase forage quality and quantity for grazers such as cattle. The next scheduled range analysis is planned to begin in the fall 2003 and will include the Quartz Mountain and Sand Springs allotments.

Table 25: Grazing Allotment Status

Allotment	Total Allotment Acres	Acres Within Planning Area	Permitted Livestock Type	Last Year Actively Grazed/Status
Sand Springs	55, 967	3,848	Cattle	2004/Active
Quartz Mountain	34, 087	11,164	Cattle	2004/Active

Approximately seven (7) percent of Sand Springs and 33 percent of Quartz Mountain allotments fall within the planning area. The current condition of forage species is fair to good. Most of Quartz Mountain allotment is in good condition. Forage quality (grasses and forbs) is decreasing, except where management activities such as tree harvest/thinning, prescribed burning, and brush mowing has occurred. Grazing is permitted from 6/1 to 9/30 in Sand Springs and 6/1 to 10/25 in Quartz Mountain. As trees and shrubs continue to mature, the understory of forbs, grasses and shrubs will be reduced.

Alternative 1 (No Action)

Direct and Indirect Effects: Without the influence of natural disturbance events, such as wildfire, canopy closure would increase and forage species, such as Idaho Fescue and bitterbrush, would decline in availability. Conversion of shrublands to woodlands and the decline of mountain mahogany by the encroachment of western juniper would continue, decreasing potential forage abundance and diversity within those stands. The status of existing roads would not be changed and access for permittees would remain the same.

Alternative 2 (Proposed Action) and Alternative 3

Direct, Indirect, and Cumulative Effects: Prescribed fire, mechanical mowing of shrubs, and tree thinning would benefit livestock grazing by increasing the availability and production of forage. A short-term reduction of bitterbrush could limit seasonal grazing. Livestock utilize bitterbrush depending on factors including season of use, animal preference, and availability of preferred forage. Grazing operations could be adversely impacted if

proposed shrub mowing and/or prescribed burning treatment units need altered pasture rotation or shortened use periods to reestablish shrubs. Successive years or months of treatment and/or multiple types of treatment could extend recovery time for vegetation. The implementation of prescribed fire and hand felling of trees may reduce the density of invasive tree species, such as juniper, and slow the conversion of shrubland communities to forested communities.

Antelope bitterbrush/big sagebrush shrubland and mountain mahogany could benefit from small diameter juniper removal. Most residual material will be left on site. Some suitable fence post material may be removed. Existing vegetation will be reduced by the slash from hand felling operations and vegetation will be reduced. Small changes in the continuity of the shrubland community will occur where these "pockets" of vegetation are impacted. The effect would mimic, on a smaller scale, a mosaic pattern created under normal prescribed burning operations. Some species of plants and animals will benefit from the mosaic pattern. Small mammal populations, including the desert cottontail, increase where the juniper slash remains on the ground (Miller, 2001).

Under Alternative 3, units 3, 6, and 24 would not have mechanical shrub treatments, leaving more shrubs and reducing the area available for livestock utilization. This would reduce the potential for more transitional range that would be created under Alternative 2. The existing forage base in unit 49 would be maintained following conifer removal proposed under Alternative 3. More acres would be treated under Alternative 3 than Alternative 2, having the potential to increase overall forage production in the planning area in the near future.

Proposed road closure would impact permittees by reducing vehicle access into to some areas. This would be offset by the permittees using alternative modes of transportation such as horses. Road closures and the prohibited use of OHVs off of Forest system roads would decrease human/livestock interactions.

Cummulative Effects: There would be no identifiable cummulative effects.

Public Health and Safety

Proposed activities in Alternatives 2 through 6 would improve public health and safety by: 1) the reduction of the risk of entrapment from wildfire; 2) the reduction of the risk of wildfire encroachment onto private and urban lands; and 3) the reduction of the risk of increased airborne particulates with fuels reductions.

No significant adverse effects to public health or safety have been identified. The effects of implementation of the alternatives are well known, not highly controversial, and do not involve any unique or unknown risks. Effects meet or exceed state water and air quality standards.

Public/Commercial Firewood Gathering

The goal of the Deschutes National Forest is to maintain a supply of firewood while protecting other resources. Forest-wide areas for personal use firewood gathering are coordinated among Ranger Districts and designated after the appropriate level of analysis to consider all resources such as wildlife, soil, fuels/fire management, cultural resources and botany. The objective for these areas can serve more than one purpose such as for personal fuel wood and to reduce fuel loadings in a given area. However, the firewood-gathering program does not sufficiently reduce the slash that causes the greater risk of loss from fire. Firewood gathering areas usually require additional cleanup and restoration activities when the firewood gathering areas are closed.

Economics

Table 26, page 51 summarizes the economic effects from each alternative. The main factors that affect these values are: 1) No planned commercial harvest activities would occur; 2) Any material removed from treatment units would be fiber less than 8 inches dbh; 3) An estimate of 2 MBF/acre stewardship conversion for MST, PCT & MST and PCT only units; 4) non-timber values were not included in the efficiency analysis. Non-commercial material is assumed in this analysis, as diameters of trees thinned, burned or mowed are virtually all less than 8

inches in diameter (dbh) and distance to markets precludes commercial operations. There is the potential that a prospective thinning contractor would find use of thinned and decked material that could offset costs of stand treatments. It does not attempt to place a value on the benefits that may occur due to a possible future reduction of road maintenance and fire suppression costs. Amenity values such as dispersed recreation were not included in this analysis.

Table 26: Economic Effects of the Alternatives			
Alternative	1 (No Action)	2 (Proposed Action)	3
Present Net Value @ 4%	0	-$362,842	-$344,141
Benefit/Cost Ratio @ 4%	0	N/A	N/A
Returns to the Federal Government	0	$0	$0
Jobs Supported (9 jobs per MMBF)	0	25	26

Prime Lands

There are no lands within the planning area that are classified as prime farm or rangelands. Proposed activities in Alternatives 2 (Proposed Action) and 3 would not change areas classified as prime forestland. There would be no direct, indirect, or cumulative adverse effect to these resources and thus are in compliance with the Farmland Protection Act and Departmental Regulation 9500-3, "Land Use Policy".

Civil Rights and Environmental Justice

Civil Rights legislation and Executive Order 12898 (Environmental Justice) direct an analysis of the proposed alternatives as they relate to specific subsets of the American population. The subsets of the general population include ethnic minorities, disabled people, and low-income groups. The purpose of the analysis is to determine whether adverse civil rights impacts are anticipated on an underrepresented population. The analysis is to determine also whether disparate or disproportionate impacts associated with the alternatives are anticipated. A primary purpose of the alternatives is to provide for the health and safety of all members of the public by reducing the risk of entrapment from wildfire. Provision of these benefits does not discriminate between subsets of the general population.

Compliance With State and Local Laws

Implementation of Alternative 1 (No Action), Alternative 2 (Proposed Action), or Alternative 3 would be consistent with relevant federal, state and local laws, regulations, and requirements designed for the protection of the environment including the Clean Air and Clean Water Act. None of the alternatives establishes a precedent for future actions or a decision in principle about a future consideration.

Other Effects and Findings

Wetlands, fisheries, water quality and designated floodplains would not be adversely affected by any of the proposed management activities (Appendix E, Soils Report, Administrative Record).

No designated roadless areas, old growth stands, prime farmland, Wild and Scenic Rivers or parkland would be adversely affected by the proposed activities. No significant irreversible or irretrievable commitment of resources would occur under Alternative 2 (Proposed Action) or Alternative 3. There would be some negligible irretrievable losses of fugitive dust caused by mechanical operations. There would be an irretrievable loss of firm wood fiber over the long term under Alternative 1 (No Action), as existing dead lodgepole pine deteriorates in value and is unable to be utilized for commercial firm wood fiber.

Proposed vegetation management activities are consistent with the Record of Decision for the Final Environmental Impact Statement for Managing Competing and Unwanted Vegetation and the subsequent Mediated Agreement of

1989 (Refer to Appendix D of the project files at the Bend-Fort Rock Ranger District office for further information and a discussion of other National Forest Management Act findings).

The alternatives are consistent with the goals, objectives and direction contained in the Deschutes National forest Land and Resource Management Plan and accompanying Final Environmental Impact Statement and Record of Decision dated August 27, 1990 as amended by the Regional Forester's Forest Plan Amendment #2 (6/95) and Inland Native Fish Strategy. The alternatives are in compliance with relevant federal, state, and local laws, regulations, and requirements designed for the protection of the environment. None of the alternatives establishes a precedent for future actions or a decision in principle about a future consideration.

REASONABLY FORESEEABLE FUTURE ACTIONS

Opine Vegetation Management EA: Proposes to implement density and fuels reduction treatments and road closure and decommissioning – 2004.
Cinder Hills Grazing EA: Reauthorized grazing on three (3) grazing allotments totaling approximately 89,210 acres – Signed summer 2004.
Deadlog (2006) and Lady (2007) Vegetation Management EAs.
Flattop (2005), Wigtop (2005), and Cabin (2006) Vegetation Management: Mule Deer Winter Habitat enhancement.

LIST OF PLANNING PARTICIPANTS

This section identifies the Forest Service personnel who participated in the analysis and the preparation of the EA. For a list of organizations and individuals contacted during the scoping process, refer to the project file located at the Bend-Ft. Rock Ranger District.

Interdisciplinary Team

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Gini Stoddard	Geographical Information Systems

Agencies Consulted

Oregon Department of Fish and Wildlife (ODFW)
Bureau of Land Management (BLM)
University of Montana

APPENDIX A

CONSISTENCY WITH THE FOREST PLAN

MANAGEMENT DIRECTION AND RELEVANT FOREST PLAN STANDARDS AND GUIDES

MANAGEMENT DIRECTION

Botany

The Botany Biological Evaluation documents the review and review findings of Forest Service planned programs and activities for possible effects on species (1) listed or proposed for listing by the USDI Fish and Wildlife Service (USFWS) as Endangered or Threatened; (2) designated by the Pacific Northwest Regional Forester as Sensitive. It is prepared in compliance with the requirements of Forest Service Manual (FSM) 2630.3, FSM 2672.4, FSM 10/89 R-6 Supplement 47 2670.44, and the Endangered Species Act (ESA) of 1973 (Subpart B; 402.12, Section 7 Consultation).

Proposed Endangered, Threatened, or Sensitive (PETS) species considered in this evaluation are those listed in FSM 2670.4 R-6 Interim Directive No. 90-1, April 1999, (for plants) as suspected or documented to occur on the Deschutes National Forest (Appendix A).

Forest Service Manual (FSM) direction requires that Noxious Weed Risk Assessments be prepared for all projects involving ground-disturbing activities. For projects that have a moderate to high risk of introducing or spreading noxious weeds, Forest Service policy requires that decision documents must identify noxious weed control measures that will be undertaken during project implementation (FSM 2081.03, 29 November 1995).

This document supports practices that are consistent with direction from the February 3, 1999 Executive Order on Invasive Species (Executive Order #13112). This order requires federal agencies to use relevant programs and authorities to prevent the introduction and spread of invasive species.

Cultural Resources

The management direction for cultural resources is found in the Deschutes National Forest Resource Management Plan, in the Forest Service Manual section 2360, in federal regulations 36CFR64 and 36CFR800, and in various federal laws including the National Historic Preservation Act of 1966 (as amended), the National Environmental Policy Act, and the National Forest Management Act.

Soils

The Deschutes Land and Resource Management Plan (LRMP) specifies that management activitiesare prescribed to promote maintenance or enhancement of soil productivity by leaving a minimum of 80 percent of an activity area, in a condition of acceptable productivity potential following land management activities (Forest Plan page 4-70, SL-1 and SL-3). This is accomplished by following Forest-wide standards and guidelines to ensure that soils are managed to provide sustained yields of managed vegetation without impairment of the productivity of the land. Standard and Guideline (SL-4) directs the use of rehabilitation measures when the cumulative impacts of management activities are expected to cause damage exceeding soil quality standards and guidelines on more than 20 percent of an activity area. Standard and Guideline (SL-5) limits the use of mechanical equipment in sensitive soil areas. Operations will be restricted to existing logging facilities (i.e., skid trails, landings) and roads, whenever feasible.

LRMP Management Areas MA-7, MA-8, and MA-15 do not contain specific standards and guidelines for the soil resource in this area. The Forest-wide standards and guidelines apply to this project proposal.

The Pacific Northwest Region developed soil quality standards and guidelines that limit detrimental soil disturbances associated with management activities (FSM 2520, R-6 Supplement No. 2500-98-1). This Regional guidance supplements LRMP standards and guidelines, which are designed to protect or maintain soil productivity. Detrimental soil impacts are those that meet the criteria described in the Soil Quality Standards listed below.

Detrimental Compaction in volcanic ash/pumice soils is an increase in soil bulk density of 20 percent, or more, over the undisturbed level.

Detrimental Puddling occurs when the depth of ruts or imprints is six inches or more.

Detrimental Displacement is the removal of more than 50 percent of the A horizon from an area greater than 100 square feet, which is at least 5 feet in width.

Severely Burned soils are considered to be detrimentally disturbed when the mineral soil surface has been significantly changed in color, oxidized to a reddish color, and the next one-half inch blackened from organic matter charring by heat conducted through the top layer.

The Regional supplement to the Forest Service Manual (FSM 2520, R-6 Supplement No. 2500-98-1) provides policy for planning and implementing management practices which maintain or improve soil and water quality. This Regional guidance is consistent with LRMP interpretations for standards and guidelines SL-3 and SL-4 that limit the extent of detrimental soil conditions in previously managed areas (Final Forest Plan Interpretation, 1996).

RELEVANT FOREST PLAN STANDARDS AND GUIDES

The relevant Forest Plan standards and guides are listed by resource in **Table 1**. These standards and guides are discussed in the specialists reports and the EA.

Table 1: Relevant Forest Plan Standards and Guides:	
Resource, Forest Plan Standard and Guide, and Page Number	**Description of Standard and Guide**
Cultural	
CR-1, 4-34	Cultural surveys will be conducted according to an inventory plan and research design agreed to by the Forest Service and the Historic Preservation Office (SHPO).
CR-2, 4-34	Cultural resource properties located during inventory will be eval8uated for eligibility to the Register.
CR-3, 4-34	The Forest will develop thematic Register nominations and management plans for various classes of cultural resources.
CR-3, 4-34	Project level inventories or the intent to conduct such shall be documented through environmental analysis for the project.
Wildlife	
WL-48, 4-57	Travel corridors may be provided by linking stands that meet hiding cover definitions.
WL-54, 4-58	Hiding cover is defined as vegetation capable of hiding 90 percent of a standing adult deer or elk from view of a human at a distance equal to or less than 200 feet.
WL-55, 4-58	Cover should be well distributed throughout the area.
WL-56, 4-59	Where needed, travel corridors should be provided by linking stands one-half acre or larger that provide cover.
Deer Habitat	
M7, 4-113	Ideally, cover and forage areas should be in close proximity for optimum use by big game, with cover making up 40 percent of the land area. Approximately three-quarters of cover areas should be thermal cover with the remainder being hiding areas.
M7-5, 4-113	Relatively low site productivity for tree growth, coupled with recent cycles of drought, increase the risk of insect-pest epidemics killing or severely damaging trees-stands valuable for cover.
M7-5, 4-113 and M7-13, 4-114	Crown cover greater than 40 percent with trees 30 feet tall is recommended for thermal cover.
M7-10, 4-114	Areas will provide a mosaic of conditions incorporating hiding, thermal, and travel cover.
M7-14, 4-114	Forage conditions would be maintained or improved with an emphasis on increasing the variety of plants available for forage and a mixture of age classes of shrubs. Variety in areas that are dominated by poor vigor shrubs would be created.
M7-22, 4-115	Deer Habitat target open road densities in MA-7 are 1.0-2.5 miles per square mile.
M7-26, 4-115	The prescribed use of fire will be necessary to maintain diversity within the plant communities. Burning prescriptions will provide for the reestablishment of bitterbrush within 20 years. Approximately 2.0-2.5 percent of this Management Area could be burned annually.
Old Growth	
M15-19, 4-151	Prescribed fire is not appropriate in lodgepole pine stands. In ponderosa pine and mixed conifer stands, prescribed fire may be used to achieve desired old growth characteristics. It may also be used there to reduce unacceptable fuel loadings that potentially could result in high intensity wildfire.
M15-20, 4-151	Prescribed fire is the preferred method of fuel treatment. However, if prescribed fire cannot reduce unacceptable fuel loadings, other methods will be considered.
M15-21, 4-151	Natural fuel loading will normally be the standard.

Table 1: Relevant Forest Plan Standards and Guides:	
Resource, Forest Plan Standard and Guide, and Page Number	**Description of Standard and Guide**
Soils	
SL-1, 4-70	Management activities will be prescribed to promote maintenance or enhancement of soil productivity. The potential for detrimental soil damages will be specifically addressed through project environmental analysis. Alternative management practices will be developed and mitigating measures implemented when activities will result in detrimental soil compaction, puddling, displacement, or soils with severely burned surfaces or those with accelerated erosion.
SL-3, 4-70	Leave a minimum of 80 percent of an activity area in a condition of acceptable productivity potential for trees and other managed vegetation following land management activities. Include all system roads, landings, spur roads, and skid roads or trails to evaluate impacts. Soil monitoring, to include statistical methods, will be required on all sensitive soil areas.
SL-4, 4-70	Any sites where this direction cannot be met will require rehabilitation. Measures may include tillage, smoothing, fertilizing or spreading of biological rich organic materials.
SL-5, 4-70	The use of mechanical equipment in sensitive soil areas will be regulated to protect the soil resource. Operations will be restricted to existing trails and roads whenever feasible.
SL-6, 4-70	In order to minimize soil erosion by water and wind, the following ground cover objectives should be met within the first 2 years after an activity is completed.

APPENDIX B

ALTERNATIVE 2 (PROPOSED ACTION)
And
ALTERNATIVE 3

UNIT SUMMARIES

Alternative 2 (Proposed Action) – Vegetation and Fuels Treatment Summary			
Unit #	**Gross Acres**	**Management Area**	**Treatment Summary[8]**
1	45	Deer Habitat	MST
2	28	Deer Habitat	PCT, MST
3	86	Deer Habitat	PCT, MST
4	50	Deer Habitat	PCT, MST
5	24	Deer Habitat	PCT, MST
6	142	Deer Habitat	PCT, MST
7	18	Deer Habitat	MST
8	66	Deer Habitat	PCT, MST
9	6	Deer Habitat	PCT, MST
11	35	Deer Habitat	MST
12	9	Deer Habitat	PCT, MST
13	15	Deer Habitat	PCT, MST
14	4	Deer Habitat	PCT, MST
15	14	Deer Habitat	MST
16	57	Deer Habitat	PCT, MST
17	21	Deer Habitat	MST
18	31	Deer Habitat	ASPEN RELEASE
19	67	Deer Habitat	PCT, MST
20	23	Deer Habitat	PCT, MST
21	5	Deer Habitat	PCT, MST
22	10	Deer Habitat	PCT, MST
23	8	Deer Habitat	PCT, MST
24	132	Deer Habitat	MST
25	15	Deer Habitat	PCT, MST
26	151	Deer Habitat	UB - SPRING LIKE CONDITIONS
27	37	Deer Habitat	UB - SPRING LIKE CONDITIONS
28	78	Old Growth, Deer Habitat	UB - SPRING LIKE CONDITIONS
29	39	Deer Habitat	PCT, MST
30	53	Deer Habitat	MST
31	25	Deer Habitat	PCT, MST
32	37	Deer Habitat	PCT, MST
33	15	Deer Habitat	PCT, MST
34	25	Deer Habitat	PCT, MST
35	153	Deer Habitat	PCT, MST
36	170	Deer Habitat	PCT, MST
37	612	Deer Habitat	JUNIPER REMOVAL
38	548	Deer Habitat	BURN UNDER TREES
39	81	Deer Habitat	BURN UNDER TREES
40	72	Deer Habitat	BURN UNDER TREES
41	43	Deer Habitat	UB - SPRING LIKE CONDITIONS
42	225	Deer Habitat	UB - SPRING LIKE CONDITIONS
43	291	Deer Habitat	UB - SPRING LIKE CONDITIONS
44	477	Deer Habitat	BURN UNDER TREES
45	134	Deer Habitat	BURN UNDER TREES
46	147	Deer Habitat, General Forest	UB - SPRING LIKE CONDITIONS
Total Acres	**4,323**		

[8] **Treatment Summary: Burn Under trees =** burn under the drip line of the canopies of the trees; **UB (Underburning) =** prescribed burning under a stand of trees; **MST (Mechanical Shrub Treatment) =** Use of mechanized equipment to reduce shrub or ground fuel vertical structure; **PCT =** Non-commercial Thinning; **Aspen Release =** removal of conifers less than 6" dbh; **Juniper Removal =** removal of junipers less than 10" dbh.

Alternative 3 – Vegetation and Fuels Treatment Summary			
Unit #	**Gross Acres**	**Management Area**	**Treatment Summary[9]**
1	45	Deer Habitat	MST
2	28	Deer Habitat	PCT, MST
3	86	Deer Habitat	PCT
4	50	Deer Habitat	PCT, MST
5	24	Deer Habitat	PCT, MST
6	142	Deer Habitat	PCT, MST
7	18	Deer Habitat	MST
8	66	Deer Habitat	PCT, MST
9	6	Deer Habitat	PCT, MST
11	35	Deer Habitat	MST
12	9	Deer Habitat	PCT, MST
13	15	Deer Habitat	PCT, MST
14	4	Deer Habitat	PCT, MST
15	14	Deer Habitat	MST
16	57	Deer Habitat	PCT, MST
17	21	Deer Habitat	MST
18	31	Deer Habitat	ASPEN RELEASE
19	67	Deer Habitat	PCT, MST
20	23	Deer Habitat	PCT, MST
21	5	Deer Habitat	PCT, MST
22	10	Deer Habitat	PCT, MST
23	8	Deer Habitat	PCT, MST
24	132	Deer Habitat	PCT
25	15	Deer Habitat	PCT, MST
26	151	Deer Habitat	BURN UNDER TREES
27	37	Deer Habitat	UB - SPRING LIKE CONDITIONS
28	78	Old Growth, Deer Habitat	UB - SPRING LIKE CONDITIONS
33	15	Deer Habitat	PCT, MST
34	25	Deer Habitat	PCT, MST
35	153	Deer Habitat	PCT, MST
36	170	Deer Habitat	PCT, MST
37	612	Deer Habitat	JUNIPER REMOVAL
38	548	Deer Habitat	BURN UNDER TREES
39	81	Deer Habitat	BURN UNDER TREES
40	72	Deer Habitat	BURN UNDER TREES
42	225	Deer Habitat	UB - SPRING LIKE CONDITIONS
43	291	Deer Habitat	BURN UNDER TREES
45	134	Deer Habitat	BURN UNDER TREES
46	147	Deer Habitat, General Forest	BURN UNDER TREES
47	65	Deer Habitat	MST
48	117	Deer Habitat	PCT
49	551	Deer Habitat	CONIFER REMOVAL
50	12	Deer Habitat	PCT
Total Acres	**4,394**		

[9] **Treatment Summary: Burn Under trees =** burn under the drip line of the canopies of the trees; **UB (Underburning) =** prescribed burning under a stand of trees; **MST (Mechanical Shrub Treatment) =** Use of mechanized equipment to reduce shrub or ground fuel vertical structure; **PCT =** Non-commercial Thinning; **Aspen Release =** removal of conifers less than 6" dbh; **Juniper Removal =** removal of junipers less than 10" dbh; **Conifer Removal =** reduce conifer encroachment.

APPENDIX C

WILDLIFE

BIOLOGICAL EVALUATION (BE) (Page 65)

And

ROAD DENSITY EVALUATION (Page 72)

Biological Evaluation of Threatened, Endangered and Sensitive Wildlife

EXECUTIVE SUMMARY

This biological evaluation (BE) describes and displays the effects to Proposed, Endangered, Threatened, and Sensitive (PETS) fauna species associated with the Devil's Garden – Aspen Subunit project on the Bend/Fort Rock Ranger District.

The pre-field review conducted for this analysis concluded that the pygmy rabbit (*Sylvilagus idahoensis*) and the Western sage grouse (*Centrocercus urophasianus phaios*) have potential habitat within the project area. No other PETS species have been documented or are suspected to occur within or adjacent to the project area.

No negative effects to any PETS wildlife species are expected. Project Design Criteria provided by the year 2001 – 2003 Joint Aquatic and Terrestrial Programmatic Biological Assessment for Federal Lands Administered by the Deschutes and Ochoco National Forests and Prineville District of the Bureau of Land Management for Threatened, Endangered, and Proposed wildlife species are not applicable to this project. The project area lies outside the range of the Northern spotted owl and Northwest Forest Plan (NFP) boundaries. The project area is not within a bald eagle management area (BEMA). It is not within a lynx analysis unit (LAU) or lynx key linkage area (KLA). It does not contain aquatic habitat utilized by the bull trout, mid-Columbia river steelhead trout, or Oregon spotted frog.

Summary of Conclusions

Alternative 1 (No Action) would have **No Effect/No Impact** to any PETS wildlife species.

Alternative 2 (Proposed Action) **May Impact** individuals or habitat of the pygmy rabbit and western sage grouse, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species. Neither of these species has been reported or documented to occur within the project area. The project area is on the periphery of these species range and habitat is marginally suitable. Alternative 2 would have **No Effect** to the California wolverine and **No Effect/No Impact** to any other PETS wildlife species.

Alternative 3 **May Impact** individuals or habitat of the pygmy rabbit and western sage grouse, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species. Alternative 3 would have **No Effect** to the California wolverine and **No Effect/No Impact** to any other PETS wildlife species.

Mitigation

- Retain unburned clumps distributed throughout units. Unburned clumps should be those with coarse woody material (CWM) or snags.
- During prescribed burn operations, avoid direct ignition of CWM material that is greater than 12 inches in diameter and 6 feet in length and snags.
- During mechanical shrub treatment operations, leave an untreated buffer (25 foot radius) around CWM that is greater than 12 inches in diameter and 6 feet in length.

USFWS Contact

No contact with the USFWS was made since the project would not affect any Threatened, Endangered, or Proposed species.

I. INTRODUCTION

This Biological Evaluation documents the review and findings of Forest Service planned programs and activities for possible

effects on species (1) listed or proposed for listing by the USDI Fish and Wildlife Service (USFWS) as Endangered or Threatened; or (2) designated by the Pacific Northwest Regional Forester as Sensitive. It is prepared in compliance with the requirements of Forest Service Manual (FSM) 2630.3, FSM 2670-2671, FSM W.O. Amendment 2600-95-7, and the Endangered Species Act (ESA) of 1973 (Subpart B; 402.12, Section 7 Consultation).

Proposed, Endangered, Threatened, or Sensitive species considered in this evaluation are those listed in R-6 Directive of November, 2000 as suspected or documented to occur on the Deschutes National Forest. Listed animal species and their listing status are in Table 2.

The following analysis addresses the potential effects of the Devil's Garden – Aspen Subunit, hereinafter referred to as the Aspen project on Threatened, Endangered, Proposed and Sensitive animal species. This determination, required by the Interagency Cooperation Regulations (Federal Register: January 4, 1978), ensures compliance with the Endangered Species Act of 1973, P. L. 93-205 (87 Stat.884) as amended.

Project Area Location

The Aspen project is located on lands within Lake County, Oregon. The project area (15,095 acres) is located approximately 25 air miles south of Bend, Oregon. Elevations range from approximately 4980 to 5823 feet. The township and range legal description is: Townships 22 and 23 South, Ranges 15 and 16 East.

The project area lies outside the range of the Northern spotted owl and Northwest Forest Plan (NFP) boundaries. The project area is not within a bald eagle management area (BEMA). It is not within a lynx analysis unit (LAU) or lynx key linkage area (KLA). It does not contain aquatic habitat utilized by the bull trout, mid-Columbia river steelhead trout, or Oregon spotted frog.

Project Description

The Aspen project involves natural fuel reduction treatments, vegetation treatments, and road closures within the Devil's Garden – Aspen project area. The proposed project focuses on providing high quality forage on mule deer winter range, reducing fuels, enhancing resiliency to wildfire and insect outbreak of medium to large size ponderosa pine trees, reducing juniper competition within shrublands, and reducing conifer competition within aspen stands. Project objectives will be met through use of fuel treatments, mechanical shrub treatment (e.g., mowing), and pre-commercial thinning within existing pine plantations.

Alternative 1 – No Action/No Change
With this alternative, the Forest Service would continue to manage the project area under current direction afforded by the Forest Plan. No vegetation treatments, reduction of risk of stand-replacement fire, access (road closures, improvements), or activities to restore natural processes to soil would occur. Conifers would continue to encroach upon the aspen stand, as well as junipers encroaching upon the sagebrush/bitterbrush stands in the southern portion of the project area. Areas with decadent, low vigor shrubs would not be treated and thereby no benefit of new growth or stimulation would occur.

Alternative 2 – Proposed Action
Table 1 displays the proposed vegetative and fuels activities that are common to both Alternatives 2 (Proposed Action) and 3. Proposed treatments would be completed within the 10-year planning cycle. Similarly both alternatives propose to close 11.48 miles of road and decommission another 3.95 miles of road.

Table 1: Proposed Vegetation and Fuels Treatments

Prescription[1]	Units Under Alternative 2	**Acres**	Units Under Alternative 3	**Acres**
MST	1, 7, 11, 15, 17**, 24, 30**	318	1, 11, 7, 15, 17, **47**	198
PCT & MST	2, **3**, 4, 5, 6, 8, 9, 12, 13, 14, 16, 19, 20, 21, 22, 23, 25, **29**, **31, 32**, 33, 34, 35, 36	1,079	2, 4, 5, 6, 8, 9, 12, 13, 14, 16, 19, 20, 21, 22, 23, 25, 33, 34, 35, 36	892
PCT Only	-	0	**3, 24, 48, 50**	347
Aspen Release/Extend Fence	18	31	18	31
Underburn Spring-like Conditions	**26**, 27, 28, 41, 42, **43, 46**	968	27, 28, 42	338

Burn Under Trees	38, 39, 40, **44**, 45	1,282	**26**, 38, 39, 40, **43**, 45, **46**	1,422
Juniper Removal	37	612	37	612
Conifer Removal	-	0	**49**	550
Total Acres Treated		4,290		4,390

[1] **Mechanical Shrub Treatment (MST):** Use of mechanized equipment to mow, cut, chop, grind or otherwise reduce shrub or ground fuel vertical structure. Equipment and attachments would be chosen based on soils (compaction and displacement potential), terrain, other resource concerns, cost and availability; **Thinning (PCT; stand density reduction):** Reduce crown and stem density that would disconnect canopies of trees and reduce ladder fuels that would carry fire from the ground into the forest canopy; **Aspen Release**: removal of conifers that are up to 6" dbh from aspen stand, associated project will be to perform maintenance on the existing fence around the stand and extend it to the road and up the slope approx. 200 feet; **Juniper Removal**: removal of junipers that are less than 10" dbh; **Burn Under trees**: burn under the drip line of the canopies of the trees Objective: Promote or protect late, single-story stand structure, provide pine protection from wildfire, maintain deer forage; **Underburning:** Use of prescribed fire under a stand of trees to decrease or remove accumulated ground fuels; **Machine Piling:** Use of mechanized equipment to gather accumulated fuels into a pile; **Hand Piling:** Use of personnel to gather accumulated fuels to place it in a pile.

Alternative 3

Alternative 3 is similar to Alternative 2 (Proposed Action). However, Alternative 3 adds: 1) the prescription of thinning (PCT) without the accompanying mowing (MST); and 2) the prescription for individual units change (note unit numbers in **bold** in Table 1). The proposed fuels and vegetative treatments for Alternative 2 (Proposed Action) would also be proposed for this alternative. Refer to Table 1 for unit treatment prescriptions. In addition to Alternative 2 the following resource actions would occur with implementation of Alternative 3 there would be removal of conifer encroachment in a sagebrush-dominated area.

II. SUMMARY OF EVALUATION

TABLE 2. Threatened, Endangered, and Sensitive Species

The following threatened, endangered or sensitive animal species are either known to occur or may potentially occur on the Bend-Ft Rock District:

SPECIES	COMMON NAME	FEDERAL CLASSIFICATION
Haliaeetus leucocephalus	Northern bald eagle	T
Strix occidentalis caurina	Northern spotted owl	T
Lynx canadensis	Canada lynx	T
Rana pretiosa	Oregon spotted frog	C
Falco peregrinus anatum	American peregrine falcon	S
Bucephala albeola	Bufflehead	S
Histrionocus histrionicus	Harlequin duck	S, SOC
Podiceps auritus	Horned grebe	S
Podiceps grisegna	Red-necked grebe	S
Numenius americanus	Long-billed curlew	S
Centrocercus urophasianus phaios	Western sage grouse	S, SOC
Coturnicops noveboracensis	Yellow rail	S
Agelaius tricolor	Tricolored blackbird	S
Gulo gulo luteus	California wolverine	S, SOC
Martes pennanti	Pacific fisher	S
Sylvilagus idahoensis	Pygmy rabbit	S, SOC
Key to abbreviations: E=Endangered, T=Threatened, S=USFS Region 6 Sensitive, P=Proposed for Federal listing, C=USFWS Candidate species, SOC=USFWS Species of Concern		

Summary of the Risk Assessment Process

This Biological Evaluation is a 7 - step process to identify Proposed, Endangered, Threatened, and Sensitive wildlife species that may be associated with the ASPEN project area, and to evaluate any impacts the project may have to those species. The seven steps are as follows:

1. A pre-field review of existing documented information.

2. Field clearance and surveys of the project area for evidence of species or habitat.
3. Determination of effects (direct, indirect, and cumulative) the project will have on suspected or known local populations of TE&S species.
4. Analysis of the significance of the projects effects on local and entire populations of TE&S species (determination of irreversible or irretrievable commitment of resources).
5. Determination of conclusions. If stop 4 cannot be completed due to lack of information, a biological investigation is done.*
6. Mitigation/Recommendations
7. Conferencing or informal/formal consultation with USFWS is initiated at appropriate stage as outlined in FSM 2671.45-45c, or is otherwise arranged through formal channels.

*Step #5 pertains only to listed species and will not be shown in the table except when applicable.

The biological evaluation process for wildlife species that may occur within the project area on the Bend-Ft. Rock Ranger District is summarized below. Step #5 (Biological Investigation) was not required for any species, and it is not displayed. The analysis area has been surveyed for potential habitat on aerial photos, and to a large extent, on the ground. **Table 3** displays the steps that were necessary to complete the impact evaluation for each wildlife species considered. Species-specific discussions are included after this table.

TABLE 3. Summary of Biological Evaluation Steps 1-4 and 6.

Species	Step #1 Pre-field Review	Step #2 Field Reconnaissance	Step #3 Determination of Effects	Step #4 Significance	Step #6 USFWS Review
Question to Answer	Habitat Present?	Species Present	Conflict?	Important?	T&E only
Species					
Northern Bald Eagle	N	N	N	N	N
Northern Spotted Owl	N	N	N	N	N
American peregrine falcon	N	N	N	N	
Bufflehead	N	N	N	N	
Harlequin duck	N	N	N	N	
Horned grebe	N	N	N	N	
Red-necked grebe	N	N	N	N	
Long-billed Curlew	N	N	N	N	
Yellow rail	N	N	N	N	
Tricolored blackbird	N	N	N	N	
Greater Sandhill Crane	N	N	N	N	
Western Sage Grouse	Y	Unknown	N	N	
Canada Lynx	N	N	N	N	N
California Wolverine	N	Y – close proximity to project area.	N	N	
Pacific fisher	N	N	N	N	
Pygmy rabbit	Y	Unknown	N	N	
Oregon Spotted Frog	N	N	N	N	

N = No; Y = Yes

III. AFFECTED WILDLIFE

Pre-field review summary and field survey results

The pre-field review concluded that potential habitat of the pygmy rabbit and western sage grouse is found in the shrub-dominated stands scattered throughout the project area; specifically in Units 1, 37, and 49. Potential habitat for both species is thought to be marginal being as this habitat consists of mixed stands of bitterbrush and sagebrush and isolated from one another

by stands with a ponderosa pine overstory. In addition to the low habitat quality, the project area is on the periphery of these species range. As one moves off of National Forest Land there are larger areas of more suitable habitat. There have been no reports or documentation of either species within the project area.
A sighting of two wolverines was reported in the year 2000 approximately 5-6 miles to the north of the project area. There have been no reported or documented sightings of the wolverine within the project area.

No other PETS species or their habitat are known or suspected to occur within, or adjacent to the project area.

Determination of Effects

Alternative 1 (No Action) -- Direct, Indirect, and Cumulative Effects

The no action alternative would maintain current habitat conditions. No direct, indirect, or cumulative effects to any PETS wildlife species would occur.

Alternative 2 (Proposed Action) -- Direct, Indirect, and Cumulative Effects

The Proposed Action is expected to have **No Impact** to the California wolverine. The proposed activities would not have any direct or indirect effects on individuals or natural habitat of the wolverine, nor would there be negative effects to prey species. The wide-ranging habits of this animal would allow it to avoid disturbance caused by this project. No cumulative effects to the wolverine would occur.

The Proposed Action **May Impact** individuals or habitat of the pygmy rabbit but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species. The pygmy rabbit is a sagebrush obligate. Pygmy rabbits are very selective of plant associations. They typically occur only in areas dominated by tall, dense stands of Great Basin or big sagebrush and rarely occur where sagebrush is a minor component or lacking from the plant community (Johnson and O'Neil 2001). Activities proposed in the Aspen project, and more specifically in areas that may be potential habitat, are either dominated by bitterbrush or are mixed stands of bitterbrush and sagebrush so the probability of negatively impacting the pygmy rabbit is thought to be low. Conversely, the treatment proposed in the potential habitat (Units 1 and 37) addresses some habitat degradation by treating the encroaching conifers that compete with the shrubs and provide cover for predators. Thus, there may be some small benefit of this alternative.

The Proposed Action **May Impact** individuals or habitat of the western sage grouse but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species. The project area is on the periphery of this species range and habitat is marginally suitable. Western sage grouse are closely associated with sagebrush dominated lands. Treatment areas providing potential habitat (Units 1 and 37) are largely comprised of mixed stands of bitterbrush and sagebrush. There have been no reports or documentation of sage grouse within the project area. The nearest known occurrence of sage grouse is over 12 air miles from the project area.

Applicable criteria from the Project Design Criteria for occupied sage grouse habitat from the 2003-2006 Programmatic BA states there should be no prescribed burning in occupied habitat, treatment of juniper (encroachment) with mechanical means, and vegetative management should benefit sage grouse by including a variety of native grasses, forbs, and sagebrush sizes. This alternative fits within these criteria. Although there is no occupied habitat, sage grouse habitat should improve with the proposed treatments.

The Proposed Action would have **No Effect/No Impact** to any other PETS wildlife species.

Alternative 3 – Direct, Indirect, and Cumulative Effects

The effects of alternative 3 are expected to be the same as alternative 2 (Proposed Action). Alternative 3 would have **No Impact** to the wolverine, **May Impact** individuals or habitat of the pygmy rabbit and western sage grouse but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species, and have **No Effect/No Impact** to any other PETS wildlife species. Refer to the rationale provided in alternative 2.

This Alternative does have the added Unit 49, which would be considered potential habitat for the pygmy rabbit and western sage grouse. The habitat, though classified as sagebrush dominated, would be considered marginal because it is a narrow stretch of sagebrush surrounded by pine stands. The proposed treatment for this unit is to remove the encroaching conifers; therefore the rationale of the impact determination remains the same as in the discussion for Alternative 2.

Conclusions

The action alternatives (Proposed Action and Alternative 3) **May Impact** individuals or habitat of the pygmy rabbit and western sage grouse but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species. They would have **No Effect/No Impact** to any other PETS wildlife species.

Mitigation

- Retain unburned tree and shrub clumps distributed throughout units. Unburned clumps should be those with CWM or snags.
- During prescribed burn operations, avoid direct ignition of CWM material that is greater than 12 inches in diameter and 6 feet in length and snags.
- During mechanical shrub treatment operations, leave an untreated buffer (25 foot radius) around CWM that is greater than 12 inches in diameter and 6 feet in length.

Recommended Action

Proceed as planned including the described mitigation measures.

References

Deschutes National Forest Land and Resource Management Plan. August 1990.

Deschutes National Forest Noxious Weed Control Environmental Assessment. September 1998.

Joint Aquatic and Terrestrial Programmatic BIOLOGICAL ASSESSMENT For Federal lands within the Deschutes Basin Administered by the Bureau of Land Management Prineville Office and for Federal Lands Administered by the Deschutes and Ochoco National Forests. April 30, 2001.

Johnson, David H. and T. A. O'Neil. 2001. Wildlife-Habitat Relationships in Oregon and Washington. Oregon State University Press. Corvallis, OR.

Marshall, David B., M. Chilcote, and H. Weeks. June 1992. Sensitive Vertebrates of Oregon. June 1992. Oregon Department of Fish and Wildlife.

U.S. Department of the Interior. Bureau of Land Management. November 1994. Sage Grouse in the High Desert of Central Oregon – Results of a Study, 1988- 1993.

Wildlife Road Density Evaluation Within The Aspen Project Area's Deer Habitat (MA-7) Allocation

This appendix updates the Aspen wildlife report. According to the original wildlife report (September, 2003 by Barbara Webb, Wildlife Biologist), the Aspen project area is predominantly the MA-7 allocation. Road densities at the time were calculated at being approximately 3.4 miles per square mile. The desired open density, according to standard and guideline M7-22, is 1.0-2.5 miles per square mile. As was originally reported, the project exceeds this desired density but after proposed road closures and decommissioning the density would approximate the upper end of the desired density (i.e. 2.5 mile per square mile).

The road density figures were revisited in February 2005. Recalculations revealed that the original figures were incorrect and the existing density is approximately 4.3 miles per square mile; after the proposed closures and decommissioning it would be approximately 3.5 miles per square mile. With these new figures, it is apparent that the road density would still exceed the standard and guideline after project implementation. The Deschutes LRMP states that in these cases a further evaluation by the biologist is required to determine the extent of the effects of this excessive road density, ultimately determining if a forest plan amendment would be necessary.

In reviewing this new information, the effects of the open road density must be considered. First, open road density affects wintering deer through harassment. Use of the roads by motorized vehicles can cause an animal to flee and use up needed energy reserves to survive the winter. Secondly, open roads allow easier access for hunters (and in some cases poachers) thereby having a direct effect on the mortality of deer. Some environmental features that aid in protecting the animals from these two effects are hiding and thermal cover. There are also actions that can be taken to reduce these effects, for example, retention patches of cover within treated areas, and road closures and decommissioning.

In the project area, and specifically as a result of the action alternatives, the levels of hiding cover would decrease but remain above LRMP levels. There would also remain areas of camouflage cover (tall shrubs that can hide an adult animal). Mitigation measures to establish retention patches were also described that would help offset the loss of cover. There is also a cooperative road closure (i.e. green dot) system within the project area. The Fox Butte closure significantly reduces the open road density during the deer hunting season (September 25th – October 9th each year), addressing the direct mortality effects of hunters using open roads.

Thermal cover is also reduced as a result of the action alternatives. Mitigation measures (retention patches) are described that will help offset some of the effects of low thermal cover. The wildlife report, however, also describes some of the limitations of the way the LRMP defined thermal cover and the conditions within this specific project area (page 8). In summary, within the project area there are stands that do not meet the 30-foot definition of cover, yet are tall enough to provide some thermal benefits to deer. It is also important to note that the Aspen project area is within some of the most remote areas of the Bend-Fort Rock Ranger District (25 air miles from Bend, considerably more by road with few to no amenities: paved surfaces, sno-parks, campgrounds). If one also considers road conditions in the winter (snow and mud), it can be assumed that this area gets very little vehicle traffic in the winter. These factors help to minimize the likelihood of negative effects to wintering deer.

In summary, although the road density in the Aspen project area is above the LRMP a desired level, there are area-specific conditions that minimize the negative effects from these roads. Most notably are 1) The Fox Butte closure that minimizes the risk of deer falling prey to hunters; 2) many opportunities for thermal and hiding cover are present but do not meet LRMP definitions; and 3) the remoteness of the project area limits the amount of vehicle traffic. The action alternatives also propose road closures and decommissioning that move the project area road density towards the desired level and mitigation measures. Based on these factors, it is my conclusion that the net effect of the project is compatible with the LRMP and will enhance conformance of the area with wildlife objectives. An LRMP amendment is not necessary.

Barbara S. Webb
Wildlife Biologist
March 4, 2005

APPENDIX D

BOTANY

BIOLOGICAL EVALUATION (BE) (Page 74)
AND
NOXIOUS WEED ASSESSMENT (Page 80)

BIOLOGICAL EVALUATION

THREATENED, ENDANGERED, AND SENSITIVE PLANTS

ASPEN PROJECT

INTRODUCTION
This Biological Evaluation documents the review and review findings of Forest Service planned programs and activities for possible effects on species (1) listed or proposed for listing by the USDI Fish and Wildlife Service (USFWS) as Endangered or Threatened; (2) designated by the Pacific Northwest Regional Forester as Sensitive. It is prepared in compliance with the requirements of Forest Service Manual (FSM) 2630.3, FSM 2672.4, FSM 10/89 R-6 Supplement 47 2670.44, and the Endangered Species Act (ESA) of 1973 (Subpart B; 402.12, Section 7 Consultation).

Proposed Endangered, Threatened, or Sensitive (PETS) species considered in this evaluation are those listed in FSM 2670.4 R-6 Interim Directive No. 90-1, April 1999, (for plants) as suspected or documented to occur on the Deschutes National Forest (Appendix A).

The following analysis addresses the potential effects of the proposed Aspen Project on PETS plant species of all alternatives.

SUMMARY OF FINDINGS
An analysis of effects on species viability found the following:

The Aspen Project will not affect the viability of the *Botrychium pumicola* populations,

There will be no effect on any other Proposed, Endangered, Threatened, or Sensitive Plant Species or habitat within the project because none are known to exist there.

This document is organized as follows:

1. PROJECT DESCRIPTION--Description of the project and its alternatives;

2. EVALUATION--Evaluation of effects on listed plant species;

3. COMMUNICATION--Communication with personnel during the evaluation;

4. REFERENCES--Documents referred to during the evaluation;

5. APPENDICES--Appendices of listed species which are suspected to occur on Deschutes National Forest and within the project.

PROJECT DESCRIPTION

The Aspen project is located about 25 air miles southeast of Bend, Oregon in Township 22 South, Range 16 East and Township 23 South, Ranges 15 and 16 East. It comprises approximately 15,095 acres and includes 350 acres of other ownership. The project has been designed to improve deer winter range, reduce fuel levels to reduce the risk of high-intensity fires, close some roads to reduce open road density to 2.5 miles or less per square mile, and manage OHV use within the project area.

ALTERNATIVE ACTIONS

Alternative 1 - No Action Alternative

Under this alternative, no action would take place. There would be no vegetation management, no vegetation improvement or restoration, no fuel reduction projects, no road closures, and no management of Off-Highway Vehicles.

Alternative 2 – Proposed Action Alternative

Alternative 2 is the project as described above. 4,323 acres are proposed for treatment. Vegetation management for the project would include mowing shrubs in 7 units (318 acres) and a combination of thinning trees and mowing shrubs in 24 units (1,079 acres). Spring or fall underburning to reduce fuels would take place in 7 units (972 acres) and burning under the drip-line of the trees' canopies would take place in 5 units (1,311 acres). One unit of 612 acres would have all encroaching junipers removed to improve habitat for wildlife. Treatment to improve an aspen stand is planned for a 31 acre unit in Aspen Flat. 11.48 miles of roads would be closed and 3.95 miles of road would be decomissioned.

Alternative 3
Alternative 3 is similar to Alternative 2 with the following changes –
Units 24, 30, 29, 31, 32, 44, and 41 are to be dropped.
Units 3, 6, 24, 48 and 50 would be thinned, but there would be nomechanized shrub treatment. Units 27, 28 and 42 would be burned under spring-like conditions and units 26, 43 and 46 would be included in the "Burn under trees" treatment. Unit 49 would be included as a unit for small conifer removal. Trees will be hand cut, dropped and left on site.

EVALUATION

This evaluation of the project area includes:

_X_ A pre-field review.
_X_ A field survey (if probable habitats were identified).
_X_ Project effects.
_X_ Management recommendations.

PREFIELD REVIEW - METHODS AND RESULTS

Project Area Description: The project encompasses 15,095 acres with elevations ranging from 5,000 to 5,823 feet. Slopes are varied throughout the area and range from flat to steep. Soils are sandy to loamy over glacial outwash and lake deposits, or loamy to sandy pumice over hard basalts, andesites, and rhyolites. Cinder cones in the area have sandy loam to sandy pumice soils. Plant associations are ponderosa pine/bitterbrush/Idaho fescue, ponderosa pine/sagebrush/Idaho fescue, juniper/sagebrush/fescue and sagebrush/ fescue. Habitats are ponderosa pine forests, open sagebrush flats with some areas of juniper, old timber sale units, and roadsides. Three small ponds/water holes within the project area are thought to be either man-made or man-adjusted. They have very little riparian vegetation. Annual rainfall is approximately 15 to 20 inches.

Prefield Reviews revealed that the following PETS plant species may occur within the project area:

Species	**Probability of Occurrence**
Botrychium pumicola	High (Known to exist within the project)
Castilleja chlorotica	Low
Pilularia americana	Low

Field surveys in potential habitat were recommended.

Name of Project	**Year Surveyed**	**Acres**
Ko	**1990, 1991**	**248**
Fuels 97	**1997**	**535**
Devils Garden	**1998**	**723**
East Boundary	**1998**	**1014**
Aspen	**2002**	**10 (approximately)**
Total Acres		**2530**

FIELD RECONNAISANCE

A meander clearance survey* was conducted in units with potential habitat for *Botrychium pumicola* and *Castilleja chlorotica* from June 2 – August 26 1998 as part of the Devils Garden and East Boundary Projects. Other units within the project area

were surveyed in 1990 and 1991 for the Ko timber sale and in 1997 for the Fuels Project. Two water holes in Watkins Flat were surveyed 30 May 2002 for *Pilularia americana*. A total of 2,520 acres of potential plant habitat have been surveyed. *During a meander clearance survey, the surveyor is allowed discretion to meander randomly through an area, while ensuring that all sectors, all differing plant habitats, all differing plant associations, substrates, aspects, and slopes and any unusual habitats within the area are visited.

***Botrychium pumicola* (pumice grapefern), a federal species of concern, was already known to exist at one site within the project area before any plant surveys were conducted. 1998 surveys located two more sites.**

No *Castilleja chlorotica* or *Pilularia americana* plants were located.

***Centaurea diffusa* Lam (diffuse knapweed), a noxious weed was located during 2002 surveys for noxious weeds.** (See Noxious Weed Risk Assessment for more information)

***Bromus tectorum* L. (cheatgrass), a non-native plant species was located at several roadside locations during 2002 surveys for noxious weeds.** (See Noxious Weed Risk Assessment for more information)

***Marrubium vulgare* L. (horehound) a non-native plant species is known to grow at a site on Road 830 within the project area.** (See Noxious Weed Risk Assessment for more information)

Results of these surveys are on file at the Bend/Fort Rock Ranger District office.

PROJECT EFFECTS

This section discusses what effects may occur for the viability of threatened, endangered and sensitive plant species as a result of the proposed project.

ALTERNATIVE 1 – No Action Alternative

***Botrychium pumicola* Direct and Indirect Effects** - The No-Action Alternative may affect pumice grapefern should an intense wildfire burn the area. Opening up the shrub cover may allow expansion of the grapefern, but it may also negatively affect the grapefern by exposing it to more access and possible trampling by large animals. Additionally, pumice grapefern may be cumulatively affected should more noxious weeds be accidentally introduced into the project area. Diffuse knapweed was found where a new guzzler was recently installed. (Current treatment of the site is by pulling all weed parts and removing and bagging all flowers and seeds for disposal.) Most noxious weed movement on the Deschutes National Forest is linked to the transportation system. (Deschutes National Forest Noxious Weed Control EA, 1998) Increased recreational use of all roads in the project's current transportation system may allow further noxious weed invasion into the project.

Other PETS Plant Species and Habitat Direct and Indirect Effects

The Aspen project area is the site of winter range for large ungulates; deer and elk. The area has been used extensively to graze cattle since the early 1930's. A population of pumice grapefern has been known to exist in the area for many years. 1998 surveys of potential habitat located two more small populations. These three disjunct populations are about 6 miles south of a group of pumice grapefern populations that grow in the Newberry pumice plume, and about 23 miles east north east of sites growing within the La Pine Basin. The original site within the project was found growing in soil that had been dug for a water hole. There was speculation that the grapefern may have been transported into the site by excavation equipment. During 1998, a resurvey of the site was conducted and its extent surveyed with GPS equipment. The population was found to consist of 26 plants and extended to the east away from the water hole along a small shallow drainage. 2 small sites were also located about 0.5 and 1.5 miles north of the water hole. All grow in pumice soils amongst sagebrush. Whether pumice grapefern grew in the area before grazing began and man-made changes took place is unknown, but soils and plant associations within the project area appear to be high probablity habitat for the pumice grapefern. No monitoring of the three sites has been conducted, and any effects of past and current grazing practices upon the plants are unknown.

ALTERNATIVES 2 – Proposed Action Alternative

***Botrychium pumicola* Direct and Indirect effects** – No direct and indirect effects from alternative 2 activities are anticipated for the pumice grapefern populations and habitat, because no activities are planned within the populations or their immediately surrounding areas.

Cumulative effects – Mechanized shrub treatment is planned for units 20 and 22 (near the two grapefern sites). Although this activity will reduce fuels in the units and will also reduce the possibility of a intense wildfire burning through the grapeferns, it will open the units up to potential noxious weed invasion. (See Noxious Weed Risk Assessment for further information and mitigations to reduce the risk of noxious weed introductions.)

Other PETS Plants and Habitat Direct, Indirect, and Cumulative Effects – There are no direct, indirect, or cumulative effects on any other PETS plant species and habitat expected from the implementation of alternative 2, because no other PETS plants and habitat have been found to exist within the project area.

ALTERNATIVE 3

Botrychium pumicola **Direct, Indirect, and Cumulative Effects** – Two BOPU sites exist in Porcupine Flat, where small tree removal is proposed. BOPU may be directly affected should activities take place in the immediate areas of the sites during the spring or summer. Activities that take place in the fall or winter are unlikely to affect BOPU during its dormant phase. The populations in Porcupine Flat comprise less than 0.2% of the total known global pumice grapefern population. Loss of any BOPU plants within the project area is unlikely to affect either the viability of the plant, or lead to a federal listing.

Removing encroaching small conifers from Porcupine Flat may cumulatively affect pumice grapefern in that the Flat will remain an open area and the pumice grapefern requires open habitat (see Habitat Descriptions in Appendix B). Removal of conifers may allow the pumice grapefern to continue to exist there, whereas encroaching conifers may eventually change the habitat of the flat to one where the grapefern could not survive.

Other PETS Plants and Habitat Direct, Indirect, and Cumulative Effects – There are no direct, indirect, or cumulative effects on any other PETS plant species and habitat expected from the implementation of alternative 2, because no other PETS plants and habitat have been found to exist within the project area.

MITIGATIONS

1. If possible, remove small conifers from Porcupine Flat during fall or winter seasons when the pumice grapefern is dormant and unlikely to be disturbed. If activity is to take place in spring or summer, avoid the grapefern sites. They may have to be flagged for avoidance.
2. Avoid the introduction of noxious weeds into the project units and follow the mitigations and management recommendations in the Noxious Weed Risk Assessment.
3. Avoid all sites of cheatgrass during project activities and follow the mitigations in the Noxious Weed Risk Assessment.

COMMUNICATIONS AND REFERENCES

COMMUNICATIONS

David Frantz, Bend/Fort Rock NEPA coordinator (383-4721)
Charmane Levack, Bend/Fort Rock Ecologist (383-4730)

REFERENCES

Bend/Fort Rock District Sensitive Plant Sightings Atlas
Bend/Fort Rock District Cleared Areas Atlas
Bend/Fort Rock District Noxious Weed Atlas
Larsen, 1976. Deschutes National Forest Soil Inventory Guide
Deschutes National Forest Noxious Weed Control E A, 1998

APPENDIX A

SENSITIVE PLANT LIST

Twenty five plants are currently on the Regional Forester's Sensitive Species List (April, 1999) for the Deschutes National Forest, as follows:

Senstive Plant Scientific Name	Species Common Name	Listing Status	Ranger District
Agoseris elata	Tall agoseris	State Endangered	B/FR C S
Arabis suffretescens	Crater Lake rockcress	Federal Candidate	B/FR C
Arnica viscosa	Shasta arnica	Federal Candidate State Threatened	B/FR C S
Artemisia ludoviciana ssp. estesii	Estes' artemisia	Federal Candidate State Threatened	B/FR C S
Aster gormanii	Gorman's aster	Federal Candidate State Threatened	B/FR C S
Astragalus peckii	Peck's millk-vetch	Federal Candidate Stated Threatened	B/FR C S
Botrychium pumicola	Pumice grape-fern	Federal Candidate State Endangered	B/FR C S
Calamagrostis brewerii	Brewer's reedgrass	State Threatened	B/FR C S
Calachortus longebarbatus var. longebarbatus	Long-bearded mariposa lily	Federal Candidate State Threatened	B/FR C S
Carex hystericina	Porcupine sedge		B/FR C S
Carex livida	Pale sedge	State Threatened	B/FR C S
Castilleja chlorotica	Green-tinged paintbrush	Federal Candidate State Threatened	B/FR C S
Cicuta bulbifera	Bulb-bearing water-hemlock	State Threatened	B/FR C S
Collomia mazama	Mt.Mazama collomia	Federal Candidate	B/FR C S
Gentiana newberryi	Newberry's gentian	State Threatened	B/FR C S
Lobelia dortmanna	Water lobelia	State Extirpated	B/FR C S
Lycopodiella inundata	Bog club-moss		B/FR C S
Lycopodium complanatum	Ground cedar	State Threatened	B/FR C S
Ophioglossum vulgatum	Adder's tongue	State Endangered	B/FR C S
Penstemon peckii	Peck's penstemon	Federal Candidate	S
Pilularia americana	American pillwort		B/FR C
Rorippa columbiae	Columbia cress	Federal Candidate	B/FR C S
Scheuchzeria palustris var. americana	Scheuchzeria		B/FR C S
Scirpus subterminalis	Water clubrush		B/FR C S
Thelypodium howellii ssp. howellii	Howell’s thelypody		B/FR C S

State *Ranger District Codes: B/FR=Bend/Fort Rock, C=Crescent, S=Sisters.
A notation in this column may indicate either a documented occurrence or that the species is suspected to occur on that district.

APPENDIX B
HABITAT DESCRIPTIONS
Botrychium pumicola, *Castilleja chlorotica*, and *Pilularia americana*

Botrychium pumicola

BOPU, or pumice grape-fern, is an inconsicuous fern-like species that occurs in recent pumice at high elevations in the Oregon Cascades and in a scattered distribution pattern in Mazama, Newberry or South Sister pumice plume areas of Central Oregon which are typified as montane lodgepole basins or frost pockets. It is an endemic species with a fragmented distribution pattern extending from Crater National Park on the south to Broken Top in the Three Sisters Wilderness in the north to a sage steppe/lodgepole pine forest habitat 65 miles northeast of Crater Lake. It has been found at elevations ranging from 4500' to 9000'. Soils are often fine to coarse pumice or thin pumiceous loamy sands.

Castilleja chlorotica

CACH4 is a perennial eastern Oregon endemic, known only from Deschutes, Lake, and Klamath Counties. It has been found at 4300' to 8200' elevation in open and forested ponderosa, lodgepole, and mixed conifer. It has also been found in nonforested sagebrush-bitterbrush types. Soils are often very poor and rocky.

An important ecological factor to note about the Castilleja genus is that it is hemiparasitic, which means it contains chlorophyll and may or may not be able to complete its life cycle without a host species; hemiparasites primarily draw water and minerals from the host. It is not known which species is the host for CACH4, although it is suspected to be a shrub (Dr. Richard Everett, pers. comm. with Charmane Levack). On the Fremont National Forest, upon which the majority of the known CACH4 population exists, the host is suspected to be sagebrush; on the Deschutes National Forest sites, it may be bitterbrush. Successful CACH4 reestablishment after fire or other disturbance may depend upon reestablishment of its host.

Pilularia americana

Pilularia americana is a small, inconspicuous member of the pepperwort family. It is a grass-like plant that grows 2-4 cm high and has threadlike rhizomes. It produces spores in round sporocarps that grow at the base of the leaf stalks. It grows in clay depressions and dessicating pools. An historic site of *Pilularia americana* is located about 3 miles east of Watkins Flat and just outside the project boundary.

NOXIOUS WEED ASSESSMENT

Date: September 5, 2003

To: David Frantz
Re: Noxious Weed Risk Assessment for Aspen Project
From: Pat Joslin

Summary of Finding: The Aspen project poses a HIGH risk of noxious weed introductions or spread. See pages 2-9 for a discussion of ranking, prevention measures and mitigations.
Forest Service Manual (FSM) direction requires that Noxious Weed Risk Assessments be prepared for all projects involving ground-disturbing activities. For projects that have a moderate to high risk of introducing or spreading noxious weeds, Forest Service policy requires that decision documents must identify noxious weed control measures that will be undertaken during project implementation (FSM 2081.03, 29 November 1995).
This document supports practices that are consistent with direction from the February 3, 1999 Executive Order on Invasive Species (Executive Order #13112). This order requires federal agencies to use relevant programs and authorities to prevent the introduction and spread of invasive species (Appendix B).
Aggressive non-native plants, or noxious weeds, can invade and displace native plant communities causing long-lasting management problems. Noxious weeds can displace native vegetation, increase fire hazards, reduce the quality of recreational experiences, poison livestock, and replace wildlife forage. By simplifying complex plant communities, weeds reduce biological diversity and threaten rare habitats. Potential and known weeds for the Deschutes National Forest are listed in Appendix A.
In addition to noxious weeds, which are designated by the State, there is a group of non-native plants that are also aggressive though are not officially termed "noxious". These species are also included in this assessment.

PROJECT DESCRIPTION
The Aspen Project is about 8 miles southeast of East Butte at the far southeastern end of the Bend/Fort Rock Ranger District within the larger Devil's Garden planning area. The legal description is Township 22 South, Range 16 East and Township 23 South, Range 15 and 16 East. The project aims to manage vegetation by thinning plantations, mowing shrubs to reduce the danger of high-intensity wildfire, and removing small juniper trees to improve range land. Some underburning would also take place to remove vegetation and reduce fuels. Some small conifers, that are encroaching into Porcupine Flat, would be hand cut. 15.43 miles of roads are planned to be either closed or decomissioned.

Alternative 1 - No Action Alternative
Under this alternative, no action would take place. There would be no vegetation management, no vegetation improvement or restoration, no fuel reduction projects, no road closures, and no management of Off-Highway Vehicles.

Alternative 2 – Proposed Action Alternative
Alternative 2 is the project as described above. 4,323 acres are proposed for treatment. Vegetation management for the project would include mowing shrubs in 7 units (318 acres) and a combination of thinning trees and mowing shrubs in 24 units (1,079 acres). Spring or fall underburning to reduce fuels would take place in 7 units (972 acres) and burning under the drip-line of the trees' canopies would take place in 5 units (1,311 acres). One unit of 612 acres would have all encroaching junipers removed to improve habitat for wildlife. Treatment to improve an aspen stand is planned for a 31 acre unit in Aspen Flat. 11.48 miles of roads would be closed and 3.95 miles of road would be decomissioned.

Alternative 3
Alternative 3 is similar to Alternative 2 with the following changes –
Units 24, 30, 29, 31, 32, 44, and 41 are to be dropped.
Units 3, 6, 24, 48 and 50 would be thinned, but there would be nomechanized shrub treatment. Units 27, 28 and 42 would be burned under spring-like conditions and units 26, 43 and 46 would be included in the "Burn under trees" treatment. Unit 49 would be included as a unit for small conifer removal. Trees will be hand cut, dropped and left on site.

RISK RANKING
Factors considered in determining the level of risk for the introduction or spread of noxious weeds are:

__X__ HIGH – for Alternatives 2 and 3
Has to be a combination of the following three factors:

1. Known weeds in/adjacent to project area.
2. Any of vectors* #1-8 in project area.
3. Project operation in/adjacent to weed population.

A high ranking for potential noxious weed introduction was given**,** because the project involves using mowing equipment and prescribed fire. Mowing equipment is fairly light and ground disturbance is expected to be minimal, but there is a risk that weed seeds or parts may be carried into the project area on mowing equipment. Prescribed fire is planned for about 2,283 acres and mineral soil will likely be exposed in parts if not all of the treated units. 3-4 miles of fire lines are to be built that will also expose mineral soil. Exposed soil is particularly vulnerable to noxious weed invasion and already there is one known site of *Centaurea diffusa* Lam, diffuse knapweed, within the project area. (See diffuse knapweed description page 9) The project area is a part of the Quartz Mountain cattle allotment and grazing presents a high risk of noxious weed introductions. Weed seed and parts may be carried in animals hooves, on their coats and in their droppings if they have been previously grazed in weed infested pasture. The project area is also an important area of winter range for large ungulates, deer and elk, that could also carry weed seed in their hooves and on their coats.

The project area has several sites of cheatgrass, *Bromus tectorum*. Cheatgrass is not considered a noxious weed, but it is widespread throughout the west and is an undesirable non-native species. (See cheatgrass description page 9) Most cheatgrass sites are alongside or near roadsides. There are several sites in unit 18, that is scheduled for aspen release. All cheatgrass sites should be avoided. (See Mitigations)

The project area has one site of horehound, *Marrubium vulgare* L. Horehound is a non-native plant that is not a noxious weed. The site is at a cattle water set.

__X__ MODERATE – for Alternative 1

1. Any of vectors #1-5 present in project area.

A moderate ranking was given, because there are cattle allotments within the project area that are used annually and there is a risk that cattle may carry weed seeds and parts into the area. Currently, there is only one site of diffuse knapweed within the project area, but it is at a guzzler that is used by big animals and there is a risk that they may spread weed seed and/or parts in their hooves and on their coats. Noxious weeds on the Deschutes National Forest are most frequently via the transportation system. (Deschutes National Forest Weed Control EA, 1998) Although it is not an area of high recreational use, Off-Highway Vehicle use has increased implying an increased risk of noxious weed invasion.

_____ LOW

1. Any of vectors #6-8 present in project area.

OR

2. Known weeds in/adjacent to project area without vector presence.

Vectors (if contained in project proposal) ranked in order of weed introduction risk:

1. Heavy equipment (implied ground disturbance)
2. Importing soil/cinders
3. OHV's
4. Grazing (long-term disturbance)
5. Pack animals (short-term disturbance)
6. Plant restoration
7. Recreationists (hikers, mountain bikers)
8. Forest Service project vehicles

EFFECTS

Alternative 1, No-Action Alternative

Direct and Indirect Effects; The project area is part of a cattle allotment and is also winter range for large ungulates. It may be directly or indirectly affected should either cattle or other animals carry into the area weed seed or parts in their coats or via their digestive systems.

Cumulative Effects; General vehicle and recreational use may , in the long term, allow noxious weeds to invade the project area.

Alternatives 2 & 3
Direct and Indirect Effects; The project area may be directly or indirectly affected should weed seeds and/or parts be accidentally introduced on heavy equipment, or in water used for prescribed fire. Fire lines that involve exposure of mineral soil, may also allow the invasion of noxious weeds. (See Mitigations for avoidance)
Cumulative Effects; General vehicle and recreational use may, in the long term, allow noxious weeds to invade the project area.

WEED PREVENTION MEASURES

The following goals and guidelines relative to special uses, are listed in the USDA Forest Service Guide to Noxious Weed Prevention Practices. This guide discusses weed prevention that support the 2/3/1999 Executive Order on Invasive Species (Order # 13112). A description follows each item that is relative to the Aspen project.

Required Prevention Measure

1. **For forested vegetation management operations, use equipment cleaning contract provisions WO-C/CT 6.36 (see Appendix 1)**

Optional Prevention Measures

Fire Management
Prescribed Fire

Goal 5. To prevent new weed infestations and the spread of existing weeds, avoid or remove sources of weed seed and propagules or manage fire as an aid in control of weeds.

- Fire 12. Ensure that rental equipment is free of weed seed and propagules before the contracting officers representative accepts it.
  Forest Service equipment is washed regularly to prevent the spread of weeds. Mowers, ATV's, blades and drag bars, that are to be used for fuel reduction and building fire lines, will also be thoroughly cleaned before entering the project area. (All soil and plant particles are to be washed off all equipment that will be used within the project area.)
- Fire 13. Avoid ignition and burning in areas at high risk for weed establishment or spread due to fire effects. Treat weeds that establish or spread because of unplanned burning of weed infestations.
  The known diffuse knapweed site and its immediate area are not within a unit designed for treatment with prescribed fire. Cheatgrass grows in patches along many roads within the project area. Patches along Roads 2320, 2320-500 and and 2320-870 are adjacent to units that are to be treated by prescribed fire. Avoid burning in any areas of cheatgrass and all vehicles should avoid parking or stopping the side of these roads.
- Fire 14. When possible use staging areas and helibases that are maintained in a weed-free condition.
  No staging areas will be located in or near the known diffuse knapweed or cheatgrass sites.
- Fire 15. Pre-inventory project area and evaluate weeds present with regard to the effects on the weed spread relative to the fire prescription.
  The project area was surveyed for noxious weeds during the 2002 field season. All noxious weeds and non-native species were inventoried and mapped.

Forest Vegetation Management
Timber Harvest Operations & Stewardship Contracting

Goal 1. Avoid or remove sources of weed seed and propagules to prevent new weed infestations and the spread of existing weeds.

- Forest Veg 1. Treat weeds on projects used by contractors, emphasizing treatment of weed infestations on existing landings, skid trails, and helibases before activities commence.
  There are no known noxious weed sites within any project units. There are sites of cheatgrass along Roads 2320, 2320-520, 2320-450 and within Unit 18. No landings or skid trails will be located at these sites.

- Forest Veg 2. Train contract administrators to identify noxious weeds and select lower risk sites for landings and skid trails.
  District contract administrators have all been trained to recognize noxious weed species.
- Forest Veg 3. Encourage operators to maintain weed-free mill yards, equipment parking, and staging areas.

- Forest Veg 4. Use standard timber sale contract provisions such as WO-C/CT 6.36 to ensure appropriate equipment cleaning (reference Appendix B).
  This is a required prevention practice.

Goal 2. To prevent weed germination and establishment, retain native vegetation in and around project activity and keep soil disturbance to a minimum consistent with project objectives.

- Forest Veg 5. Minimize soil disturbance to no more than needed to meet project objectives. Logging practices to reduce soil disturbance include, but are not limited to:
  - Over-snow logging
  - Skyline or helicopter logging
    This is not feasible for this project.
  - Reuse landings, skid trails and helibases when they are weed free
- Forest Veg 6. Minimize period from end of logging to site preparation, revegetation, and contract closure.

Post Vegetation Management Operations

Goal 3. To prevent weed germination and establishment, retain native vegetation in and around project activity and keep soil disturbance to a minimum consistent with project objectives.

- Forest Veg 7. Minimize soil disturbance to no more than needed to meet vegetation management objectives. Prevention practices to reduce soil disturbance include, but are not limited to:
  - Treating fuels in place instead of piling
  - Minimizing heat transfer to soil in burning
  - Minimizing fireline construction
    In some underburn units, fire lines will be built that will expose mineral soil. Less than 2 miles of fireline are projected to be constructed and when the project is finished, the they will be obliterated by raking the organic matter back over the exposed soil.

Goal 4. To prevent favorable conditions for weed establishment, re-establish vegetation on bare ground caused by project disturbance.

- Forest Veg 8. For long-term restoration and weed suppression where forested vegetation management has created openings, recognize the need for prompt reforestation.

Road Management
New and Reconstruction

Goal 1. Incorporate weed prevention into project layout, design, alternative evaluation, and decisions.

- Road 1. For timber sale purchaser road maintenance and decommissioning, use standard timber sale contract provisions such as WO-C/CT 6.36 to ensure appropriate equipment cleaning (reference Appendix 1).
  No new roads are planned for this project.
- Road 2. For road new and reconstruction conducted as part of public works (construction) contracts and service contracts include contract language for equipment cleaning such as is in WO-C/CT 6.36 (Appendix 1).

Road Maintenance and Decommissioning

Goal 2. Minimize roadside sources of weed seed that could be transported to other areas.
The known diffuse knapweed site was added to the Deschutes National Forest's noxious weed inventory for treatment. All knapweed plants were pulled and removed from the site during 2002.

- Road 3. Periodically inspect system roads and rights-of-way for invasion of noxious weeds. Train road maintenance staff to recognize weeds and report locations to the local weed specialist. Inventory weed infestations and schedule them for treatment.

All major roads within the project were surveyed for noxious weeds during the 2002 field season. The project will be monitored for noxious weed invasions for 2 years after the project ends.

- Road 4. Schedule and coordinate blading or pulling of noxious weed-infested roadsides or ditches in consultation with the local weed specialist. Do not blade or pull roadsides and ditches that are infested with noxious weeds unless doing so is required for public safety or protection of the roadway. If the ditch must be pulled, ensure the weeds remain on-site. Blade from least infested to most infested areas. When it is necessary to blade noxious weed-infested roadsides or ditches, schedule activity when seeds or propagules are least likely to be viable and to be spread. Minimize soil surface disturbance and contain bladed material on the infested site.
- Road 5. Avoid acquiring water for dust abatement where access to the water is through weed-infested sites.
- Road 6. For timber sale purchaser road maintenance and decommissioning, use contract provisions for equipment cleaning such as WO-C/CT 6.36 (Appendix 1).
  This is a required prevention practice and a noxious weed design element.
- Road 7. For road maintenance and decommissioning conducted as part of public works (construction) contracts and service contracts include contract language for equipment cleaning such as is in WO-C/CT 6.36 (Appendix 1).
  This is a required prevention practice and a noxious weed design element.
- Road 8. Treat weeds in road decommissioning and reclamation projects before roads are made impassable. Reinspect and follow-up based on initial inspection and documentation.
  Skid trails are to be monitored for noxious weeds for 2 years following completion of the Aspen project. Any new infestations will be inventoried and treated as appropriate.

Wildlife, Fisheries, and Botany

Goal 1. Avoid creating soil conditions that promote weed germination and establishment.

- Wildlife 1. Periodically inspect and document those areas where wildlife concentrate in the winter and spring resulting in overuse or soil scarification.
  Diffuse knapweed was found at a guzzler site within the project boundaries. The site has been added to the Deschutes National Forest noxious weed inventory and is being treated.
- Wildlife 2. Use weed-free materials at big game baiting stations.
- Wildlife 3. For wildlife openings and habitat improvement projects, follow the practices outlined in General Weed Prevention Practices--Goal 4; Forest Vegetation Management, Timber Harvest Operations & Stewardship Contracting.
  Unit 18 is scheduled for aspen release. There are pockets of cheatgrass throughout the unit, that should be avoided.

MITIGATIONS - ALTERNATIVES 2 & 3

1. Use contract and permit clauses to prevent the introduction or spread of noxious weed by contractors and permitees. (CT6.35 Equipment Cleaning in the FS-2400-6 and -6T Contracts)
2. All Forest Service equipment such as mowers and fire equipment will be washed before being used in the area.
3. Avoid diffuse knapweed. This site has been added to the district's annual schedule for monitoring and manual treatment.
4. Avoid cheatgrass sites by not parking or driving vehicles in them. It may be necessary to flag sites for avoidance.
5. Monitor the project work area for 2 years after work is completed, map and pull any new noxious weed sites as necessary.
6. Water for dust abatement and fire control will be acquired where access to water is weed-free.
7. All fire lines are to be obliterated after the project ends by raking back the organic matter that was moved.

NOXIOUS WEEDS OF CONCERN FOR THE PROJECT AREA

Spotted knapweed, *Centaurea maculosa* Lam., is a very invasive plant that grows along most major highways in Central Oregon**.** It is a perennial forb in the sunflower family that lives for 3-5 years. It is very competitive on disturbed dry to mesic sites because it is able to germinate in a wide range of conditions and it grows early in Spring before many native plants. Seeds may be dispersed on animals and humans, and by being caught up in vehicles. Distribution over large areas is linked to transportation systems. Known sites along major roads on the Bend/Fort Ranger District are currently being treated under the Deschutes National Forest Noxious Weed Control Environmental Assessment (1998).

Diffuse knapweed, *Centaurea diffusa* Lam., is similar to spotted knapweed and grows in the same types of habitats. The involucel bracts, (those growing below the inflorescence [flower head]) are spine-tipped and workers should be careful when

pulling these plants.

Dalmatian toadflax, *Linaria dalmatica* (L.) Mill., is another invasive plant that has been increasing in numbers of occurrences in the Central Oregon area. Toadflax, a member of the figwort family, is also a perennial plant. It spreads by both seeds and lateral root extensions. Its seeds can remain viable for up to 10 years. Movement is linked to transportation systems and spread locally from the roadside into pastures and range. In the past, some biological controls have been used by the forest, but none appear to have been successful.

NON-NATIVE PLANT SPECIES OF CONCERN FOR THE PROJECT AREA

Cheatgrass, *Bromus tectorum* L, was introduced into North America from Eurasia in the 1800's. It is an annual grass that grows densely and becomes dry in early June, creating a fire hazard and a fuel ladder to other plants. In the arid portions of the Intermountain West, cheatgrass has advanced from scattered plants to nearly pure stands over vast ares. Its success is due to its competitive ability with the native plants and the dense, fine fuel it produces, which subsequently leads to an increased frequency of wildfire. Cheatgrass is very competitive and difficult to displace without extensive treatments (Pellant and Hall 1994). Cattle have been grazed in the project area since the early 1930's and range monitoring plots reported cheatgrass in the 1950's. (9 April, 2003 Personal communication with Don Sargent, Range Specialist, Deschutes and Ochoco National Forests) A 2002 weed survey of the project area found patches of cheatgrass growing in disturbed areas along roadsides, at water sets and guzzlers, and around the edge of a quarry. Any project activities near these sites that cause ground disturbance or removal of native plants would allow cheatgrass an opportunity to spread.

Horehound, *Marrubium vulgare* L. is a member of the mint family that is native to Europe. It is a perennial forb that was probably introduced into the western world as a garden plant to be used in medicine. It has hooked spines on the cayx which cling to the hair of animals and clothing (Gaines & Swan 1972). It grows in one site within the project area.

Documented and potential noxious weeds known to occur on the Deschutes National Forest are listed in Appendix A at the end of this document.

REFERENCES AND COMMUNICATIONS

David Frantz, NEPA Specialist, Bend/Fort Rock Ranger District
Charmane Levack, District Ecologist, Bend/Fort Rock Ranger District
Don Sargent, Range Specialist, Deschutes and Ochoco National Forests

Bend/Fort Rock District Noxious Weed Atlas
Executive Order on Invasive Species (Order # 13112), 2/3/1999
USDA Forest Service, July 5, 2001, Guide to Noxious Weed Prevention Practices
Deschutes National Forest Noxious Weed Control Environmental Assessment, September 1998
Xerpha M. Gaines & D. G. Swan. 1972. *Weeds of Eastern Washington and Adjacent Areas*
Tom D. Whitson, et al. 1991. *Weeds of the West*. The Western Society of Weed Science in cooperation with the Western States Land Grant Universities

APPENDIX A

DESCHUTES NATIONAL FOREST NOXIOUS WEED LIST
Updated 10/31/97

The following species are listed by the Oregon Department of Agriculture as noxious weeds. These are species designated by the Oregon State Weed Board as injurious to public health, agriculture, recreation, wildlife, or any public or private property.

Scientific Name	Common Name	Presence	Code
Agropyron repens	Quackgrass	Documented	AGRREP
Cardaria (=Lepidium) draba	Whitetop	Potential	CARDRA
Carduus nutans	Musk thistle	Potential	CARNUT
Carduus pycnocephalus	Italian thistle	Potential	CARPYC
Centaurea diffusa	Diffuse knapweed	Documented	CENDIF
Centaurea maculosa	Spotted knapweed	Documented	CENMAC
Centaurea pratensis	Meadow knapweed	Potential	CENPRA
Centaurea repens	Russian knapweed	Potential	CENREP
Centaurea solstitialis	Yellow starthistle	Potential	CENSOL
Centaurea virgata ssp. squarrosa	Squarrose knapweed	Potential	CENVIR
Cirsium arvense	Canada thistle	Documented	CIRARV
Cirsium vulgare	Bull thistle	Documented	CIRVUL
Conium maculatum	Poison hemlock	Potential	CONMAC
Cynoglossum officinale	Common houndstongue	Documented	CYNOFF
Cytisus scoparius	Scotch broom	Documented	CYTSCO
Euphorbia esula	Leafy spurge	Documented	EUPESU
Hypericum perforatum	St. Johnswort	Documented	HYPPER
Isatis tinctoria	Dyer's woad	Documented	ISATIN
Kochia scoparia	Kochia	Potential	KOCSCO
Linaria dalmatica	Dalmation toadflax	Documented	LINDAL
Linaria vulgaris	Butter and eggs	Documented	LINVUL
Lythrum salicaria	Purple loosestrife	Potential	LYTSAL
Onopordum acanthium	Scotch thistle	Documented	ONOACA
Salvia aethiopis	Mediterranean sage	Potential	SALAET
Senecio jacobaea	Tansy ragwort	Documented	SENJAC
Taeniatherum caput-medusae	Medusahead	Documented	TAECAP

APPENDIX E

ROADS ANALYSIS

Aspen Planning Area "Road Analysis"

Road	BMP	EMP	Length	**Proposed Recommendations** **A. Maintain at Current Level** **B. Upgrade Maintenance Level** **C. Decrease Maintenance Level** **D. Restrict Travel/Seasonal Closure** **E. Close** **F. Decommission**	Final Recommendation	Current Maintenance Level	Changed Maintenance Level
2315000	2.7	12.0	9.3	Forest-Wide Road analysis	A. Maintain at Current Level	2	No Change
2320000	0.0	1.3	1.3	Forest-Wide Road analysis	A. Maintain at Current Level	2	No Change
2325000	2.8	5.3	2.5	Forest-Wide Road analysis	A. Maintain at Current Level	2	No Change
1419800	0.0	1.7	1.7	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315200	1.1	1.5	0.5	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315300	0.0	4.2	4.2	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315310	0.0	3.1	3.1	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315315	0.0	1.1	1.1	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315320	0.0	0.7	0.7	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315321	0.0	0.4	0.4	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315330	0.0	1.1	1.1	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315340	0.0	2.6	2.6	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315350	0.0	0.8	0.8	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315370	0.0	0.1	0.1	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315380	0.9	1.3	0.4	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315382	0.0	0.2	0.2	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315400	0.0	2.6	2.6	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315420	0.0	1.0	1.0	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315421	0.0	0.2	0.2	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315422	0.0	2.7	2.7	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315426	0.0	0.9	0.9	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315450	0.0	0.6	0.6	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315455	0.0	0.4	0.4	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315460	0.0	0.7	0.7	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315470	0.0	1.3	1.3	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315475	0.0	0.8	0.8	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315500	0.0	2.0	2.0	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315520	0.0	1.8	1.8	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315525	0.0	0.7	0.7	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315630	0.0	0.1	0.1	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315660	0.0	1.0	1.0	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315700	0.0	2.1	2.1	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315720	0.0	0.3	0.3	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315730	0.0	0.1	0.1	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315735	0.0	0.6	0.6	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315740	0.0	0.8	0.8	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315760	0.0	1.9	1.9	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315766	0.0	0.8	0.8	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change

Aspen Planning Area "Road Analysis"

Road	BMP	EMP	Length	**Proposed Recommendations** **A. Maintain at Current Level** **B. Upgrade Maintenance Level** **C. Decrease Maintenance Level** **D. Restrict Travel/Seasonal Closure** **E. Close** **F. Decommission**	Final Recommendation	Current Maintenance Level	Changed Maintenance Level
2315768	0.0	0.4	0.4	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315769	0.0	0.4	0.4	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315780	0.0	0.8	0.8	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315785	0.0	0.7	0.7	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315800	0.0	3.0	3.0	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315810	0.0	1.3	1.3	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315815	0.0	0.5	0.5	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315820	0.0	0.5	0.5	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315830	0.0	2.3	2.3	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315837	0.0	0.4	0.4	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315860	0.0	0.4	0.4	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315870	0.0	0.7	0.7	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315880	0.0	1.2	1.2	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315885	0.0	0.5	0.5	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315895	0.0	0.8	0.8	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315900	0.0	0.8	0.8	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315920	0.0	1.2	1.2	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315925	0.0	0.1	0.1	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315928	0.0	0.3	0.3	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315950	0.0	0.2	0.2	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315960	0.0	0.4	0.4	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315980	0.0	0.2	0.2	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2320600	0.0	1.1	1.1	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2320660	0.0	0.6	0.6	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2320669	0.0	0.1	0.1	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2320700	1.8	2.5	0.7	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2320900	0.6	1.6	1.0	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2325011	0.7	2.4	1.7	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2325019	0.0	0.4	0.4	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2325700	0.0	2.2	2.2	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2325710	0.0	1.3	1.3	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2325720	0.0	0.7	0.7	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2325725	0.0	1.7	1.7	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2325780	0.0	0.4	0.4	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2325800	0.0	0.1	0.1	A. Maintain at Current Level	A. Maintain at Current Level	2	No Change
2315340	0.0	2.6	2.6	E. Close	E. Close	2	1
2315350	0.0	1.0	1.0	E. Close	E. Close	2	1
2315382	0.0	0.2	0.2	E. Close	E. Close	2	1
2315400	1.3	2.7	1.4	E. Close	E. Close	2	1

Aspen Planning Area "Road Analysis"							
Road	**BMP**	**EMP**	**Length**	**Proposed Recommendations** **A. Maintain at Current Level** **B. Upgrade Maintenance Level** **C. Decrease Maintenance Level** **D. Restrict Travel/Seasonal Closure** **E. Close** **F. Decommission**	**Final Recommendation**	Current Maintenance **Level**	**Changed Maintenance Level**
2315426	0.0	0.9	0.9	E. Close	E. Close	2	1
2315460	0.0	0.7	0.7	E. Close	E. Close	2	1
2315669	0.0	0.4	0.4	E. Close	E. Close	2	1
2315720	0.0	0.3	0.3	E. Close	E. Close	2	1
2325725	0.0	1.7	1.7	E. Close	E. Close	2	1
2315740	0.0	0.8	0.8	E. Close	E. Close	2	1
2315760	1.2	1.9	0.7	E. Close	E. Close	2	1
2315768	0.0	0.4	0.4	E. Close	E. Close	2	1
2315769	0.0	0.4	0.4	E. Close	E. Close	2	1
2315780	0.0	0.8	0.8	E. Close	E. Close	2	1
2315785	0.0	0.7	0.7	E. Close	E. Close	2	1
2315837	0.0	0.4	0.4	E. Close	E. Close	2	1
2315860	0.0	0.4	0.4	E. Close	E. Close	2	1
2315895	0.0	0.8	0.8	E. Close	E. Close	2	1
2315928	0.0	0.3	0.3	E. Close	E. Close	2	1
2315980	0.0	0.2	0.2	E. Close	E. Close	2	1
2315810	0.0	1.3	1.3	F. Decommission	F. Decommission	2	Remove
2315815	0.0	0.5	0.5	F. Decommission	F. Decommission	2	Remove
2315920	0.0	1.2	1.2	F. Decommission	F. Decommission	2	Remove
2315925	0.0	1.4	1.4	F. Decommission	F. Decommission	2	Remove
2315900	0.0	0.8	0.8	F. Decommission	F. Decommission	2	Remove

Road Summary			
Pre-Roads Analysis		**Post-Roads Analysis**	
Total Planning Area Acres: 15,095	23.59 Square Miles	Total Planning Area Acres: 15,095	23.59 Square Miles
Arterial and Collector Road Miles	13.05	Arterial and Collector Road Miles	13.05
Open Local Road Miles	88.99	Open Local Road Miles	68.61
		Miles Proposed for Closure	15.19
		Miles Proposed for Decommissioning	5.19
Total Open Road Miles	102.04	Total Open Road Miles	81.66
Miles per Square Mile	**4.33**	**Miles per Square Mile**	**3.46**

APPENDIX F

RESPONSE TO COMMENTS
30-DAY COMMENT PERIOD
April 7, 2004 through May 7, 2004

Comments/Responses for Aspen 30-Day Comment Period

Introduction
A 30-comment period for the Aspen environmental assessment proposed activities was provided for interested and affected publics, including appropriate local, state, and federal government agencies and Tribes. This period lasted from April 7, 2004 to May 7, 2004. The responsible official will consider the comments in the decision-making process.

The Forest Service received comments from 3 responders, as listed in the table below. All comments were reviewed and substantive comments received the focus during this comment analysis. The complete comment record is kept within the Kelsey Project public record and is available for review at the Bend/Fort Rock Ranger District, Bend, Oregon. The following table lists the comment letters received. The EA responded to the comments with further analysis or clarification within the document where it was appropriate.

Table 1. Comments Received During the EA 30-Day Comment Period.

Contact	**Author**	**Organization**
1 – Letter – 4/13/04	John Morgan	Ochoco Lumber Company
2 – Phone – 4/26/04 and 5/12/04	Mark Silcocks	Individual
3 – E-mail – 5/4/04	Doug Heiken	Oregon Natural Resources Council

Page numbers that are referred to in the responses to comments are from the EA that was mailed to the public for comments during the 30-day comment period, April 7 through May 7, 2004 unless specifically stated as the Final EA.

Ochoco Lumber Company – John Morgan

Comment	**Response**
We support your purpose and need for action in this area. We support activities that would lower fuel loads thus decreasing the risk of catastrophic wildfires. We also support thinning to reduce stocking levels in over-crowded timber stands that would stimulate stand health and vigor.	No response is necessary.
We encourage the eradication of encroaching Western Juniper in areas that are not historical for this species as well as Aspen stand enhancement activities.	Western juniper will not be eradicated under this EA. The cutting of juniper under 8 inches diameter at breast height will provide conditions that will allow the reestablishment of mountain mahogany. Larger juniper will remain.
…we do not totally agree with permanent road closures in deer winter range areas. When properly located, roads are useful for fire suppression, recreation, and other administrative purposes. Signing, gating, and other means of closure should be considered and implemented before permanent closures are instituted. Please reconsider the closing, or decommissioning, of approximately 20 miles of Forest Service roads and look at gates as a means of restricting use rather than the total loss of use through decommissioning.	A roads needs analysis was completed for this project. In identifying road for closure, an effort was made to balance the need to reduce wildlife habitat fragmentation with the need to provide access for recreation, fire suppression, and other administrative purposes. Only roads necessary to mitigate effects to wildlife were identified for closure in the roads needs analysis. Many of the road miles identified for closure or decommissioning are either redundant (having the same destination), parallel, or are overgrown/difficult to locate. Roads that are identified for closure, not decommissioning, will be closed in the most cost and closure effective manner available. These roads will be available for future administrative use.
We would also like to point out that the financial expense of decommissioning can be very high.	**Response:** No response is necessary.

Mark Silcocks

Comment	**Response**
ODFW (Oregon Department of Fish and Wildlife says that the deer herd is doing well in the Aspen area. Take the manzanita and leave the bitterbrush. Just concerned that we'll lose habitat. Likes the tall sage and bitterbrush for deer.	The manzanita is not the main concern for maintaining deer habitat. The planning area has high densities of bitterbrush and ponderosa pine. Flame lengths of manzanita average 6 feet and bitterbrush average 15 feet. To reduce the risk of high intensity, stand replacement wildfire, it is necessary to reduce shrub and tree density. Mowing and/or prescribed burning of bitterbrush will break up the fuels continuity and reduce the associated wildfire risk.

Oregon Natural Resources Council (ONRC) – Doug Heiken

<table>
<tr><th>Comment</th><th>Response</th></tr>
<tr><td>In general, this type of non-commercial restoration project is the type of project that ONRC can support. The fact that commercial logging is not involved here relieves much of our usual concern that merchantable trees are being taken for the wrong reasons.</td><td>It is satisfying for the Forest Service to have this type of general support for our projects. As is generally the case, if the byproduct of a project produces economically viable removal of firm wood fiber from the project area, much of that fiber will be removed and provided for commercial purposes. If not economically viable, firm wood fiber may be left for wildlife habitat, or provided for general public firewood gathering at landing sites with residual wood possibly piled and burned.</td></tr>
<tr><td>Unit 37 is a 610-acre juniper removal unit. The portion of the unit located southeast of road 242? Is in an uninventoried roadless area > 1,000 acres. We want to make sure that this treatment is done carefully in order to protect its outstanding ecological characteristics.</td><td>Unit 37 is located southeast of road 830. The unit is adjacent to Bureau of Land Management (BLM) lands. The area without system roads comprises approximately 2,800 acres, with approximately 700 acres within the planning area and Forest Service lands. Approximately 415 acres of juniper would be treated to reduce juniper density and create a seedbed for mahogany regeneration. Minor reductions of potential habitat for species that utilize juniper, particularly birds, is expected to be negligible, as juniper trees to be felled would be small and widely spaced (EA page 33). It is important to protect and enhance the outstanding ecological characteristics associated with this unit.</td></tr>
<tr><td>I could not find any real analysis of effects in the EA for the juniper removal portion of this project. … the project would retain a large number of juniper trees >8 inches in diameter.</td><td>The Wildlife Report references effects of the juniper removal on a variety of wildlife habitats (pages 21-23, 25, 26 and 28). The effects to mountain mahogany habitat (shrub) would be beneficial. The shrub habitat discussion focused mainly on bitterbrush. The EA improved the discussion of effects to juniper removal/mountain mahogany habitat. The diameter limit for junipers to be removed is 8 inches dbh.

Non-mechanical treatments would likely be accomplished by hand-felling small diameter trees with chainsaws and leaving these materials on site. The EA (page 39) states, “Hand-felling trees would not detrimentally disturb the soil. Some thinned trees would remain on the ground to provide surface cover and a source of nutrients as these organic materials gradually decompose……Nutrient releases would likely benefit site productivity in these small, localized areas”.</td></tr>
<tr><td>Use of the DecAID advisor must be documented and justified. The LRMP requires that FS to provide for a certain “potential population level” of cavity dependent species. DecAID does not translate well into potential population levels. The Deschutes should prepare a plan amendment to support this shift in methodology. The 30-50% tolerance levels provided in this project may not be enough. 50-80% tolerances would probably be more appropriate.</td><td>“The DecAID Advisor is a planning tool intended to help advise and guide managers as they conserve and manage snags, partially dead trees, and down wood for biodiversity. DecAID is not used for predicting species viability. It is based on scientific research and does not rely on modeling the biological potential of wildlife populations. It represents a compilation of the best science available in the region in order to manage snags and logs. The Forest Plan relies on information from Thomas, et. al. 1979. DecAID incorporates research since that time, taking into account wildlife habitat type, fire regime, plant association, topographic positions, and current structural stage. Tolerance levels were chosen as a way to express the needs of species because it allowed for the best integration of statistical analyses from a variety of studies. A complete explanation of DecAID can be found at the website: http://wwwnotes.fs.fed.us:81/pnw/DecAID/DecAID.nsf

The following tables compare current Forest Plan (based on Thomas, 1979; Ponderosa pine community) standards and the DecAID snag analysis. The DecAID analysis for the Aspen planning area often met or exceeded the snag levels recommended in the Forest Plan, especially for snags greater than 20” dbh.

<table>
<tr><th colspan="4">Table 1: Deschutes National Forest Land and Resource Management Plan</th></tr>
<tr><th>Potential Population Level (%)</th><th>Total Snags (#/ac)</th><th>Snags ≥ 10”-19.9” dbh (#/ac)</th><th>Snags ≥ 20” dbh (#/ac)</th></tr>
<tr><td>100</td><td>2.25</td><td>2.11</td><td>0.14</td></tr>
<tr><td>60</td><td>1.35</td><td>1.27</td><td>0.08</td></tr>
<tr><td>40</td><td>0.90</td><td>0.85</td><td>0.05</td></tr>
</table>

<table>
<tr><th colspan="4">Table 2: Aspen DecAID analysis Ponderosa Pine/Douglas-fir wildlife Habitat Type</th></tr>
<tr><th>Tolerance Level (%)</th><th>Total Snags (#/ac)</th><th>Snags ≥ 10”-19.9” dbh (#/ac)</th><th>Snags ≥ 20” dbh (#/ac)</th></tr>
<tr><td>50</td><td>2.7-6.5</td><td>1.6-2.9</td><td>1.1-3.6</td></tr>
<tr><td>30</td><td>1.8-3.2</td><td>0.7-1.9</td><td>1.1-1.3</td></tr>
</table>
</td></tr>
</table>

Comment	Response
ONRC would prefer that the FS use fire and other non-mechanical means whenever possible. Mechanical treatment can cause adverse effects on soils, fuels, and the spread of weeds.	The EA (pages 39 and 40) disclosed, "The use of specialized equipment to treat fuel accumulations in random locations of activity areas would only be used where machine piling on existing facilities could not be employed. Equipment would not be used in portions of activity areas that contain sensitive soils with slopes greater than 30 percent. Mitigation measures, including operational guidelines for equipment use, would be enforced to avoid or minimize mechanical impacts to the soil resource". The project has been designed to be consistent with Regional policy (FSM 2520, R-6 Supplement No. 2500-98-1) and LRMP standards and guidelines for protecting and maintaining soil productivity (EA pages 52 and 53). The Mitigation Measures (page 57) list prevention practices to reduce the risk of weed introduction and spread in the Project area.

GLOSSARY

ACRONYMS AND DEFINITIONS

ACRONYMS

BE: Biological Evaluation
BMP: Best Management Practice
CWM: Coarse Woody Material
DBH: Diameter at Breast Height
EPA: Environmental Protection Agency
FS: Forest Service
FSH: Forest Service Handbook.
FSM: Forest Service Manual.
GTR: Green Tree Replacement
INFISH: Inland Native Fish Strategy
LOS: Late and Old Structure
LRMP: Land and Resource Management Plan, Forest Plan
M: Thousand
MBF: Thousand Board Feet
MM: Million
MMBF – Million Board Feet
MA: Management Area
MIIH: May Impact Individuals or Habitat
MST: Mechanical Shrub Treatment
NEPA: National Environmental Policy Act
NFMA: National Forest Management Act
NE: No Effect
NI: No Impact
NFS: National Forest System.
NRHP: National Register of Historic Places
OHV: Off Highway Vehicle
PAG: Plant Association Group
PCT: Pre-commercial Thinning, Non- commercial Thinning
PNC: Potential Natural Community
PFA: Post-fledgling Area
SHPO: State Historic Preservation Office
SMS: Scenery Management System
UB: Underburning: Spring Like Conditions
USFS: United States Forest Service
VMS: Visual Management System
WRHU: Winter Range Habitat Unit
WUI: Wildland/Urban Interface

DEFINITIONS

A

Access: See public access.

Affected Environment: The natural and physical environment and the relationship of people to that environment that will or may be changed by proposed actions.

Alternative: In Forest planning, a mix of management prescriptions applied in specific amounts and locations to achieve a desired management emphasis as expressed in goals and objectives.

Analysis Area: The basic land unit of analysis that is used to allocate and schedule management prescriptions.

Aspen release: To 'release' established aspen trees from a situation in which they have been suppressed. By thinning out or removing undesirable trees and shrubs that have overtopped them. Carried out to improve the growth of the aspen trees released.

All-Terrain Vehicles (ATV): A subset of Off Highway Vehicles (OHV) consisting of Class I (three wheelers, four wheelers) and Class III (motorcycles) as defined by the State of Oregon.

B

Best Management Practice (BMP): Practice employed in the absence of other scientific standards and guidelines designed to mitigate or eliminate an adverse effect.

Biological Diversity: The number and abundance of species found within a common environment. This includes the variety of genes, species, ecosystems, and the ecological processes that connect everything in a common environment. The variety of life and its processes within communities and ecosystems.

Biological Evaluation (BE): Describes and displays the effects to Proposed, Endangered, Threatened, and Sensitive (PETS) fauna species

C

Canopy: The forest cover of branches and foliage formed by tree crowns.

Canopy Closure: The progressive reduction of space between crowns as they spread laterally, increasing canopy cover.

Canopy Cover: The percentage of a fixed area covered by crowns of plants delimited by a vertical projection of the outermost perimeter of the spread of the foliage.

Competing Vegetation: Vegetation that seeks and uses the limited common resources (space, light, water, and nutrients) of a forest site needed by preferred trees for survival and growth.

Coarse Woody Material (CWM): Dead and down material greater than 10 inches DBH at the small end.

Corridor: A linear strip of land that has ecological, technical, economic, social or similar advantages over other areas for the present or future location of transportation or utility rights-of-way.

Critical Habitat: That portion of a wild animal's habitat that is critical for the continued survival of the species. Areas designated for the survival and recovery of federally listed threatened or endangered species.

Cultural Resources: The physical remains (artifacts, ruins, burial mounds, petroglyphs, etc.) and conceptual content or context (as a setting for legendary, historic, or prehistoric events, as a sacred area of native peoples, etc.,) of an area associated with human use capable of providing scientific or humanistic understanding of past human behavior, cultural adaptation and related topics through the application of scientific or scholarly techniques of investigation. Synonymous with Heritage Resources.

Cumulative Effects: Effects on the environment that result from separate, individual actions that, collectively, become significant over time.

Cumulative Effects Area (CEA): The portion of a study area on which the effects from implementing project activities are expected to occur (and may occur outside the project analysis area).

D

Diameter at Breast Height (DBH): The stem diameter of a tree measured at breast height, 4.5 feet above the ground.

Desired Condition: A description of the desired human dimension, production, and physical/biological characteristics to be achieved on an area.

Developed Recreation: Recreation use that utilizes constructed facilities and that concentrates at developed sites, e.g., campgrounds, picnic grounds, downhill ski areas, and observation sites.

District: See Ranger District. A sub-unit of a National Forest for management and administration purposes.

Disturbance: A discrete event, either natural or human-induced, that causes a change in the existing condition of an ecological system.

Dominant: Trees with crowns extending above the general level of the canopy and receiving full light from above and partly from the side; taller than the average trees in the stand with crowns well developed.

E

Ecosystem: A complex of living organisms interacting with their environment.

Endangered Species: Any species that is in danger of extinction through all or a significant portion of its range and which has been designated in the Federal Register by the Secretary of the Interior as an endangered species.

Environmental Assessment: A document of an environmental analysis which provides a basis for determining whether to prepare an environmental impact statement or a finding of no significant impact, and includes a discussion of alternatives and their impacts adequate to allow an alternative to be chosen.

Environmental Effects: Project proposals can have the following effects:

- **Direct Effects** are effect caused by the proposed action, and occur at the same time and place as the proposed action.
- **Indirect Effects** are caused by proposed, similar or connected actions, that occur either later in time or farther removed in distance, but are reasonably foreseeable.
- **Cumulative Effects** result from the incremental impact of the proposed action when added to other past, present, or reasonably foreseeable actions.

Environmental Protection Agency EPA:

Ephemeral Stream: Streams that flow only as the direct result of rainfall or snowmelt. They have no permanent flow. By definition, they display a scoured channel.

Erosion: The wearing away of the land surface by running water, wind, ice, or other glacial agents. Erosion includes detachment and movement of soil or rock fragments by water, wind, ice, or gravity.

Existing Condition: A description of present-day human dimensions, production, physical/biological characteristics of an area.

F

Forest Health: A measure of the robustness of forest ecosystems. Aspects of forest health include biological diversity; soil, air, and water productivity; natural disturbances; and the capacity of the forest to provide a sustaining flow of goods and services for people.

Forest Land: Land at least ten percent stocked by forest trees of any size, or formerly having had such tree cover, and not currently developed for non-forest use.

Fragmentation: Breaking up of a continuous area into progressively smaller patches of increasing degrees of isolation.

Fuels: Plants and woody vegetation, both living and dead, that are capable of burning.

Fuels management: The treatment of fuels that would otherwise interfere with effective fire management or control. For instance, prescribed fire can reduce the amount of fuels that accumulate on the forest floor before the fuels become so heavy that a natural wildfire in the area would be explosive and impossible to control.

Fuels Treatment: The rearrangement or disposal of natural or activity fuels to reduce the fire hazard. Fuels are defined as both living and dead vegetative materials consumable by fire.

G

Geographic information system (GIS): A computer system designed to allow users to collect, manage and analyze large volumes of spatially referenced information and associated attribute data.

Goals: A concise statement of the state or condition that the land and resource management plan is designed to achieve. A goal is usually not quantifiable and may not have a specific date for completion.

Goshawk Foraging Area: Areas where prey are searched for and captured by goshawks. Desired size of foraging areas is approximately 5400 acres (not including nest stand and post fledgling area).

Goshawk Nest Area: The nest tree and stand surrounding the nest that contains prey handling areas, perches and roosts. Often referred to as the nest stand, usually approximately 30 acres in area.

Ground-based Harvesting Systems: Logging systems that employ ground-based equipment such as feller-bunchers, skidders, and forwarders.

Green Tree Replacement (GTR): Trees retained, or managed through time, to provide snags or CWM habitat at some point in the future.

Guideline: Any issuance that assists in determining the course of direction to be taken in any planned action to accomplish a specific objective.

H

Habitat: The natural environment of a plant or animal. The locality where the organism may generally be found, and where all essentials for its development or existence are present. Habitats are described by their geographical boundaries, or with such terms as "shady woodlands", "banks of streams", "dry hillsides", etc.

Habitat Type: An aggregation of all land areas potentially capable of producing similar plant communities at climax.

Hand Pile: A fuels treatment where unwanted fuels are manually stacked by hand. Piles are then burned when conditions are safe to do so.

Harvesting: The practice of felling and removing trees or the removal of dead or damaged trees from an area.

HRV - Historical Range of Variability: The range of the spatial, structural, compositional and temporal characteristics of ecosystem elements during a period specified to represent "natural" conditions.

I

Increment: The increase in diameter, basal area, height, volume, quality or value of individual trees or stands during a given period.

Indicator Species: A wildlife species whose presence in a certain location or situation at a given population level indicates a particular environmental condition. Population changes are believed to indicate effects of management activities on a number of other wildlife species.

Inland Native Fish Strategy (INFISH): Interim Strategies for Managing Fish-Producing Watersheds in Eastern Oregon and Washington, Idaho, Western Montana and Portions of Nevada.

Interdisciplinary Team (IDT): Collective participation or two or more disciplines or fields of specialized (ID Team) technical knowledge for natural resources management.

Intermittent Stream: Streams that flow only as the direct result of rainfall or snowmelt. They have no permanent flow. By definition, they display a scoured channel (Ephemeral stream).

Issue: Problem requiring resolution, or condition constraining management practices, identified by the interdisciplinary team or public. See Public Issue

L

Ladder Fuels: Fuels that provide vertical continuity between the surface fuels and crown fuels in a forest stand, thus contributing to the ease of torching and crowning.

Landscape Level: A watershed, or series of interacting watersheds or other natural biophysical (ecological) units, within the larger Land and Resource Management Planning areas. This term is used for conservation planning and is not associated with visual landscape management and viewscape management.

Late Forest Succession: A stage of forest succession where the majority of trees are mature or over-mature.

Lopping and Scattering: Lopping the slash created after felling and spreading it more or less evenly over the ground.

Late and Old Structure (LOS): Late and old structural stages are defined by the Eastside Screens as multi-strata stands with large trees and single strata stands with large trees.

M

M – Thousand - Example: Five thousand = 5,000 = 5**M**

MBF – Thousand Board Feet

MM – Million – Example: Five million = 5,000,000 = 5**MM**

MMBF – Million Board Feet

Management Area (**MA):** An area of similar management goals and a common management prescription. Consists of a grouping of capability areas selected through evaluation procedures and used to locate decisions and resolve issues and concerns.

Management Concern: An issue or problem requiring resolution, or condition constraining management practices, identified by the interdisciplinary team.

Management Direction: A statement of multiple use and other goals and objectives, the management prescriptions, and the associated standards and guidelines for attaining them.

Management Indicator Species (MIS): A wildlife species whose population will indicate the health of the ecosystem in which it lives and, consequently, the effects of forest management activities to that ecosystem. MIS species are selected by land management agencies. Also see indicator species.

Mitigation: Actions taken to avoid, minimize, or rectify the impact of a land management practice.

Monitoring: The periodic evaluation on a sample basis of Forest Plan management practices to determine how well objectives have been met and how closely management standards have been applied.

Mechanical Shrub Treatment (MST): Use of mechanized equipment to mow, cut, chop, grind or otherwise reduce shrub or ground fuel vertical structure. Equipment and attachments would be chosen based on soils (compaction and displacement potential), terrain, other resource concerns, cost and availability.

N

National Environmental Policy Act (NEPA) - An act to declare a national policy which encourage productive and enjoyable harmony between man and his environment, to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man, to enrich the understanding of the ecological systems and natural resources important to the nation and to establish a Council on Environmental Quality.

National Forest Management Act (NFMA): A law passed in 1976, as amendments to the Forest and Rangeland Renewable Resources Act, that requires the preparation of regulations to guide resource development.

National Forest System Lands: National Forests, National Grasslands, and other related lands for which the Forest Service is assigned administrative responsibility.

National Register of Historic Places: A listing (maintained by the U.S. National Park Service) of areas which have been designated as being of historic significance. The Register includes places of local and state significance as well as those of value to the nation as a whole.

Natural disturbance regimes: The historic patterns (frequency and extent) of fire, insects, wind, landslides and other natural processes in an area.

Natural regeneration: The renewal of a forest stand by natural seeding, sprouting, suckering, or layering seeds may be deposited by wind, birds or mammals.

Non-forest Land: Land not primarily intended for growing or supporting a forest.

No-Action Alternative: The most likely condition expected to exist in the future if current management direction would continue unchanged.

No Impact: Proposed activities would not have any direct or indirect effects on individuals or natural habitat

O

Objective: A specific statement of measurable results to be achieved within a stated time period. Objectives reflect alternative mixes of all outputs or achievements which can be attained at a given budget level. Objectives may be expressed as a range of outputs.

Off Highway Vehicle (OHV): Any Class I (three wheelers, four wheelers), Class II (4x4s, jeeps), Class III (motorcycles) as defined by the State of Oregon. Class I and Class III are considered All-Terrain Vehicles (ATVs).

Old-growth Attributes: Structural features and other characteristics of old-growth forests, including: large trees for the species and site; wide variation in tree sizes and spacing; accumulations of large dead standing and fallen trees; multiple canopy layers; canopy gaps and understory patchiness; elements of decay such as broken or deformed tops or trunks and root decay; and the presence of species characteristic of old growth.

Overstory: That portion of the trees in a forest of more than one story forming the upper or uppermost canopy layer.

P

Plant Association Group (PAG): combine plant associations by climax species, site potential, and temperature and moisture similarities.

Potential Natural Community (PNC): The biotic community that would be established and maintained over time under present environmental conditions, if succession was completed without additional human-caused disturbances.

Post-fledgling Area (PFA): The area of concentrated use by the goshawk family after the young leave their nest. The desired area is approximately 420 acres.

Pre-commercial thinning (PCT): Removing some of the trees from a stand that are too small to be sold for lumber or house logs, so the remaining trees will grow faster. Also referred to as non-commercial thinning.

Preferred Alternative: The alternative recommended for implementation as the Forest Plan based on the evaluation completed in the Planning process.

Prescribed burning: the knowledgeable application of fire to a specific unit of land to meet predetermined resource management objectives.

Proposed Action: In terms of the National Environmental Policy Act, the project, activity, or decision that a Federal agency intends to implement or undertake which is the subject of an environmental assessment or environmental impact statement.

Prescribed Fire: Fire set intentionally in wildland fuels under prescribed conditions and circumstances. Prescribed fire can rejuvenate forage for livestock and wildlife or prepare sites for natural regeneration of trees.

Prescription: Management practices selected to accomplish specific land and resource management objectives.

R

Release Cutting: Removal of competing vegetation to allow a desired tree species to grow.

S

Scenery Management system (SMS): Describe objectives for scenic resources and visual quality. Incorporates an understanding of both natural and human processes that have occurred over time

Sensitive Species: Those species which (1) have appeared in the Federal Register as nominations or proposals for classification and are under consideration for official listing as endangered or threatened species, or (2) are recognized by the Regional Forester to need special management to prevent the need for their replacement on Federal or State lists.

Seral: The plant and animal community which is the transitional stage of succession. If left alone, the **seral stage** will pass, and another plant and animal community will replace it. Aspen represents a **seral stage** that would eventually be replaced by conifers such as spruce.

Silviculture Prescription: A site-specific operational plan that describes the forest management objectives for an area. It prescribes the method for harvesting the existing forest stand, and a series of silviculture treatments that will be carried out to establish a free growing stand in a manner that accommodates other resource values as identified.

Slash: The residual vegetation left on the ground after felling and other silvicultural operations.

Snag: A standing dead tree.

Stand: A community of trees sufficiently uniform in species composition, age, arrangement, and condition to be distinguishable as a group from the forest or other growth on the adjoining area, and thus forming a silviculture or management entity.

Stand Density: A relative measure of the amount of stocking on a forest area. Often described in terms of stems per acre, basal area, or stand density index.

Stand Structure: The distribution of trees in a stand, which can be described by species, vertical or horizontal spatial patterns, size of trees or tree parts, age, or a combination of these.

Suppressed Trees: Trees or shrubs with crowns receiving no direct light either from above or from the sides, and that will not respond to release. Usually crowns are entirely below the general level of the canopy.

T

Temporary Road: A road built for the singular purpose of removing forest products from a treated stand. After use, such roads are closed.

Thinning: A cutting made primarily in an immature stand of trees to accelerate growth of the remaining trees or to improve the form of the remaining trees.

Threatened Species: Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range and which has been designated in the Federal Register by the Secretary of the Interior as a threatened species.

Tractor Logging: A logging method using tractors to carry or drag logs from the stump to a collection point.

Treatments: Any planned manipulation of plant materials. Prescribed burning, thinning, logging, lopping are all examples of vegetation treatments.

U

Underburning (UB): Use of prescribed fire under a stand of trees to decrease or remove accumulated ground fuels during periods of spring like moisture to reduce risk of wildfire

Understory - Any plants growing under the canopy formed by other plants, particularly herbaceous and shrub vegetation under a tree canopy.

W

Watershed: The entire region drained by a waterway (or into a lake or reservoir. More specifically, a watershed is an area of land above a given point on a stream that contributes water to the streamflow at that point. A land area which collects and discharges excess surface water through a single outlet.

Winter Range Habitat Unit (WRHU): Areas in the biological winter range of mule deer ranging from 15,000 to 20,000 acres.

Wildland/Urban Interface (WUI): The property line between Forest Service and private lands.

Wildlife: All non-domesticated mammals, birds, reptiles, and amphibians living within a natural environment, and include both game species and non-game species. Animals, or their progeny, which one were domesticated but escaped captivity and are running wild (i.e., feral animals), such as horses, burros, and hogs, are not considered wildlife.

Wildlife Habitat Diversity: The distribution and abundance of different plant and animal communities and species within a specified area.

Y

Yarding: Moving the cut trees from where they fell to a centralized place (landing) for hauling away from the stand.

Yarding Tops Attached: This refers to hauling the tops and limbs left attached to the last log of each tree as it is yarded to the landing for processing and is done to reduce accumulations of logging fuels within the harvest unit

BIBLIOGRAPHY

Bibliography

Agee, J.K. 1993. Fire Ecology of the Pacific Northwest Forests. Washington, D.C. Island Press.

Albini, Frank A. 1976. Estimating Wildfire Behavior and Effects. USDA Forest Service. General Technical Report-INT-30.

Andrews, Patricia L. 1986. BEHAVE: Fire behavior prediction and fuel modeling system--BURN subsystem Part 1. USDA Forest Service. General Technical Report-INT-194.

Graham, Russel T., Alan E. Harvey, Martin F. Jurgensen, Theresa B. Jain, Jonalea R. Tonn, Deborah S. Page-Dumroese. 1994. Managing Coarse Woody Debris in Forests of the Rocky Mountains. USDA Forest Service. Research Paper INT-RP-477, 1-13.

Johnson, David H. and T. A. O'Neil. 2001. Wildlife-Habitat Relationships in Oregon and Washington. Oregon State University Press. Corvallis, OR.

McNabb, D.H., Froehlich, H.A., 1983. Conceptual Model for Predicting Forest Productivity Losses from Soil Compaction.

Miller, Richard E. 2001. Managing western juniper for wildlife. A Woodland Fish and Wildlife Project Publication. Washington State University Cooperative Extension. 8 pages.

O'Hara, K.L., P.A. Latham, P.F. Hessburg, et al. 1996. A Structural Classification of Inland Northwest Forest Vegetation. Western Journal of Applied Forestry. 11(3): 97-102.

Paige, C., and S.A. Ritter. 1999. Birds in a Sagebrush Sea – Managing Sagebrush Habitats for Bird Communities. Partners in Flight Western Working Group. Boise, ID.

Rothermel, Richard C. 1972. A mathematical model for fire spread predictions in wildland fuels. USDA Forest Service Research Paper INT-115.

Thomas, J.W. et al. 1979. Wildlife Habitats in Managed Forests, the Blue Mountains of Oregon and Washington. Agriculture Handbook No. 553. USDA Forest Service, 512 pages.

USDA Forest Service. 1991. Forest Service Handbook 2090.11, Washington Office Amendment Chapter 1. Ecosystem Classification. 5pages.

USDA Forest Service. 1995. Landscape Aesthetics: A Handbook for Scenery Management. Agriculture Handbook Number 701.

USDA Forest Service. 1995. Revised Environmental Assessment for the Continuation of the Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales (Regional Foresters Amendment #2).

USDA Forest Service. 1996, 1997 and 1999. Soil Monitoring Reports. Deschutes National Forest, Pacific Northwest Region.

USDA Forest Service. 1998. Deschutes National Forest Noxious Weed Control Environmental Assessment.

Vander Wall, Stephen B. 1994. Seed Fate Pathways of Antelope Bitterbrush: Dispersal By Seed-Caching Yellow Pine Chipmunks. Ecology 75 (7).

Volland, Leonard A. 1988. Plant Associations of the Central Oregon Pumice Zone. USDA Forest Service, Pacific Northwest Region.