Biological Evaluation/Assessment for PETS Species
that may occur in or would be affected by the

SILVIES CANYON WATERSHED RESTORATION PROJECT

Malheur National Forest
Emigrant Creek Ranger District

Table 1. Summary of Conclusion of Effects
(Rationale for conclusion of effects is contained in the body of this document)

Species	**No Action** (Alternative 1)	Proposed Action (Alternative 2)	Alternative 3	Preferred Alternative and Alternatives 4 and 7a	Alternative 5	Alternative 6
gray wolf (**T**)	NE	NE	NE	NE	NE	NE
bald eagle (**T**) - Nesting	NE	NLAA	NLAA	NLAA	NLAA	NLAA
bald eagle (**T**) – potential roosting	NE	NE	NE/BE	NE/BE (NE-7a)	NE/BE	NE/BE
lynx (**T**)	NE	NE	NE	NE	NE	NE
wolverine (**S**)	NI	NI	NI	NI	NI	NI
pygmy rabbit (**S**)	NI	NI	NI	NI	NI	NI
peregrine falcon (**S**)	NI	NI	NI	NI	NI	NI
western sage grouse (**S**)	NI	MIIH	MIIH	MIIH	MIIH	MIIH
gray flycatcher (**S**)	NI	MIIH	MIIH	MIIH	MIIH	MIIH
bufflehead (**S**)	NI	NI	NI	NI	NI	NI
redband trout (**S**)	NI (MIIH)	MIIH (BI)	MIIH (BI)	MIIH (BI)	MIIH (BI)	MIIH (BI)
Malheur mottled sculpin (**S**)	NI (MIIH)	MIIH (BI)	MIIH (BI)	MIIH (BI)	MIIH (BI)	MIIH (BI)
Columbia spotted frog (**S**)	NI	MIIH	MIIH	MIIH	MIIH	MIIH
crenulate moonwort (**S**)	NI	NI	NI	NI	NI	NI
Deschutes milkvetch (**S**)	NI	MIIH	MIIH	MIIH	MIIH	MIIH
Raven's lomatium (**S**)	NI	NI	NI	NI	NI	NI

P = Proposed, E = Endangered, T = Threatened, S = Sensitive
NE =No Effect, NLAA =May Effect, Not Likely to Adversely Affect, LAA =May Effect, Likely to Adversely Affect, BE =Beneficial Effect, NI =No Impact, MIIH =May Impact Individuals or Habitat, but Will Not Likely Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species, (Effects in parentheses are longt term effects; definitions of effects determinations provided in Appendix A)

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I. Introduction

This combined BE (Biological Evaluation)/BA (Biological Assessment) analyzes the potential effects of the proposed action and alternatives developed for the Silvies Canyon Watershed Restoration Project, which are fully described in the FEIS Chapter 2. Effects on PET (Proposed, Endangered, or Threatened) species listed under ESA (Endangered Species Act, as amended) and those species identified as sensitive by the FS (United States Department of Agriculture-Forest Service) that do or may occur in the project area would be considered (Appendix B) as required by FSM (Forest Service Manual) 2672.42.

PET species considered include:

those that are known to occur within the planning area,
those that are likely to occur within the planning area, based on the distribution of the species, the habitat conditions required or used by the species, and the current habitat conditions of the planning area,

- those that could be affected by management actions, due to known species occurrence adjacent to, or immediately downstream from the planning area.

The BE includes documentation of how PETS (proposed, endangered, threatened, or sensitive) species were identified for, or excluded from, the effects analysis.

The following sources were reviewed during a prefield data base review to gather evidence of or potential for PETS and/or their habitats to occur within the area of the proposed project or action:

Current Regional Forester's (R6) Sensitive Plant and Animal Lists
Malheur National Forest and Burns Ranger District PETS Species Database

- Burns District WildObs Database
- Oregon Department of Fish and Wildlife
- Oregon State University, Department of Fish and Wildlife
- ORNHP (Oregon National Heritage Program) Database records
- District Stream Surveys

Current and historical species distribution maps
Site-specific habitat present within the analysis area that is suitable or may be potential habitat
Sensitive Plants of the Malheur, Ochoco, Umatilla, and Wallowa-Whitman National Forests

In addition, field reconnaissance was conducted to:

- Assess the project area to identify potential PETS habitat
- Search suitable habitat for PETS species occurrence (if present)
- Confirm known habitat is suitable (if present)
- Refine knowledge of how habitat exists on the landscape and how species use their habitat

Field reconnaissance to determine the presence of PETS was conducted from 1992-2002.

This combined BE/BA is prepared to satisfy the requirements of FSM 2672.42. This requires the Forest Service to review all its planned, funded, executed, or permitted programs and activities for possible effects (beneficial, adverse, or lack of effects) on PETS species.

The BE/BA process is intended to review proposed Forest Service programs or activities in sufficient detail to determine how an action or proposed action may affect PETS species and to ensure that proposed management actions would not:

jeopardize the continued existence, or cause adverse modification of habitat, for species listed or proposed to be listed as endangered or threatened by the FWS (United States Department of the Interior-Fish and Wildlife Service) (FSM 2672.41) or; contribute to the loss of viability for species listed as sensitive by FS-Region 6, or any native or desired non-native species; nor cause any species to move toward federal listing (FSM 2672.41).

This process is conducted to provide a standard by which to ensure that threatened, endangered, proposed, and sensitive species receive full consideration in the decision making process.

II. Summary of Alternatives

The project area is located on the west side of the Emigrant Creek Ranger District and is comprised of Boulder Creek/ Fawn Creek, Burnt Mountain, Myrtle Creek, Myrtle Park, Red Hill, Sage Hen Creek, and Stancliff Creek subwatersheds (6th level HUC) which make up the Silvies Canyon Watershed (5th level HUC). All the drainages flow off the forest and into the Harney Malheur Lakes subbasin. Table 2. provides the legal description of the project area.

Table 2. Project Area Location by Township/Range/Section.

Township	Range	Section
18 S	29 E	1, 12-13, 24-26, 36
18 S	30 E	6-7, 13-36
18 S	31 E	30-32
19 S	30 E	1-36
19 S	31 E	5-24, 26-35
20 S	30 E	1-5, 9-15
20 S	31 E	2-11, 15-18, 20-22

The project area contains about 65,000 acres of National Forest lands. Some private land occurs within project area boundary.

All acres listed herein are approximate. In most cases, units or stands have been delineated using the most up to date information available and acreages have been determined through computer analysis. Acreages are considered approximate until actually verified on the ground.

The alternatives described in the Silvies Canyon Watershed FEIS (Final Environmental Impact Statement) were developed by the interdisciplinary team in response to the issues that were brought up during project scoping. Eight alternatives are considered in detail: the No Action (Alternative 1), the Proposed Action (Alternative 2), the Preferred Alternative (Alternative 7) and five other alternatives.

See Chapter 2 of the FEIS for a complete description of alternatives. Project area maps, and foldout maps of all alternatives considered in detail are provided in the FEIS. Large-scale maps are also available in the project planning record. Appropriate mitigation measures have been developed as needed for the action alternatives.

III. Species Considered

Table 3. Federally listed species (documented or suspected to occur in the project area, or otherwise impacted by actions taken) considered.

Species	Effects Determination	Informal Consultation	Biological Assessment	USFWS Concurrence Biological Opinion
gray wolf (**T**)	**No Effect**	**NO**	**NO**	**N/A**
bald eagle (**T**)	**May Effect**	**YES**	**YES**	**YES, 9/26/01**
lynx (**T**)	**No Effect**	**NO**	**NO**	**N/A**

Table 4. Federally listed and proposed endangered and threatened species that may occur within the Malheur National Forest but are NOT present in the project area

Species	DPS/ESU (fish)
bull trout (**T**)	Columbia River DPS
summer steelhead (**T**)/critical habitat	mid-Columbia ESU

Table 5. Sensitive species (documented or suspected to occur in the project area, or otherwise impacted by actions taken) considered.

Animals	Fish	Invertebrates	Plants
wolverine pygmy rabbit peregrine falcon western sage grouse gray flycatcher bufflehead Columbia spotted frog	redband trout Malheur mottled sculpin	Blue Mountain crypotochian caddisfly	crenulate moonwort Deschutes milkvetch Raven's lomatium

Table 6. Sensitive species that may occur within the Malheur National Forest but are NOT present in the project area.

Species
tri-colored blackbird
upland sandpiper
bobolink

See Appendix B for full list of PETS found or suspected to occur on the Emigrant Creek Ranger District.

IV. Potential Effects on Listed and Proposed Species and Critical Habitat

Gray wolf
(*Canis lupus*) Linnaeus 1758

Status

Federal Status: Threatened (Fed. Reg. Vol. 68, #62, pp. 15804-15875). The northern Rocky Mountain gray wolf was listed as endangered on June 4, 1973, and a recovery plan was released in 1987. The USDI Fish and Wildlife Service published a final rule changing the status of northern Rocky Mountain gray wolf to threatened on April 1, 2003. USDA-Forest Service (Region 6) Status: Threatened
State Status: Endangered (last revised 12/1998) Oregon Natural Heritage Program Status: List 2-extirpated (ORNHP 2000)

Conservation Status Ranking
(The Association for Biodiversity Information 2000)

Global Rank= G4 (November 15, 1996)
National Rank=N4 (September 05, 1996)
Oregon State Rank=SX (presumed extirpated)

(Status definitions included in Appendix C)

Major Threats

Human-caused mortality is the major factor limiting the recovery of wolves with the majority of losses due to shooting, trapping and vehicle accidents. In addition, wolves, particularly juveniles, are susceptible to canine parvovirus and distemper.

This species is negatively affected by roads. Roads increase human presence in wolf habitat and increase the likelihood of negative contacts. A disproportionate number of human-caused mortalities occur near roads. These mortalities are

mostly legal and illegal shooting resulting from human access provided by roads. Vehicle collisions account for additional mortalities.

"Thurber and others (1994) cite three studies (Jensen and others 1986, Mech and others 1988, Thiel 1985) indicating wolf packs would not persist where road densities exceeded about 1.0 mi/mi^2." (Wisdom et al. 2000).

Population Status and Trend

Currently there are experimental populations of gray wolves established in Idaho and Montana. There are no known wolf packs in Oregon but dispersing wolves could become established in remote areas within the state. There are no known populations on the Malheur National Forest.

Source Habitat Trend

Source habitats span a broad elevational range and include all terrestrial community groups except exotic herblands and agriculture (Wisdom et al. 2000).

Source habitats for gray wolf likely occurred throughout the basin historically. The current extent of habitat, albeit largely unoccupied, is similar to the historical distribution except for the Columbia Plateau, Lower Clark Fork, and Upper Clark Forks ERUs, where habitat is more patchily distributed than it was historically.

The overall trend in source habitats across the basin was neutral.

Existing Condition

Historically, wolves occupied all habitats on this Forest (Wisdom et al. 2000), but are currently considered extirpated.

In 1999, a collared wolf (B-45-F) from the experimental, non-essential Idaho population traveled to the Malheur, Wallowa-Whitman, and Umatilla National Forests and stayed until it was captured and returned to Idaho. In 2000, at least two wolves were killed in Oregon, one wolf was found dead near Baker City and one was shot illegally near Ukiah, Oregon.

This indicates that the Malheur, Wallowa-Whitman, and Umatilla Forests are probably suitable habitat for wolves. Over time, wolves dispersing from the growing experimental, non-essential central Idaho wolf population could return to the Blue Mountains and establish packs.

Big game (ungulates) are an important source of year-round prey for wolves. Wolves are limited by prey availability and are threatened by negative interactions with humans. Generally, land management activities are compatible with wolf protection and recovery, especially actions that manage ungulate populations to prevent large changes in the populations. Habitat and disturbance effects are of concern in denning and rendezvous areas. No habitat is currently occupied in Oregon.

Effects and Determination

Direct and Indirect Effects
Alternative 1, No Action, maintains existing big-game habitat and open road densities. Existing big-game populations provide an adequate prey base for individual wolves or packs should they occupy the area in the future. Wolf/human interactions usually increase with increased road density. Road densities in the Silvies Canyon Watershed range from over 5 miles per square mile in the Myrtle Creek subwatershed to just under 3 miles per square mile in the Boulder/Fawn subwatershed. Because unroaded areas provide the best habitat for wolves, densities in this watershed result in degraded wolf habitat. Road densities and big-game habitat would not change with this alternative.

Cumulative Effects
Ongoing activities, such as livestock grazing, would continue in the project area. While grazing can reduce ground vegetation and shrubs and has the potential to impact riparian habitat, grazing would not be expected to contribute to cumulative effects on wolves. Alternative 1 would maintain adequate wolf prey species in the short-term; however, elk habitat quality could be reduced in the foreseeable future when stand-replacing events (such as a fire or insect outbreak) remove available cover. The likelihood of such events is higher in Alternative 1 than in the action alternatives.

Determination

Due to the nature of the no action alternative, and the fact that there are no wolf populations currently occupying the Malheur National Forest and no denning or rendezvous sites on the Malheur National Forest, there would be **No Effect (NE)**. There are potential indirect, long-term effects from potential large-scale insect and disease outbreaks

infestation and catastrophic wildfire that could occur because of not addressing current forest heath issues. The magnitude and timing of these potential impacts are unknown, but they could drastically modify potential wolf and big game habitat conditions for many years to come.

Alternatives 2, 4, 7, and 7a reduce big-game cover on summer range in all subwatersheds and reduces cover on winter range in all subwatersheds except Red Hill and Stancliffe Creek. Alternative 5 reduces big-game cover on summer range in all except the Boulder/Fawn and Red Hill subwatersheds and reduces cover on winter range in all subwatersheds except Stancliffe Creek. Although cover is being reduced, habitat effectiveness improves in these alternatives on both summer and winter range due to road closures. Big-game animals might move from an area during treatments, but they are expected to return upon completion. Although cover is being reduced, the effect on big-game populations is not expected to be measurable; therefore, adequate prey should remain in the watershed to provide forage for wolves. Under Alternatives 3 and 6 thermal cover would remain at existing levels and overall habitat effectiveness would increase for elk; adequate prey would remain available under these alternatives.

Road closures will increase seclusion habitat and reduce the potential for wolf/human interactions in all action alternatives. Other proposed activities (such as old-growth reconfiguration, spring restoration, juniper reduction, weed treatment, and aspen restoration) would have no measurable effect on wolves or their habitat.

Cumulative Effects
All alternatives would be expected to maintain adequate wolf prey species, despite the potential for cumulative effects to elk. Proposed activities should not contribute to cumulative effects on wolves.

The determination for all action alternatives is **No Effect (NE)** for the following reasons:

There is an abundance of prey on the forest and timber, fuel management, and other proposed actions (juniper reduction, aspen restoration) are not expected to affect big game populations measurably; therefore prey availability is not a limiting factor.

No wolf populations currently occupy the Malheur National Forest.

No denning or rendezvous sites have been identified on the Malheur National Forest.

Road closures will increase seclusion habitat and reduce the potential for wolf/human interactions.

Most management activities for non-breeding populations are compatible with wolf protection and recovery.

bald eagle

(Haliaeetus leucocephaslus)
Linneaus 1766

Effects of proposed actions on bald eagles and their nesting and roosting habitat are discussed in the Biological Assessment (BA) for the Silvies Canyon Watershed Restoration Project (Wildlife Project Record).

The BA and associated Biological Opinion (9/26/01) analyzed and concurred on the effects of commercially thinning 29 acres and precommercially thinning 144 acres as well as prescribed burning these acres within the Bald Eagle Management Area (BEMA). The BA and BO also considered and concurred on the effects of precommercial thinning and burning of slash on 729 acres of potential winter roost habitat and effects of thinning, burning, roads, and other treatments as described in Alternative 7 in areas outside of bald eagle habitat.
Alternatives 2 and 5 treat bald eagle nesting habitat in the manner described in the BA/consultation. Therefore, the effects from the BA/consultation of Alternatives 2 and 5 on nesting bald eagles and nesting habitat are repeated below and used as a comparison for other alternative effects. Alternatives 3, 4, 5, 6, and 7 treat potential roosting stands the same as described in the BA/consultation. Those effects from the BA are summarized below. The effects of no action (Alternative 1) and of varied treatment within nesting habitat (Alternatives 3, 4, 6, 7, and 7a), and no action or limited action on potential roosting habitat (Alternatives 1, 2, and 7a) have been added here.

Status

Federal Status: Threatened (list 1-7-00-SP-588) Federal status is categorized by state/region, rather than by subspecies.
USDA-Forest Service (Region 6) Status: Threatened
State Status: Listed as a Threatened Species (last revised 12/1998)
Oregon Natural Heritage Program Status: List 1- contains taxa that are threatened with extinction or presumed to be extinct throughout their entire range. (ORNHP 2000)

Conservation Status Ranking

(NatureServe 2000)
Global Rank = Apparently Secure-Uncommon but not rare, and usually widespread. Possibly, cause for long-term concern. Typically more than 1000 occurrences and more than 10,000 individuals. (November 22, 1966)
National Rank = Apparently Secure-Uncommon but not rare, and usually widespread (January 05, 1997)
Oregon State Rank = Vulnerable in Oregon either because rare and uncommon, or found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically 21 to 1000 occurrences. (ORNHP 2000)

Degree of Fragility

Fairly resistant. enerally susceptible to human intrusion, but "show a high degree of adaptability and tolerance if the human activity is not directed toward them". Chronic disturbance results in disuse of areas by eagles. (NatureServe 2000)

Species Abundance and Distribution

The bald eagle is the only North American representative of the fish and sea eagles (Grossman and Hamlet 1964, Brown and Amadon 1968), and is endemic to North America.

1. Pacific Population

a. Condition and Trend of the Pacific Population

In Oregon and Washington, breeding populations are still widely distributed, but historical information suggests significant declines and changes in distribution (USDI 1986). Oregon has the second highest population of nesting bald eagles in the Pacific Northwest recovery area. By 1999, breeding pairs occupied 376 of 391 surveyed traditional nesting territories (Isaacs and Anthony 1999). Isaacs and Anthony (1999) report recovery population goals were met or exceeded in 8 (Recovery Zone 9,10,11,12,13,21,22, and 23) of 10 (80%) Recovery Zones in Oregon.

b. Habitat

Summer/Nesting

Bald eagle nests in the Pacific recovery area are usually in large trees located in uneven-aged (multi-storied) stands with old-growth components (Anthony et al. 1982) and are near water bodies, which support an adequate food supply. Most nests in Oregon, Washington and California are located in predominantly coniferous stands.

Winter

This species preferentially roosts in conifers or other sheltered sites in winter and typically selects larger, accessible trees in second growth stands with large trees or old growth. At preferred communal roost sites, bald eagle use occurs in successive years. Winter roost sites vary in their proximity to food resources (up to 20 miles) but are typically located near an abundant food source (Isaacs et al. 1993).

Existing Condition

Currently, there is one known active bald eagle nest (Silvies River Nest Site #807-009) in the project area. The nest tree is situated in a mature ponderosa pine stand along the Silvies River as it enters the Malheur National Forest, southwest of the Silvies Valley.

There are two potential winter roost sites in the project area, the 482-acre Silvies River and the 277-acre Myrtle Creek potential winter roost sites. These roosts are located in the Silvies River Watershed approximately seven air miles southwest of the nest/ Bald Eagle Management Area (BEMA).

By the 1900s, a variety of activities including grazing, commercial trapping, logging, irrigation, road construction, recreation, predator control, introduced fish and wildlife species and fire suppression have influenced the ecology and biological processes functioning in the area. Stands immediately adjacent to the nest site exhibit only limited impacts from anthropogenic use.

Effects and Determination

Alternative 1 (No Action)
Under the No Action Alternative, there would be no management activities; therefore, there should be no direct effects to bald eagles or bald eagle habitat. Bald eagle potential roosts have no known use reported and important nesting and roosting structural characteristics would be retained at current levels.

However, an indirect effect of no action on nest habitat and potential roosts is an expected decline in habitat suitability, as reflected by shifts in species composition, loss of large tree structure and increased fire risk.

The forested stands in bald eagle habitat are identified as moderate to high risk for stocking induced mortality, related infestation of pests or disease, and loss of stand characteristics through stand-replacing events such as wildfire. Without silvicultural treatment or the controlled re-introduction of fire into the project area, current stand conditions would progress from dense understories to even denser understories with continued tree species conversion and increased competition for water. The expected result is forest with decreasing vigor, increasing mortality, and a higher probability of stand-replacing events.

Cumulative Effects

Livestock grazing is the principal activity that occurs on federally administered and private lands in the BEMA (Bald Eagle Management Area). Historically, commercial timber harvest has occurred in the BEMA and would occur in the future to manage for healthy, resilient forest stands. Road construction has occurred in relation to timber harvest. One seasonally closed (closed January 1 through August 31) road exists adjacent to the stand containing the nest site. A Categorical Exclusion signed in 1998 permitted the 44-acre stand around the bald eagle nest to be precommercially thinned, hand-piled, and burned in an effort to protect and enhance bald eagle habitat. This stand was thinned and piled between 1999 and 2001. Most piles still need to be burned. These activities have likely improved forest health and slightly reduced the risk to stand-replacing events in this stand. These activities provide a small amount of improved habitat for eagles. Overall cumulative effects on bald eagle are minimal.

Determination

Due the nature of the No-action Alternative, there would be **No Effect (NE)** to nesting bald eagles, bald eagle nest habitat, or potential roosting habitat. However, there are potential indirect, long-term effects to habitat from probable high intensity wildfire that could occur because of not creating resilient forest ecosystems. The magnitude and timing of this potential impact is unknown, but it could drastically modify nest and roost stands and could remove nest and roost trees.

Effects on Nesting and Nesting Habitat

Alternatives 2 and 5

To improve stand vigor, manage stand structure, and improve or maintain overall long-term stand cover, commercial (29 ac. near the nesting stand) and precommercial thinning (144 acres near the nesting stand) and prescribed burning (1,100 acres-most outside the Bald Eagle Management Area) would focus mainly on the removal of excess trees from mid-story and lower tree canopies. After treatment, the residual stand structure should become more vigorous as competition from the understory is reduced. This would make these stands more stable over time as the remaining trees become increasingly resilient to the effects of pathogens, drought and fire. The risk of stand loss due to these factors may be reduced.

No management activities (including harvest and prescribed burning) would occur within 1 mile of the nest when the nest site is in use. Mitigation measures for treatments would be the same as in the other action alternatives.

Based on the above mitigation, there would be no direct effect to bald eagles or habitat used for breeding. The following may indirectly affect bald eagles by affecting forest habitat adjacent to the nest stand.

Reduction in Canopy Closure:
There would be a slight reduction in canopy closure following precommercial thinning due to the removal of suppressed understory trees and intermediate trees. The canopy closure should be reduced by an estimated 5-10%.

Canopy reduction in the commercially thinned stands would be greater (reduced by 10%-20%) because more trees would be removed from the lower canopy layer.

This change in canopy closure may also result in a slight increase in ambient and ground temperature as more light is allowed through the canopy.

The slight reduction in canopy closure following thinning would not alter the overall appearance or function of these stands or effect the overstory trees in stands adjacent to the bald eagle nest stand.

Increased Stand Vigor:
The residual stand should become more vigorous as competition from the understory is reduced. This would make these adjacent stands more resilient to the effects of pathogens, drought and fire. The risk of stand loss due to these factors may be reduced. This in turn, would reduce the likelihood of stand replacement fires or insect outbreaks originating in these stands and spreading to the nest stands.

Fuel treatments would result in an overall reduction of fuel levels (approximately 80% consumed during multiple burns with an objective of 50% consumed during the first stage) throughout forested stands adjacent to the nest site. This would reduce the risk of a stand-replacing fire originating from these stands and spreading to the nest stand.

As some suppressed understory trees are consumed by fire, small openings in the canopy should develop. These small openings in existing stand canopies should create optimal growing conditions for natural regeneration of tree seedlings and forage species. This should promote the development of sustainable stand structure over time.

Through the removal of smaller diameter dead and dying trees from the understory, ladder fuels that are capable of carrying a ground fire into the canopy would be reduced. Hand piled activity generated slash would be burned. Some fire creep is expected between piles depending on concentration of natural fuels and fall/winter burning conditions. This treatment would result in an overall reduction of fuel levels throughout the stand and would reduce the risk of a stand-replacing fire.

No snags or down wood would be actively treated as part of the fuels reduction prescription. Regional direction for retention of snags and down wood would be applied to retain this habitat for primary cavity excavators, secondary cavity users and other wildlife that uses this habitat.

Pile burning and ground creep would potentially pose a risk to the stand if the fire burned out of prescription. Some tree mortality could occur to shade tolerant trees if fire intensity increased above a low intensity ground fire. Stands to be treated in this project are from 1/10 to ½ mile away from the nest

While there are risks of fire damage to overstory trees during prescribed fires, such risks would be minimized by prior thinning of ladder fuels

Low to moderate intensity ground fires would likely prune conifers to 4 to 6 feet above the ground. This would contribute to the effects on canopy cover and understory structure.

Cumulative Effects

Cumulative effects would be similar to those described in Alternative 1. Prescribed treatments combined with past thinning of 44 acres around the nest will cumulatively improve habitat conditions and improve resiliency of the BEMA. Cumulative effects would be simialr for the remaining action alternatives.

Determination

The effects on stand structure resulting from commercial and pre-commercial thinning, piling and burning are fairly predictable, but how this may effect bald eagles use of the area is more difficult to predict.

Recently completed vegetation management activities within the Silvies River nest stand appear to have had no adverse effect on the eagles that use the area. In 1999 and 2000, the Silvies River eagle pair successfully reared one young each year. This indicates that this pair was not adversely affected by stand level precommercial thinning in the nest stand. Similar treatments in stands adjacent to the nest stand should have no greater affect on nesting bald eagles as long as mitigation measures are properly applied.

There are inherent risks whenever forest structure is altered and when fire is used in an uncontrolled setting. Timing of entry and careful use of fire would limit the risk to a very low level. How the eagles may respond to altered habitat adjacent to the nest stand still remains an uncertain. Because of the uncertainty of management activities in an uncontrolled setting, there still remains some short-term risk; therefore, these actions **May Effect-Not Likely to Adversely Affect (NLAA)** bald eagles or

their nesting habitat.

Alternatives 3 and 6
These alternatives would do only precommercial thinning inside and outside the BEMA. Precommercial treatment would somewhat reduce canopy closure and stand structure as described in Alternatives 2 and 5. Compared to no-action, stand vigor would increase and the probability of stand-replacing events would decrease, but the degree of improvement would be smaller than with Alternatives 2 and 5. Compared to Alternative 2 and 5, these alternatives would have less potential to impact bald eagles but would also provide less protection from fire and insects for a shorter period of time.

Determination
The overall effect to nest habitat would likely be similar to Alternatives 2 and 5, though the benefits of treatment would last for a shorter time. Implementation of these action alternatives **May Effect-Not Likely to Adversely Affect (NLAA)** nesting bald eagles or occupied nesting habitat.

Alternatives 4, 7, and 7a

These alternatives would commercially thin all acres (173 acres) proposed inside the BEMA. Canopy closure and stand structure would be reduced as described in Alternatives 2 and 5, though the extent of reduction would be greater than in those alternatives. Stand vigor would increase and the probability of stand-replacing events would decrease over a larger area than with Alternatives 2 and 5, but the potential to have negative impacts on nesting habitat could also increase. Since impacts in the BEMA would be greater in these alternatives than the actions consulted on, further consultation would be needed to implement the treatments in these alternatives in BEMA habitat.

Determination

The overall effect to nest habitat would likely be similar to Alternatives 2 and 5, though more commercial harvest occurs in Alternatives 4, 7, and 7a. Implementation of these action alternatives **May Effect-Not Likely To Adversely Affect (NLAA)** nesting bald eagles or occupied nesting habitat.

Effects on Roosting Habitat

Alternatives 3, 4, 5, 6, and 7

Use by eagles of potential roosts would be determined prior to implementation of silvicultural treatments or prescribed burning. If sites were active, any disturbing activities would be seasonally restricted from about November 15 to April 15 within and adjacent to roost sites.

Based on the above mitigation, there would be no direct effect to bald eagles or critical habitat. Bald eagles may be indirectly affected by affecting forest habitat within potential roosts.

The general effect of vegetation treatment on stand structure and composition within potential roost sites would be similar to that discussed in the above section. The method of treatment would be limited to precommercial hand felling of understory trees. To maximize the benefit of understory thinning while retaining key structural elements and maintain overall stand integrity, understory thinning would remove conifers up to 7 inch dbh.

The general effect of fuels management treatment on stand structure and composition within potential roost sites would be similar to that discussed in the above section. Prescribed burning would be limited to burning of hand piles of activity-generated slash piled after thinning operations. This treatment would limit fuels reductions of “new” slash only. Limited ground creep from burning piles would remove some accumulations of natural fuels but would not significantly reduce fuel loading in the potential roost stands. Fuel loading would remain relatively high but removal of much of the ladder fuels from the stands would reduce the risk of a ground fire moving up into the canopy.

Determination

These alternatives would have **No Effect (NE)** on bald eagles or their habitat in the short-term. This is because the Silvies River and Myrtle Creek roosts are not currently used by bald eagles and are considered unoccupied.

DellaSala et al. (1998) strongly recommend aggressively treating declining roosting habitat to preserve and improve stand characteristics important to roosting eagles. The proposed action attempts to do this in potential roosting sites with the hope that limited stand restoration treatments would increase the suitability and sustainability of these areas for future roosting. The result of this treatment should have a long-term **Beneficial Effect (BE)** on potential bald eagle winter roosting habitat.

Alternatives 2 and 7a

Mitigation measures for treatments would be the same as in the other action alternatives.

Thinning treatments would not occur in these alternatives, but burning would occur in the both potential roost sites in Alternative 2 and in the 277 acre Myrtle Creek potential roost in Alternative 7a. The effect would be a minor, short-term reduction in fuels with a subsequent reduction in the risk of a stand-replacing event. The overall effect to roost habitat would likely be similar to the No-action Alternative.

Determination

The effect to potential roost habitat is the same as the Alternative 1 (no action) – **No Effect (NE)** on bald eagles.

lynx

(Lynx canadensis) Kerr 1792

Status

Federal Status: Threatened (list 1-7-00-SP-588). On March 24, 2000, the USDI Fish and Wildlife Service published a final rule (50 CFR Part 17, RIN 1018-AF03) to list the contiguous U.S. distinct population segment of the Canada lynx, as threatened, pursuant to the Endangered Species Act of 1973, as amended. The listing became effective 30 days after publication of the final rule in the Federal Register (USDI-Fish and Wildlife Service 2000a).
USDA-Forest Service (Region 6) Status: Threatened
State Status: N/A
Oregon Natural Heritage Program Status: List 2

Conservation Status Ranking

(The Association for Biodiversity Information 2000)
Global Rank= G5 (Nov 19, 1996)
National Rank=N4 (Jan. 15, 1997)
Oregon State Rank=S1

Major Threats

Habitat loss, fragmentation and susceptibility to overharvest (trapping) are major concerns across its range (TNC 1999). Factors thought to be of concern include; forest management activities that drastically alter habitat, fire suppression, landscape level stand-replacing wildfire, roads, developments that destroy habitat, grazing, predator control and trapping, competition with other predators, and human disturbances (winter recreation off-highway travel and highways) that displace lynx from their habitat (Wisdom et al. 2000, TNC 1999, and Witmer et al. 1998). Stand-replacing wildfire has a short-term negative effect that is likely due to a reduction in snowshoe hare populations (Ruediger et al. 2000). Hare populations generally peak 15-30 years after a stand-replacing event in their habitat. Lynx habitat in the Rocky Mountains was dominated by stand-replacing fires or mixed severity first historically. These fires maintained lynx habitat by providing high quality habitat for snowshoe hare.

Population Status and Trend

Empirical data for distribution of lynx within the basin are scarce, and data on abundance of lynx populations are not available. McKelvey and others (1999) recently summarized all known lynx locations in the United States, which provides a framework for designing and conducting future surveys and demographic studies of lynx populations.

Source Habitat Trend

Basin-wide, source habitat was projected to have increased moderately or strongly in 47 percent of the watersheds. The Blue Mountains ERU has undergone a positive absolute (+26.93%) and relative (>100.00%) change in source habitat availability (moderate or strong increases in more than 50 percent of the watersheds). An increase in Blue Mountains source habitat was most influenced by an increase in mid and late-seral montane forests and mid-seral subalpine forests (Wisdom et al. 2000).

Distribution and Habitat

The lynx is found in the taiga zone of North America, from British Columbia east to Atlantic Coast of Canada. It ranges from Alaska south, except for the coastal areas, to isolated parts of Washington, Idaho, and Montana. The lynx is also found in central Utah and in a fraction of Colorado. Small populations might still exist in northern Minnesota, Wisconsin, and New Hampshire (U. S. Dept. Interior. Fish and Wildlife Service 1994). Its distribution probably has changed little from the historical except at the southern extent of its range (Koehler and Aubry 1994). The occurrence of the lynx in most of the contiguous United States is likely the result of

transient dispersal during declines in population density of their primary prey, snowshoe hares (Quinn and Parks 1987).

The lynx has always been rare in Oregon (Koehler and Aubry 1994). The few specimen records that exist are from the higher elevations of the Cascade Mountains and the Wallowa Mountains in northeastern Oregon. A lynx shot in Oregon in 1964 was the first record since 1935. One lynx was trapped near Drewsey, Oregon, in 1994.

General Description

Lynx are typically associated with large tracts of higher elevation boreal and coniferous forests that are often interspersed with rock outcrops, bogs and thickets. Key components of lynx habitat include denning, foraging, and travel corridors provided by a mosaic of forest habitats.

Home range size varies considerably and is usually dependent upon prey availability. Typical home range territories are 45-155 mi^2. Lynx habitat landtypes typically occur where low topographic relief creates continuous forest communities of varying ages (Ruggiero 1994). This species requires early successional forests that contain high numbers of prey for foraging, and late-successional forest that contain cover for kittens (especially deadfalls) and for denning. Intermediate successional stages may serve as travel cover, but function primarily to provide connectivity within a forested landscape. Lynx avoid large openings (> 330 feet from cover) that have the potential to disrupt movement between isolated populations (Ruggiero 1994).

Snowshoe hare (*Lepus americanus*) is a primary prey species (Quinn and Parker 1987). Other prey items used include small rodents, red squirrels (*Tamiasciurus hudsonicus*), grouse (*Bonasa umbellus* and *Dendrogapus* spp.) and ptarmigan (*Lagopus* spp.) (Hatler 1989, McCord and Cordoza 1982).

Lynx prefer early to mid-successional, densely stocked, mixed conifer forests created by natural or human-caused disturbances that support plentiful populations of hare for hunting (Ruggiero 1994). In general, these conditions are often preferred by snowshoe hare for cover. In Washington, hares were 4-5 times more abundant in 20-25 year old lodgepole pine (*Pinus contorta*) stands than older stands. In Montana, dense stand of early to mid-successional Douglas-fir (*Pseudotsuga mesziesii*) were most commonly used and in Colorado and Utah, dense stands of early to mid-successional subalpine fir (*Abies lasiocarpa*) and Engelmann spruce (*Picea engelmannii*) were preferentially selected.

Snowshoe hares also need large numbers of downed logs within these habitats for hiding cover and warren sites.

Lynx denning habitat is characterized as having large woody debris that provides security and thermal cover and mature overstory canopies. These combine to provide both vertical and horizontal structural diversity (Ruggiero 1994). Habitat quality, as measured by the availability of alternate den sites, appears to be an important factor in kitten survival when disturbance occurs. Den sites occur primarily on north to northeast aspect slopes (Ruggiero 1994). Primary denning sites are often in large hollow logs, beneath windfall or upturned roots, or in brush piles in dense thickets (Brittell et al. 1989).

Deep snow and cold temperatures are often associated with lynx habitat. Other predators, such as the wolverine, may need to migrate to lower elevations under these conditions in order to follow their food source. Lynx, however, remain and thrive under these conditions due to their physical adaptations to low temperatures, deep snow and ability to successfully hunt the snowshoe hare.

The third key component of lynx habitat is travel corridors that provide security during movement from denning areas to foraging areas and during dispersal. Travel corridors are characterized as having minimum stem density of at least 180 stems per acre that are over eight feet tall.

Local Description
(central Idaho, eastern Oregon and western Utah)

The Blue Mountains of Oregon, Idaho Batholith of central Idaho, Bitterroot Mountains of Montana and eastern Idaho, and mountains of Wyoming are included in this ecoprovince.

In central Idaho, lodgepole pine community types and habitat types are not widespread but do commonly appear on more gentle terrain, toe-slopes and valley bottoms wherever the species can dominate the site. Such stands usually grade into subalpine fir or Douglas-fir habitat types on adjacent steeper or higher slopes. After disturbances such as fire, these lodgepole pine communities often provide good quality lynx foraging habitat for several

decades.

The subalpine fir series occurs at upper elevations throughout most of central Idaho. Large stands of fire-induced lodgepole pine commonly dominate much of this series and, especially when interspersed with unburned islands of subalpine fir, often provide very good quality lynx habitat. Under growth is variable and ranges from tall shrub layers of blue huckleberry and menziesia to low, depauperate layers of grouse whortleberry or heartleaf arnica. Thus, the quality of lynx foraging habitat (i.e., snowshoe hare habitat) often varies greatly by habitat type. Engelmann spruce stands commonly occur along streams and valley bottoms where cool air drainage allows them to extend into the adjacent, lower elevation Douglas-fir communities. Habitat types within the series often occur on very wet sites and on steep northerly aspects where snow accumulates. Though a minor series, Engelmann spruce habitat types commonly provide good lynx travel corridors and denning habitat.

Douglas-fir habitat types occur over the broadest range of environmental conditions of any conifer in central Idaho. Douglas-fir communities often extend from lower to upper timberline, especially in the drier mountain ranges. The types of most importance to lynx include those where lodgepole pine is a seral species and those, which abut shrub-steppe communities. Within central Idaho, many habitat types within the Douglas-fir series are too dry and/or depauperate to provide good lynx foraging habitat.

Atypical lynx habitats in central and southern Idaho, Wyoming, southeast Montana, and eastern Oregon occur in the shrub-steppe communities where populations of alternate prey such as whitetail jackrabbits are found. These atypical habitats often provide connectivity between adjacent mountains ranges. Along the Continental Divide, they may also provide an important north/south link between large areas of typical habitats.

Existing Condition

In Oregon, there are 12 verified records of lynx documented between 1897-1993 (Ruggiero et al 1999, Verts and Carraway 1998). Locations for these specimens include:

- One from the Willamette Valley (taken in atypical habitat-suburban residential area, near Corvallis, Oregon)
- Two from the Cascade Range
- One from Steens Mountain
- One from the Stinkingwater Mountains
- Five from the northern and central Blue Mountains
- One from the Wallowa Mountains (taken in atypical habitat-bunchgrass-rimrock habitat, near Imnaha, Oregon)
- One in 1993 from the southern Blue Mountains in anomalous (non-typical) habitat (near Drewsey, Oregon - occurrence was positively identified from physical remains (portion of skull and pelt)

Of these 12 known specimens, one each was collected in 1897, 1964, 1974, and 1993; 2 in 1920; and 3 each in 1916 and 1927.

Peaks in density of lynx populations in Alaska reportedly occurred in 1916-1918, 1926-1928, 1963-1966, and 1974-1975 (Quinn and Parks 1987). Collection dates in populations farther north; even the collection of lynx in Oregon in 1920 may be related to an exceptionally high peak in 1914-1916 (Quinn and Parks 1987). The 1993 specimen was also collected within several years of a lynx population peak in western Canada (Ruggiero et al. 1999). Verts and Carraway (1998) concludes from this that lynx occurrence in Oregon likely are of dispersers from within currently occupied areas farther north that immigrate into the area and persist for a short time Thus, self-maintaining populations of lynx likely have not existed in historical times in Oregon.

The Fish and Wildlife Service (2000) states, "…many of the lynx records in the contiguous United States, including Oregon, are of transient animals that disperse during cyclic population increases". Animals that are considered "dispersing" and found in unsuitable habitat are considered lost from the metapopulations; therefore, they are unlikely to survive unless they return to the boreal forest (USF&WS 2000).

In addition to verified records, there are 72 spatially referenced occurrences in Oregon (Ruggiero et al. 1999). This includes 20 records of physical evidence (15-reliable, 5-unknown reliability), 1 report of tracks (unknown reliability), 36 visual reports (9-reliable, 27-unknown reliability), and 15 unknowns.

In Harney and Grant Counties, there are nine "spatially referenced" unconfirmed occurrences (Table 7.). Reliability varies for unreliable to very good but are not considered confirmed/verified.

The Emigrant Creek Ranger District defines an "**unconfirmed**" sighting as:

- An uncollaborated sighting of an animal by an observer lacking the necessary skills to properly identify and differentiate the animal in question from similar species (i.e., bobcat).
- A sighting of an animal by a trained observer that lacks any physical evidence.

For sightings to be considered as "confirmed":

- Observation must be independently collaborated by additional trained observers or
- An observer must be clearly familiar with the species in question, and physical evidence such as photos of the animal or its tracks, physical remains, track castings, hair samples should be collected to positively confirm the sighting.

Because of the uncertainty of unconfirmed sightings, it would be dubious to infer that lynx are present in a given area.

Table 7. "Unconfirmed" Occurrences of Lynx in Harney and Grant County

County	Location	Date
Grant	Umatilla National Forest	1980
Grant	Wallowa-Whitman NF	1990
Grant	Malheur National Forest	1991
Grant	Malheur National Forest	1996
*****Harney	Ochoco National Forest	1997
Grant	Umatilla National Forest	1997
Grant	Malheur National Forest	2000
Grant	Malheur National Forest	2000

*****1997-occurrence on the Snow Mountain Ranger District. Occurrence was a visual observation considered to have very good reliability. Observation lacked independent collaboration by additional trained observers or physical evidence to verify occurrence.

Current Pacific Northwest Distribution Assessment

In Washington, lynx occurred historically along the Cascade Range down to Mount Adams (Dalquest 1948) and lynx occurred historically as far south as the southern end of the Cascade Range (Ruggiero et al. 1999, Weaver and Amato 1999).

A national interagency survey was initiated in 1999. Surveys conducted in 2001 were the third, and in many cases, the final year of surveys in a three-year effort. The surveys were conducted in the Pacific Northwest, the Rocky Mountains, Great Lakes and Northeastern parts of the country to assess lynx distribution. Surveys conducted in the Pacific Northwest also met Northwest Forest Plan (NWFP) survey requirements.

The Forest Service is using the National Lynx Detection Protocol developed as part of the Interagency Lynx Conservation Assessment Strategy and Agreement. Forests surveyed in the Pacific Northwest include the Mt. Baker-Snoqualmie, Okanogan, Wenatchee and Gifford Pinchot National Forests (NF) in Washington, and the Mt. Hood, Willamette, Deschutes, Umpqua, Winema, Rogue River, Wallowa-Whitman, Ochoco, Malheur, and Umatilla NFs in Oregon.

The survey method capitalizes on a common felid (cat) behavior of scent-marking territories by rubbing. Rubbing stations were placed in potential lynx habitat and scented with a lure to induce lynx to rub and leave hair at the sampling station. Since several wildlife species may be attracted to the stations and leave hair, a DNA analysis method to distinguish species, using only hair, was developed.

In Oregon and Washington, the FS set up approximately 450 transects, each with five rubbing stations. Surveyors visited each rubbing station twice, resulting in a total of about 4,520 sample sites. All hair samples were cataloged and referenced to allow biologists to identify exactly where the hair samples were collected. There were several lynx hair samples sent to the DNA laboratory that were not collected as part of the field surveys, but these were identified and isolated from the rest of the field collected hair samples. They are not included in the results table that follows.

DNA analysis of collected hair determined that lynx are present in Washington (Okanogan National Forest) but was unable to document presence in Oregon and other forests in Washington.

Based on the limited available information, the Fish and Wildlife Service cannot substantiate the historical or current presence of a resident lynx population in Oregon (USF&WS 2000). Based on records and available collections, Verts and Carraway (1998) conclude that there is no evidence of self-maintaining populations in Oregon and USDI (1997) considered lynx "extirpated" from Oregon. Additional surveys and research are warranted before lynx are considered as having self-maintaining populations in Oregon.

Local Surveys

Camera set results: Multiple baited camera stations were set up in the watershed in 1992-1994 (Gold Hill, Flat Creek, Gilbert Ridge, Myrtle Creek, Lost Creek, and Silvies River) and 1996 (Myrtle Park) to survey for marten, lynx, and wolverine presence. Methodology closely followed that suggested by Zielinski and Kucera (1995).

No lynx were documented by camera sets.

Snowmobile snow tracking survey results: Snow track intercept surveys (Myrtle Park Route) were conducted in the watershed during the winters of 1992-93, 1993-94, and 1994-95.

No lynx tracks were found during these track surveys.

Hair-Snag Pad Surveys 1999 to 2001, the Forest Service and Fish and Wildlife Service (1999 only) conducted hair capture surveys in the Snow Mountain, Blue Mountain and Prairie City Ranger Districts. Survey protocol followed that developed as a part of the Interagency Lynx Conservation Assessment Strategy and Agreement and by Dr. John Weaver. This was part of a region-wide survey to be conducted in Oregon and Washington.

No lynx hair was captured during these surveys. DNA analysis of hair captured from survey sites confirmed bobcat presence.

There were no surveys conducted on the Emigrant Creek Ranger District during this time as no primary habitat is present in sufficient quantity on the district.

Habitat Model

Lynx habitat was modeled for the Emigrant Creek Ranger District and Snow Mountain District using plant associations considered as primary and secondary vegetation (Appendix D).

The Western boreal forests within the range of the lynx are dominated by three tree species: lodgepole pine, Engelmann spruce, and subalpine fir (Ruggiero et al 1999). Subalpine fir, Engelmann spruce, cedar, and lodgepole pine are considered primary lynx habitat. There are no subalpine fir, cedar or Engelmann spruce plant associations in the project area or on these two districts. The closest stands occur in the Strawberry Mountains. There are small, scattered lodgepole primary vegetation blocks present on the districts, mostly in the northern portions. There are also small, scattered, non-continuous secondary vegetation blocks in portions of the District. This includes, some grand fir, aspen and alder plant associations.

Additional reviews of grand fir plant associations indicate that most these dry grand fir (ABGR/VASC) sites do not qualify as secondary lynx habitat.

Within the Silvies watershed/project area there are about 294 acres of primary vegetation (lodgepole pine (ABGR)/grouse huckleberry/pinegrass (CLG211)). There are an additional 1,011 acres of fragmented secondary vegetation (99 acres of Douglas-fir/ocean spray (CDS611), and 912 acres of Grand fir/birchleaf spirea (CWG113), aspen not included) present.

Conclusion on Status and Distribution in Oregon

Based on the limited available information, the Fish and Wildlife Service cannot substantiate the historical or current presence of a resident lynx population in Oregon (USF&WS 2000). The Fish and Wildlife Service (USF&WS 2000) goes on to states that "…many of the lynx records in the contiguous United States, including Oregon, are of transient animals that disperse during cyclic population increases".

Based on records and available collections, Verts and Carraway (1998) conclude that there is no evidence of self-maintaining populations in Oregon and USDI (1997) considered lynx "extirpated" from Oregon.

Effects and Determination

Common to All Alternatives

From a review of currently available research, lynx habitat was always found in association with spruce and subalpine fir habitats (Ruggiero et al. 2000). This watershed lacks any association with spruce or subalpine fir, is too dry and the site potential too limited to provide anything more than poor lynx foraging habitat or marginal connectivity/dispersal habitat. The closest significant area of possible lynx habitat is located over 22 miles to the north.

Research indicates that lynx need at least 15 square miles (9,600) of low-hare-density habitat to support a functional home range (Ruediger et al. 2000, pg. 1-5). Reudiger et al. (2000, pgs. 7-3 through 7-4) go on to recommend that Lynx Analysis Units (LAUs) should be 16,000-25,000 acres in contiguous habitat; at least 10 mi^2 (6,400 ac.) of primary vegetation should be present in the LAU to support survival and reproduction. With less than 1,400 acres of habitat available in the entire 65,000-acre watershed (294 acres of primary habitat and 1,011 of secondary habitat), the Silvies watershed/project area does not provide enough habitat to sustain a lynx home range. Throughout all versions of lynx habitat analysis, the Silvies Canyon project area was never in an LAU and was never considered to be lynx habitat because of the lack of adequate habitat. In addition, this project area is not within or adjacent to a Malheur LAU or any other LAUs because the Ochoco National Forest does not have LAUs.

Many of the lynx records in the contiguous United States, including Oregon, are of transient animals that dispersed during cyclic population increases. Animals that are considered "dispersing" and found in unsuitable habitat are considered lost from the metapopulations; therefore, they are unlikely to survive unless they return to the boreal forest (USF&WS 2000). Should dispersing lynx move through the area, they could use the connectivity corridors left to connect late and old stands, as required by the Forest Plan.

Although there is one confirmed sighting and other unconfirmed sightings in Grant and Harney Counties, there is no indication that lynx regularly occur in or use the project area. The likelihood of lynx using or frequenting the area is expected to be very low due to the lack of lynx habitat.

Cumulative Effects
There would be no cumulative effects to lynx from any of the alternatives.

Determination

Since there is not sufficient habitat in this watershed to consider this area as contributing to lynx habitat and since no lynx are expected to inhabit the project area, all alternatives would have **No Effect (NE)** on lynx.

V. Potential Effects of the Proposed Action on Sensitive Species

The two criteria for evaluating potential effects to sensitive species are:

Would implementation of any of the alternatives contribute to the loss of viability for species listed as sensitive (**S**) by USDA-Forest Service Region 6, or any native or desired non-native species, or

Would implementation of any of the alternatives cause any species to move toward federal listing (FSM 2672.4) under the Endangered Species Act?

Sensitive Animals

California wolverine
(Gulo gulo luteus) Elliot 1904

Status

Federal Status: Species of Concern (list 1-7-00-SP-588). On April 19, 1995, the USDI Fish and Wildlife Service published a 90-day finding for a petition to add the contiguous United States population of the

North American wolverine (*Gulo gulo luscus*) to the List of Threatened and Endangered Species. The Service found the petition did not present substantial information indicating that listing the wolverine in the contiguous United States may be warranted.
USDA-Forest Service (Region 6) Status: Sensitive
State Status: Threatened (ODFW 2000)
Oregon Natural Heritage Program Status: List 2 (ORNHP 2000)

Conservation Status Ranking

(The Association for Biodiversity Information 2000)

Global Rank=G4T3 (Nov 18, 1996)
National=N3 (Jan 15, 1997)
Oregon State Rank=S2

Major Threats

Status is not well known in many portions of the range and wolverine are extirpated from most of its historical range in the contiguous 48 states. Wolverines are showing promising signs of semi-recovery in selected western states (TNC 1999).

Wolverine populations are suspected to be small, especially sensitive to disturbance, and vulnerable to local extinction (USDA 1994). Past decline in population may have been due primarily from fur trapping, but habitat alteration (e.g. agriculture, oil exploration, cattle grazing, rural settlement, timber harvest, road construction, and ski area development) and general human disturbance are contributing factors (TNC 1999, Witmer et al. 1998).

Population Status and Trend

Hash (1987) describes a contraction in the North American range of the wolverine beginning around 1840 with the onset of extensive exploration, fur trade, and settlement. State records suggest very low wolverine numbers in Montana, Idaho, Oregon, and Washington from the 1920s through 1950s, with increases in wolverine sightings since the 1960s (Banci 1994).

Source Habitat Trend

Basin-wide, source habitat was projected to have increased moderately or strongly in 56 percent of the watersheds. The Blue Mountains ERU has undergone a positive absolute (+27.46%) and relative (>100.00%) change in source habitat availability (moderate or strong increases in more than 50 percent of the watersheds). An increase in Blue Mountains source habitat was most influenced by an increase in mid- and late-seral montane community types (Wisdom et al. 2000).

Habitat

The wolverine occurs in a broad range of wilderness habitats (Verts and Carraway 1998). Source habitats for wolverines include alpine tundra and all subalpine and montane forests. Within the forest type, all structural stages except the closed stem exclusion stage provide source habitat (Wisdom et al. 2000). The impression that wolverines require high elevation habitat may be a result of remaining wolverine populations retreating to inaccessible, undeveloped areas, which are often at high elevations (Witmer et al. 1998).

They are solitary predators that range over vast and remote territories; consequently, they are difficult to study and to survey (Rausch and Pearson 1972). Most available research indicated that wolverines were strictly associated with secluded wilderness areas and that distribution is probably limited to upper montane and sub-alpine forest types. Some recent work suggests that although wolverines may frequent upper montane and sub-alpine habitat during most of the year, they may follow migrating big game herds to lower elevation winter range and scavenge on winterkills, which is considered a primary winter food source (Wisdom et al. 2000, Ruggiero 1994).

In summer, wolverines use a variety of foods including small mammals, birds, carrion, and berries (Wisdom et al. 2000). Copeland (1996) found that carrion-related food supplied 46 percent of wolverine diets in Idaho during both summer and winter. Banci (1994) suggests that diversity of habitats and foods is important to wolverines.

Several special habitat features have been identified for wolverines. Natal dens in the western United States are generally located in subalpine basins in isolated talus fields surrounded by trees (Copeland 1996). There is also evidence that wolverine use down logs and hollow trees for denning and cavities in live trees may be used (Wisdom et al. 2000). Both talus and areas associated with large, fallen trees were used as maternal dens sites in Idaho (Copeland 1996).

Regardless of habitat type used, the critical component to suitable source habitat seems to be the absence of human activity or development (Hash 1987). High elevation wilderness and undisturbed

backcountry refugia are still considered critical to the current welfare and viability of existing wolverine populations (Hornocker and Hash 1981).

Denning Habitat

A denning habitat model developed primarily by Jeff Copeland, Idaho Department of Fish and Game, was used to identify potential wolverine denning habitat on the Malheur National Forest. Utilizing satellite imagery and GIS data, key habitat components were queried to produce a forest level coverage of potential denning habitat. Key elements included topographic relief with flat to concave curvature, slopes with north to northeast aspects, areas above 5,000-foot elevation, and rock or snow covertypes.

Results: Large areas of potential denning habitat were identified in the Strawberry Wilderness, Monument Rock Wilderness, and in some northern portions of the Malheur National Forest. Isolated potential denning habitat points were identified on the Emigrant Creek Ranger District. Most of these data points identified by the model are a result of "data noise" or are not likely suitable denning habitat because of size or position on the landscape in relationship to developments, roads or natural landscape conditions.

Distribution

Wolverines once occupied the boreal zone across the northern part of the continent and southward into the mountains of Colorado and California. Bailey (1936) states that wolverine were thought to be rare in the United States, but probably were not yet extinct in the Cascades and Sierra Nevada's.

Since Bailey's report, numerous animals have been collected or sighted around the northwest. A query of the Oregon Natural Heritage database reveals that there are about 150 observations of wolverines in Oregon, with most occurring in the mountainous northeast (Baker, Grant, Umatilla, Union and Wallowa Counties) region (Edelmann and Copeland 1997).

Confirmed observations on Malheur National Forest and adjacent areas include:

- Collection of an animal from Steens Mountain, Harney County, (1973)
- Hair and track collection on Snow Mountain Ranger District, Ochoco National Forest (1992)
- A partial skeleton and tufts of fir found near Canyon Mountain, Grant County (1992)
- Tracks and a probable denning site found in the Strawberry Mountains (1997)
- Tracks in Monument Rock Wilderness (1997)

There are 7 "unconfirmed" sightings of wolverines on the Emigrant Creek Ranger District; Hall Creek (1983), Gilbert Ridge (1990), Crooked Creek (1991), Paine Creek (1991), Gold Hill (1993), Silvies River (1994), and along Burnt Cabin Creek (1987).

Because of the uncertainty of unconfirmed sightings, it would be dubious to infer that wolverine movement corridor or even a territory is present in the area.

Local Surveys

Camera set results: Multiple baited camera stations were set up in the watershed in 1992-1994 (Gold Hill, Flat Creek, Gilbert Ridge, Myrtle Creek, Lost Creek, and Silvies River) and 1996 (Myrtle Park) to survey for marten, lynx, and wolverine presence. Methodology closely followed that suggested by Zielinski and Kucera (1995).

No wolverines were documented by camera sets.

Snowmobile snow tracking survey results: Snow track intercept surveys (Myrtle Park Route) were conducted in the watershed during the winters of 1992-93, 1993-94, and 1994-95.

No wolverine tracks were found during these track surveys.

Aerial snow tracking survey results: On 02/24/1997 Oregon Department of Fish and Wildlife personnel conducted an aerial survey of potential wolverine habitat on the Malheur National Forest.

Observers located probable wolverine tracks leading to and from a potential wolverine natal or maternal den in the northwest corner (T.14S., R.32E.) of the Strawberry Wilderness. Additional aerial reconnaissance of the area on 02/25 located additional tracks leading to and from the potential denning site.

A second set of tracks was observed in the Monument Rock Wilderness (T.14S., R.36E.) near the crest of Table Rock. No obvious denning or feeding locations were found associated with these tracks.

A third set of probable wolverine tracks were found in the Pine Creek drainage near the Lost Fork of Pine Creek. No obvious denning or feeding locations were found associated with these tracks.

Tracks observed showed the correct gate patterns for wolverine and were the correct size but physical evidence (track casts or detailed photos) could not be collected. Reliability of observation is high.

Existing Condition

Wolverines were always rare in Oregon, although recent sightings, tracks, and collected remains document their continued presence at low densities in the state (Csuti et al. 1997). Current distribution appears to be restricted to isolated wilderness areas. Verts and Carraway (1998) believe that while there is a possibility of self-maintaining population of wolverine in the state, most animals seen or collected are likely dispersers from Washington and Idaho populations. The most recent "unconfirmed" sighting of a wolverine was reported in 1994, in the Silvies River Canyon, which is within the planning area.

Source habitat is very limited in this watershed. There are no subalpine forest types with or without talus surrounded by trees in or adjacent to this area. The nearest area that approximates this habitat type is located in the Strawberry and Aldrich Mountains, over 35 miles to the north.

Because wolverines are sensitive to disturbance, the high levels of human disturbance (recreational use, firewood cutting, and management activities) reduce the suitability of the area for wolverine. The area provides an adequate prey base, which is often carrion frequently associate with big-game range. Four of the seven subwatersheds in the project area are below Forest Plan cover standards on summer range and two of seven are below standards on winter range. The habitat effectiveness index (HEI) is slightly above standards in summer range in all except one subwatershed, and it is slightly below standards in winter range in all but two subwatersheds. Despite being below standards, elk are at management objectives established by Oregon Department of Fish and Wildlife within the Silvies Wildlife Management Unit.

The likelihood of wolverine using or frequenting the area is expected to be very low.

Effects and Determination

Alternative 1 (No Action Alternative)

Direct and Indirect Effect:

Under the No Action Alternative, there would be no management activities; therefore, there should be no direct or indirect effects to wolverine or potential habitat.

Alternative 1 maintains existing big-game habitat and open road densities. Existing big-game populations provide an adequate prey base for wolverine should they occupy or disperse through the area in the future. Predator/human interactions usually increase with increased road density. Road densities in the Silvies Canyon Watershed range from over 5 miles per square mile in the Myrtle Creek subwatershed to just under 3 miles per square mile in the Boulder/Fawn subwatershed. Because unroaded areas provide the best habitat for wolverine, densities in this watershed result in degraded habitat. Road densities and big-game habitat would not change with this alternative.

Cumulative Effects

Ongoing activities, such as livestock grazing, would continue in the project area. Grazing would not contribute to cumulative effects on wolverine. Alternative 1 would maintain adequate wolverine prey species in the short-term; however, elk habitat quality could be reduced in the foreseeable future when stand-replacing events (such as a fire or insect outbreak) remove available cover. The likelihood of such events is higher in Alternative 1 than in the action alternatives.

Determination

Due to the nature of the no action alternative, and that wolverine are not known to inhabit the area, Alternative 1 would have **No Impact (NI)** on wolverine or wolverine habitat. There are potential indirect, long-term effects from large-scale insect and disease outbreaks infestation and catastrophic wildfire that could occur because of not addressing current forest heath issues. The magnitude and timing of these potential impacts are unknown, but they could drastically modify potential wolverine prey and dispersal habitat conditions for many years to come.

Alternative 2, 4, 5, 7, and 7a

Direct Effect

There are no confirmed records of this species occurring in the project area; therefore, there would be no direct effect to individuals.
Indirect Effects

Minor indirect effects to travel/dispersing habitat are anticipated.

Alternatives 2, 4, 7, and 7a reduce big-game cover on summer range in all subwatersheds and reduces cover on winter range in all subwatersheds except Red Hill and Stancliffe Creek. Alternative 5 reduces big-game cover on summer range in all except the Boulder/Fawn and Red Hill subwatersheds and reduces cover on winter range in all subwatersheds except Stancliffe Creek. Although cover is being reduced, habitat effectiveness improves in these alternatives on both summer and winter range due to road closures. Big-game animals might move from an area during treatments, but they are expected to return upon completion. Although cover is being reduced, the effect on big-game populations is not expected to be measurable; there fore adequate prey should remain in the watershed to provide forage for wolverine. Elk and deer numbers are expected to stay stable, thereby maintaining the potential forage base for wolverine.

There are no effects anticipated for wolverine or their habitat with implementation of weed control documented sites or new sites within the watershed.

Wisdom et al. (2000) suggests several management practices that could be used to reverse broad-scale declines or accelerate improvements in source habitat within the Interior Columbia Basin. While developed primarily for the northern portion of the basin they can be used in the southern portion with beneficial results. They include:

Maintain current wilderness areas and other reserves as refugia for wolverines.
Minimize new construction of secondary roads and close unneeded roads after timber harvest.
Retain existing old forests and identify mid successional forests where attainment of old-forest conditions can be accelerated.
Actively recruit snags and logs in mid-seral and old forests where these old-forest structures are uncommon or absent.

Refugia

The Myrtle-Silvies Semiprimitive Area covers much of the center of the project area and provides a sizable refugia area. This area does not contain sufficient habitat to support long-term occupation by wolverine but could be used by transient animals.

Under these alternatives, this area would not be entered or modified in a manner that could affect wolverine.

Road Densities

Under these alternatives, road densities would be substantially reduced in all subwatersheds. This reduction in road densities should result in a reduction in potential wolverine human conflicts and increased areas with no or minor road effects if a transient animal passed through the watershed. Security areas (areas ½ mile or more from an open road) would increase in all action alternatives. In Alternative 1, about 5% of the project area (3,150 acres) is security area; the amount of security rises to 6% in Alt. 5, 7% in Alts. 2, 6, 7, and 7a, and 10% in Alt. 4.

Harvest

Ruggiero et al. (1994) indicates that the impacts of logging and associated activities on wolverine and wolverine habitat can only be surmised. Some research indicate that while wolverine in some ecoprovinces prefer to occupy mature to intermediate forest habitat, other studies find that there is no difference in movements, habitat use or behavior between wolverine occupying logged and unlogged areas (Hornocker and Hash 1981).

Under these alternatives, there are no proposals to drastically modify existing stand structure or reduce connective habitat to a point of excluding possible wolverine use. However, human disturbance related to proposed activities (sale layout, road reconstruction, harvest, post-harvest treatments) might displace transient dispersing wolverine from potential foraging habitat during the duration of the project.

Under these alternatives, about one third of existing old forest multiple strata and old forest single strata habitat would be entered with the goal of restoring environmental processes associated with healthy, structurally complex that matches site potential and is sustainable over time. Structural elements would be retained to achieve the management objective of

providing structural habitat elements in harvested stands while removing wood products.

Hayes et al. (1997) indicate that thinning can likely enhance habitat, particularly if critical structural components, such as dead wood, are provided and if stands are managed to provide vertical and horizontal heterogeneity. Kohm and Franklin (1997) concludes that many species and processes can tolerate conditions in a harvested area if key structural elements are still present and there is at least some level of climatic protection.

In later stages of stand development, thinning may lead to stands that resembled historical stand conditions that were once found across much of the watershed. Treated stands would have a well developed understory beneath a open overstory made up of a few large trees per acre. After treatment the resulting stand structure should more resemble a multistoried, uneven-aged stand (Hayes et al 1997).

Under these alternatives, a substantial amount of thinning would occur in mid-seral stands, especially in stem exclusion stage stands. Thinning young mid-successional stands may provide growing conditions that more closely approximate those historically found in developing old-growth stands, thereby accelerating development of structure found in late seral forests (Hayes et al. 1997). Although thinning can reduce the total volume of wood in a stand, it promotes rapid growth of individual trees by reducing competition for light and water (Arno and Stephen 1999, Tappeiner and Latham 1999, Hayes et al. 1997, Edminster and Olsen 1996, Hatz 1991).

Snag and Down Wood Recruitment

Snags or down wood would not be actively treated as part of the vegetation management or fuels reduction prescriptions, though some could be felled as hazard trees or burned during prescribed burning. Regional direction for retention of down wood would be applied to retain this habitat for wildlife, including wolverines, which are associated with this habitat. If standards were not met upon completion of fuels treatments, additional snags would be created in old growth stands (replacement) to provide snags at a historical level.

Other proposed activities (such as old-growth reconfiguration, spring restoration, juniper reduction, weed treatment, and aspen restoration) may provide enhanced habitat diversity, but would have no measurable effect on wolverine or their habitat.

Cumulative Effects on Potential Habitat:

All alternatives would be expected to maintain adequate wolverine prey species, despite the potential for cumulative effects to elk.
Permitted livestock grazing would continue during and after timber harvest, precommercial thinning, and prescribed fire in the area. Despite the potential effects of grazing, grazing is not expected to contribute to cumulative effects on wolverine.

Proposed road decommissioning activities associated with this project would have synergistic beneficial effects with past road closures. The combined road closures and decommissioning would result in a reduction of road densities throughout the watershed.

It is likely that proposed and future treatments would restore environmental processes associated with healthy, structurally complex ponderosa pine and mixed confer forests which could slightly improve potential dispersal habitat in the area.

Determination

Wolverine dispersal habitat and prey species would be maintained. The potential benefit of reduced road densities or negative impact of disturbance is extremely small and would not be measurable. Because wolverine are not known to inhabit the area, because the project area is not remote, provides no denning habitat, and provides only travel/dispersal habitat, and because activities will not affect dispersal habitat, these alternatives would have **No Impact (NI)** on wolverine or wolverine habitat.

Alternative 3 and 6

Direct Effect

There are no confirmed records of this species occurring in the project area; therefore, there would be no direct effect to this species.

Indirect Effects on Potential Foraging Habitat

Under these alternatives, treatment focuses on the reduction of ladder fuels with precommercial thinning and prescribed fire.

While the treatments proposed under this alternative do not aggressively treat high priority stands in the project area, they do begin to move stand structure

in the area toward HRV, and contributes to restoring ecological balance to forest habitat in the project area. Stands that were experiencing reduced vigor and stand health because of overstocking, fire exclusion, and insect and disease-related mortality would continue to be influenced by these forces, but the level of influence would be reduced.

Using precommercial thinning, as a pretreatment for prescribed burning would reduce the potential for fires burning out of prescription and causing significant modification of old forest structure, although, the remaining high stand densities would likely contribute to higher understory and overstory tree mortality even if prescribed burning was successfully implemented.

These alternatives maintain or improve big game habitat effectiveness (over existing conditions) in all subwatersheds. While habitat quality may improve, elk numbers would not change drastically since area elk are at management objectives and the Oregon Dept. of Fish and Wildlife is currently managing elk to maintain elk numbers at the management objective.

Under these alternatives, a substantial amount of road closures would also occur. The results would be similar to that discussed above.

Other proposed activities (such as old-growth reconfiguration, spring restoration, juniper reduction, weed treatment, and aspen restoration) may provide enhanced habitat diversity, but would have no measurable effect on wolverine or their habitat.

Cumulative Effects

The cumulative effects of these alternatives would be the same as those described for the other action alternatives.

Determination

Wolverine dispersal habitat and prey species would be maintained. The potential benefit of reduced road densities or negative impact of disturbance is extremely small and would not be measurable. Because wolverine are not known to inhabit the area, because the project area is not remote, provides no denning habitat, and provides only travel/dispersal habitat, and because activities will not affect dispersal habitat, these alternatives would have **No Impact (NI)** on wolverine or wolverine habitat.

pygmy rabbit

(Brachylagus idahoensis) Merriam 1891

Status

Federal Status: Species of Concern (list 1-7-00-SP-588).
USDA-Forest Service (Region 6) Status: Sensitive (USDA 2000)
State Status: Vulnerable (ORNHP 2000)
Oregon Natural Heritage Program Status: List 2 (ORNHP 2000)

Conservation Status Ranking

(The Association for Biodiversity Information 2000)

Global Rank=G4 (November 2, 1998)
National=N4 (December 05, 1996)
Oregon State Rank=S2

The U. S. Fish and Wildlife Service added the Columbia Basin population of the pygmy rabbit to the Federal list of endangered species March 5, 2003, after determining that the population meets the Service's criteria to be listed as a distinct population segment (DPS) under the Endangered Species Act. Historically, the Columbia Basin pygmy rabbit was found in appropriate shrub-steppe habitats in portions of Douglas, Grant, Lincoln, Adams, and Benton Counties, Washington. Oregon populations were not included in this listing.

Major Threats

Threats include range wildfire, sagebrush eradication to improve range conditions for livestock grazing, invasion of exotic annuals, conversion of shrub-steppe to cropland, and fragmentation of remaining suitable and occupied habitat (WDFW 1995).

Population Status and Trend

Moderately threatened range-wide, habitat or community lends itself to alternate use.

Washington Department of Wildlife reports that pygmy rabbit had declined greatly in eastern Washington. Washington Department of Fish and Wildlife (1995) estimated that the state’s population is less than 250 rabbits in five areas.

Little information is available on population trend in

other states.

Source Habitat Trend

The trend for Great Basin shrubsteppe habitats is generally downward due to fire, grazing, invasion of exotic annuals, and agricultural conversion, which likely correlate with downward trends for sagebrush obligate species such as the pygmy rabbit (Whisenant 1990; Knick and Rotenberry 1995, 1997).

Degree of Fragility

Fairly resistant and tolerant of nondestructive intrusion.

Habitat

Pygmy rabbits are closely tied to habitats dominated by big sagebrush (*Artemisia tridentata*) growing on deep, loose, friable soil types (Verts and Carraway 1998, WDFW 1995). Sagebrush is a key habitat element for this species because is provides both forage and cover. When 10 habitat variables were submitted to discriminant analysis, shrub cover was the most important variable distinguishing site occupancy by pygmy rabbits from adjacent sites. Soil depth was the second most important variable of importance (WDWF 1995).

The principal food of this species is big sagebrush, even where other tall shrubs such as bitterbrush (*Purshia tridentate*) are common. On an annual basis, sagebrush composes 67% of the diet, grasses 26% and forbs only 6% (Verts and Carraway 1998).

Sagebrush present on occupied sites characteristically forms tall and very dense stands. Occupied sites have an average shrub height of 33 $\pm$ 2 inches and an average overall shrub cover of 28.8 $\pm$ 1.4%, with sagebrush making up almost 24% of the total (Verts and Carraway 1998).

In southwestern Wyoming, pygmy rabbits selectively used dense and structurally diverse stands of sagebrush that accumulated a relatively large amount of snow; the subnivean environment provided access to a relatively constant supply of food and provided protection from predators and thermal extremes (Katzner and Parker 1997).

Soil type is also a major factor in habitat suitability. Soils need to be of the proper depth and texture to excavate for burrows. Burrows are most commonly found in loose coarse-silty and fine-loamy soil types derived from loess or glacial parent material. Burrows usually extend to no more than 3 feet in depth (WDFW 1995).

Occupancy of potential habitats is likely related to a combination of availability of forage, security from predators, and ease of burrow construction.

Distribution

This species can be found in the southeastern third of Oregon to east-central California, east to western Utah and southwestern Montana. Isolated populations occur in east-central Washington (WDFW 1995). Within its range the distribution is not continuous but patchy, primarily in areas of Great Basin big sagebrush dominated plains and alluvial fans where plants occur in tall and dense clumps, and the soil relatively deep and friable (NatureServe 2000)

In Oregon, pygmy rabbits have been documented at 37 sites east and south of a line connecting Klamath Falls, Klamath County; Fremont, Lake County; Redmond, Deschutes County; and Baker City, Baker County (Verts and Carraway 1998). Sightings within Harney County indicate that this species occurs mainly in the sagebrush basin south of Burns Oregon. An isolated locality record documents a historical occurrence in Silvies Valley (near Seneca, Oregon).

Existing Condition

Confirmation of the presence of pygmy rabbits has not been done but an analysis of potential habitat was conducted using current data. GIS analysis indicates that there is about 10,691 acres of shrublands in Silvies Canyon Project area. The bulk of the acres were classified as generic dry shrublands (8,770 acres). Mountain Mahogany (936 acres) and wet grasslands/shrub-meadows (664 acres) makes up the remaining large classes of the acreage classified.

Several additional shrubland associations are present but are minimally represented. This includes 4 small shrubland stands of mountain big sagebrush plant association (ARTRV/FEID-AGSP) habitat totaling 120 acres (mean=30, range 8 to 53 acres) widely scattered across the southern end of the watershed.

This association represents habitat most likely to be suitable for pygmy rabbit use in the Silvies Canyon

Watershed. This association is described as rough to rolling, or undulating terrain with mountain big sagebrush and bunchgrasses growing in deep, stony soils (Johnson and Clausnitzer 1992).

Effects and Determination

Alternative 1 (No Action Alternative)

Direct and Indirect Effect

Based on the scattered distribution of mountain big sagebrush habitat, its small size and lack of suitable linkage corridors, the likelihood of pygmy rabbit occupying these habitat blocks is very low.

Under the No Action Alternative, there would be no new management activities; therefore, there should be no direct or indirect effects to limited potential pygmy rabbit habitat present in the watershed.

Pygmy rabbits have evolved in the presence of native ungulate grazing. Historical heavy livestock grazing has apparently lowered the resilience of sagebrush plant communities across much of this species range.

The influence of ongoing cattle grazing on pygmy rabbit habitat is not well understood. In general, grazing is known to affect the characteristics of sagebrush communities. The effects depend on a variety of factors including timing and intensity of grazing, stocking densities, location of water sources and salting areas, and other factors that would concentrate cattle use in suitable habitat (WDFW 1995).

It is speculated that livestock grazing may result in forage competition during the spring and summer when pygmy rabbits preferentially select grasses, and heavy grazing can cause breakage of sagebrush plants because of trampling. On the other hand, grazing can increase sagebrush densities and vigor when grazing animals selectively graze on perennial forbs and grasses and reduce competition for limited resources.

Determination

Because of low habitat potential and the low likelihood of pygmy rabbit occurrence in these areas there would be **No Impact (NI)** from implementation of any alternative.

Direct and Indirect Effects Common to All Action Alternatives

Based on the scattered distribution of mountain big sagebrush habitat, its small size and lack of suitable linkage corridors, the likelihood of pygmy rabbit occupying these habitat blocks is very low.

Most management activities (such as road closures, old-growth reconfiguration, and spring and aspen restoration) would not impact sagebrush habitats since treatment would not occur within them. However, sagebrush habitats would be affected by fire and by juniper reduction.

Sagebrush habitats, particularly those in the southern part of the project area-see mitigation measures), would not be actively treated (ignited) with prescribed fire though a small amount of light intensity burning may occur on the fringes of these habitats. 15% or less of these shrublands within burn blocks are expected to burn (G. Mackey, pers. com.); this would further reduce habitat potential until vegetation recovered (15 years).

Juniper reduction may provide for limited expansion of sagebrush in areas formerly dominated by encroaching juniper, but these areas would be limited, scattered, and may not provide the deep soils used by pygmy rabbits. Juniper reduction would have no measurable effect on pygmy rabbits or their habitat.

Cumulative Effects

Ongoing grazing in the watershed is not likely adversely impacting limited potential habitat that exists in the watershed, though the potential for effects from grazing (as described in Alternative 1) would continue.

Determination

Because these sites are already considered “very low in potential”, any activities that alter vegetation structure or availability would not likely further reduce its very limited potential. Because of this low habitat potential and the low likelihood of pygmy rabbit occurrence in these areas there would be **No Impact (NI)** from implementation of any action alternatives.

Sensitive Amphibians

Columbia Spotted Frog
Population 3-Great Basin
(*Rana luteiventris*) Thompson, 1913

Status

Federal Status: N/A The Great Basin population (Idaho, Nevada) is a candidate for listing under the U.S. Endangered Species Act (Federal Register, 7 May 1993, 2 April 1998).

USDA-Forest Service (Region 6) Status: Sensitive (USFS 2000)
Oregon State Status: Undetermined Status (ORNHP 2000)
Oregon Natural Heritage Program Status: List 3 (ORNHP 2000)

Conservation Status Ranking
(NatureServe 2000)

- **Global Rank= G4T?Q**
- **Oregon State Rank=S2?**

Major Threats

Great Basin population has been adversely affected by habitat degradation resulting from mining, livestock grazing, road construction, agriculture, and direct predation by bullfrogs and non-native fishes (NatureServe 2000).

Degree of Threat

Moderately threatened range-wide, habitat or community lends itself to alternate use

Population Status and Trend

Recent intensive surveys indicate severe declines in the Great Basin populations.

Fragility

Fairly resistant and tolerant of nondestructive intrusion.

Habitat

Spotted frogs are highly aquatic; and are rarely found far from permanent water. They are usually found along the grassy margins of streams, lakes, ponds, springs, and marshes. Breeding habitat is usually in shallow water in ponds or other quiet waters along streams. Breeding may also occur in flooded areas adjacent to streams and ponds. Adults may disperse overland in the spring and summer after breeding

Distribution

Green et al. (1997) determined that frogs from the vicinity of the type locality of *Rana pretiosa* (Oregon spotted frog) are conspecific with the species residing in south-central Washington and the Cascade Mountains of Oregon. They concluded that populations from southwestern British Columbia, western Washington, western and central Oregon, and northeastern California are Oregon spotted frog whereas spotted frogs from the remainder of the range are Columbia spotted frogs (NatureServe 2000).

This species occurs in extreme southeastern Alaska, southwestern Yukon, northern British Columbia, and western Alberta south through Washington east of the Cascades, eastern Oregon, Idaho, and western Montana to Nevada (disjunct, Mary's, Reese, and Owyhee river systems), southwestern Idaho (disjunct), Utah (disjunct, Wasatch Mountains and west desert), and western and north-central (disjunct) Wyoming. Disjunct populations occur on isolated mountains and in arid-land springs.

In Oregon, the Columbia spotted frog appears to be widely distributed east of the Cascade Mountains.

This frog is present in all subbasins on the Malheur National Forest. It is assumed widely distributed in the project area. Confirmed sightings occur in Myrtle Creek and North Fork Myrtle Creek.

Existing Condition

No habitat surveys have been conducted specifically for spotted frogs. However, habitat for spotted frogs probably has been degraded due to past management activities such as livestock grazing, road construction along streams, and timber harvest adjacent to streams, lakes ponds, springs, and marshes

Effects and Determination

Alternative 1
(No Action Alternative)

Direct and Indirect Effects:

Alternative 1 would have no short-term adverse effects to Columbia spotted frog. Current watershed conditions in upland areas are probably not having adverse affects to spotted frogs.

This alternative may have minor long-term adverse effects to spotted frogs. Current watershed conditions favor the likelihood of a severe wildfire. As fuels continue to build up due to the current stand conditions the potential for a severe wildfire would increase.

A severe wildfire could adversely affect spotted frogs though effects are expected to be minimal. Fire-caused injury to amphibians appears to be minimal (Smith 2000). Riparian habitat quality could be temporarily reduced by fire, though burns in permanent riparian habitats tend to leave patches of habitat that can be used as refuge by amphibians (Smith 2000).

Determination

Due to the nature of a no action alternative, there would be **NO IMPACT (NI)**, but there are potential minor indirect, long-term potential effects from insects, disease, and stand-replacement wildfire because of not addressing current forest heath issues. The timing and extent of these effects is unknown.

Alternatives 2, 4, 5, 7, and 7a

Vegetation Management Activities

Direct and Indirect Effects

Commercial Harvest

Commercial harvest activities would not have adverse effects to Columbia spotted frogs or their habitat. Streams would be protected with INFISH RHCA buffers. Forest Plan buffers would protect springs and ponds.

PCT, Post & Pole, Juniper Removal, Aspen Restoration (Outside of RHCAs)

These activities would not have adverse effects to Columbia spotted frogs or their habitat. Streams would be protected with INFISH RHCA buffers. Forest Plan buffers would protect springs.

Aspen Restoration (Inside of RHCAs)

This activity may result in adverse and beneficial effects to spotted frogs. Felling of trees in RHCAs may result in direct mortality to spotted frogs though this is unlikely. Beneficial effects to frogs are possible from this activity because reducing coniferous tree density could increase surface water availability, making more habitat available to frogs. No disturbance to habitat is likely to occur.

Spring and Cottonwood Restoration

This activity may result in adverse and beneficial effects to spotted frogs and their habitat. Felling of trees in RHCAs may result in direct mortality to spotted frogs though this is unlikely.

Spring development can dewater portions of the ground surrounding springs. Since frogs may be using this wet dirt as hibernation habitat, dewatering (drying up) the habitat could reduce the amount of hibernation habitat that is available (J. Wood, USFWS, pers. com. 2003). Water developments for livestock (on 3 springs [Alt 7a] or 4 springs [remaining alternatives]) would be designed so they do not dewater spring sites and therefore would not affect frog hibernation habitat.

Thinned trees left jack-strawed and fencing will reduce livestock and possibly big game

impacts at spring and cottonwood sites which would protect potential frog habitat. Reducing coniferous tree density around springs could increase surface water flows, which may result in greater water availability through the summer months, which in turn could provide more habitat for frogs.

Fuels Treatment

This activity has a low potential for causing adverse effects to spotted frogs and their habitat. Prescribed burns normally occur when fuel moistures are high. Riparian areas are not likely to burn extensively under these conditions. Riparian areas with permanent water are also not planned for active treatment with prescribed fire, so little effect to riparian habitat is expected.

Roads

This activity has a low potential for causing adverse effects to spotted frog habitat. The main adverse effects from road closing and decommissioning to aquatic habitat is an increase in fine sediment. Increases in fine sediment do not appear to adversely affect frog habitat. Road activities may cause short-term adverse effects, but decommissioning may provide mid and long term benefits by restoring habitat.

Mitigation

As described above, water developments at springs will not dewater spring areas.

Alternatives 3 and 6

Direct and Indirect Effects

Similar to the other action alternatives, PCT and juniper reduction would not have adverse effects to Columbia spotted frogs or their habitat. The affects of aspen, spring, and cottonwood restoration and fuel and road treatments would be the same as in the other action alternatives.

Cumulative Effects

The proposed vegetation management activities would begin moving vegetation back towards historical conditions and reduce the high fuel loads that have resulted from past vegetation management practices in the watershed.

Spring habitat has been altered across the forest landscape as springs were developed for livestock watering. Ongoing grazing may continue to impact habitat for this species. Munger and Engle (2000) suggest that livestock negatively impacts this species through trampling of riparian vegetation and possibly frogs. On the other hand, Hatch, Blomquist and Tracy (2000) suggest negative grazing impacts are anecodotal and grazing may benefit this species by clearing choking vegetation from stream banks. Treatments, as proposed, that enhance and protect springs and wet aspen sites should reduce any cumulative effects contributed by on-going grazing by providing enhanced habitat for spotted frog.

Determination

Timber harvest activities are not planned in wet habitats used by spotted frog. Little or no effect to frogs or frog habitat is expected from these treatments. Prescribed burn treatments and road activities have the potential to affect frogs or their habitat, though the effect is expected to be minimal. Spring and cottonwood restoration should improve water quality and may improve habitat, but the effects to frogs are not expected to be measurable. Spring developments will not dewater springs, so no effect to frog hibernation habitat is expected. Due to the potential for impacts, the action alternatives **may impact individuals and their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population of this species**.

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American peregrine falcon

(Falco peregrinus anatum)
Tunstall 1771

Status

Federal Status: N/A
On August 25, 1999 the Department of Interior, Fish and Wildlife Service determined that the American peregrine falcon is no longer an endangered or threatened species pursuant to the Endangered Species Act of 1973, as amended (50 CFR Part 17, RIN 1018-AF04). This action removes the American peregrine falcon throughout its range as an endangered species from the Federal List of Endangered and Threatened Wildlife, thereby removing all protections provided by the Act. It also removed the designation of "endangered due to similarity of appearance" or any free-flying peregrine falcons within the 48 conterminous United States.

This designation does not affect protection provided to this species by the Migratory Bird Treaty Act, the Convention on International Trade in Endangered Species of Wild Fauna and Flora, or state laws and regulations, nor does it affect the endangered listing status of the Eurasian peregrine falcon (*Falco peregrinus peregrinus*) under the Act. (USDI-Fish and Wildlife Service 1999)
USDA-Forest Service (Region 6) Status: Sensitive (USDA 2000)
State Status: Endangered (last revised 12/1998)
Oregon Natural Heritage Program Status: List 1 (ORNHP 2000)

Conservation Status Ranking

(The Association for Biodiversity Information 2000)

Global Rank= G4T3 (July 04, 1997)
National Rank=N3B, N3N (July 04, 1997)
Oregon State Rank=S1B

Major Threats

In the 1970's, peregrine falcon populations were greatly impacted by organochlorine pesticide accumulation that caused eggshell thinning. Peregrine falcons in Oregon and Washington are still adversely affected by organochlorine contaminants, which contribute to nesting failure due to eggshell thinning. During the 1998 nesting season, 24 of 51 active nest sites found in Oregon failed due to eggshell thinning and subsequent breakage and/or embryo mortality (pers. comm., J. Pagel).

Data suggest that the DDE may be residual and could continue to affect Pacific Northwest peregrine falcons for decades. Additional monitoring is needed to investigate this hypothesis and identify possible sources of contamination.

Illegal collecting of nestlings for use in falconry and incidental shooting are other major threats to recovery efforts (The Nature Conservancy 1999).

Habitat

Peregrine falcon habitat consists of nesting, perching, roosting and foraging areas. The most critical habitat component for peregrine falcons appears to be suitable nesting sites (Csuti et al 1997). Nesting occurs almost exclusively on sheer cliffs with small caves or overhangs large enough to contain three to four full-grown nestlings and is usually near water. Nesting on substitute human-made sites include ledges on tall buildings, bridges, rock quarries, and raised platforms occurs. Tree nesting is virtually unknown.

The peregrine falcon nests along the seacoast, near marshes and even in cities, but are not well suited to life in forest interiors (Csuti et al 1997).

Associated with the nest territory is a foraging area. This generally includes wooded areas, marshes, open grasslands and bodies of water within a short flying distance from the nesting area (Marshall 1992). Peregrine falcon prey consists almost entirely of birds (USDI Fish and Wildlife Service 1982).

When not breeding, peregrine falcons can occur in areas where prey concentrates. This includes farmlands, marshes, lakeshores, river mouths, tidal flats, dunes and beaches, broad river valleys, cities and airports (The Nature Conservancy 1999).

Peregrine falcons (*Falco mexicanus*) may compete with other species, particularly prairie falcon, for cliff nesting sites (USDI Fish and Wildlife Service 1982).

Distribution

This subspecies breeds across interior Alaska, south of the Brooks Range, eastward across Canada, south-central United States and the Atlantic coast. Its southern range extend includes Baja, California

and Mexico. Now absent from large areas of its historical range, particularly in the eastern United States. Successful introduction of non-native peregrine falcons have occurred in much of this subspecies historical eastern United States range (The Nature Conservancy 1999). The Pacific Coast population has increase since its near extirpation in the early 1970's (Pagel 1992).

Henny and Nelson (1981) reported that there are at least 42 historical peregrine nest sites in Oregon. Other sources indicate that there were as many as 70 historical nest sites within the state. Of these reports, one referred to a location in the Strawberry Mountain Wilderness (unverified).

Sighting of peregrine falcons are uncommon. They are often noted in the fall and spring when migrating through the forest (Pagel 1992).

Existing Condition

In 1992, surveys to identify probable nest sites were conducted on the Malheur National Forest (Pagel 1992). The potential for nests at various locations were identified and rated from no to high potential of use according to specific habitat criteria. The closest potential nest site is located within Silvies Canyon. Pagel (1992) classified this site as having a "medium" potential.

Medium potential is defined as: cliffs with an acceptable level of potential occupancy, or were otherwise low potential cliffs with a possibility of a nesting ledge that was not visible or may be suspected. Certain rock types (conglomerate, granite, sandstone, limestone) have distinct possibilities of having ledges that are not normally visible, and were usually categorized as medium, if they had the "proper" or acceptable height (Pagel 1992).

To date, there have been no recorded observations of peregrine falcon use in this area. In July, 2000 a pair of peregrine falcons with an immature were sighted near Yellowjacket Lake. The presence of an apparently successful breeding pair suggest that peregrine falcons are breeding somewhere on the Malheur National Forest.

In response to the observation of peregrine falcons in the adjacent watershed, potential nesting habitat within the Silvies Canyon Watershed was monitored twice in 2003 (once during the courtship/egg laying period and once during the hatching period). Peregrine falcons were not observed in the watershed and were not found nesting.

From a further review of available records, it was determined that there is no known occupied nesting, perching or roosting peregrine falcon habitat within the planning area. Potential nesting habitat identified in the watershed is apparently being used by a breeding pair of prairie falcons.

Effects and Determination

Alternative 1 (No Action Alternative)

Direct and Indirect Effects
Because no peregrine falcons are known to be currently using the area, activities would have no effect on this species. Under the No Action Alternative, there would be no new management activities; therefore, there would be no direct or indirect effects on peregrine falcon habitat. Ongoing grazing, prescribed burning and Forest level weed control (through manual removal) will continue

There are potential indirect, long-term effects to prey species from probable stand-replacing events, such as high intensity wildfire, that could occur because of not creating resilient forest ecosystems, but little chance of effects to cliff habitat from fire. The magnitude and timing of this potential impact is unknown, but it could drastically modify large areas of low elevation ponderosa pine habitat.

Cumulative Effects

Ongoing activities, such as livestock grazing, would continue in the project area. Grazing can reduce ground vegetation and shrubs and impact riparian habitat, which in turn can affect falcon prey species. However, managed grazing is not expected to contribute to cumulative effects on falcon prey species. Alternative 1 would maintain adequate habitat for falcon prey species in the short-term; however, habitat for falcon prey species could be substantially changed in the foreseeable future when stand-replacing events (such as a fire or insect outbreak) occur. The likelihood of such events is higher in Alternative 1 than in the action alternatives.

Determination

Because there are no peregrine falcons present in the project area and because proposed actions would not occur in the no action alternative, there would be **No Impact (NI)** to peregrine falcons or their habitat.

Effects Common to All Action Alternatives

Because no peregrine falcons are known to be currently using the area, activities would have no effect on this species. While no peregrines are known to be present, the highest potential for effects to peregrines would come from disturbance during treatments (including precommercial thinning, commercial harvest, and prescribed fire; other treatments such as aspen and spring restoration, and road decommissioning would not occur near the nest cliff). Peregrine falcon are sensitive to disturbance near the nest cliff during the breeding season (February 1 – August 15), but are most sensitive prior to egg laying (USDI Fish and Wildlife Service 1982).

The prairie falcon nest that is in the vicinity "medium potential" peregrine falcon cliff will be monitored prior to treatments if treatments are proposed within ½ mile of the nest between March 1 and July 31. If prairie falcons or peregrine falcons are found, effects from disturbance would be reduced through disturbance restrictions (prairie falcon – no treatments within ½ mile 3/1-7/31, peregrine falcon – no treatment within 1 mile 2/1-8/1) (Pagel 1990).

There are no records of peregrines foraging in or migrating through the area. While a transient peregrine falcon could fly over or migrate through the project area, the potential of the activity having a measurable effect on this species is very low. Proposed treatments will have a limited affect on falcon prey species since treatments do not occur close to the nest cliff, and treatments farther away from the nest cliff may shift the type of prey species toward dry forest species and away from moist/interior forest species, but would likely not change the amount of prey available.

Cumulative Effects

Ongoing activities, such as livestock grazing, would continue in the project area. Grazing can reduce ground vegetation and shrubs and impact riparian habitat, which in turn can affect falcon prey species. However, managed grazing is not expected to contribute to cumulative effects on falcons or their prey species. No cumulative effects are expected

Determination

Because there are no peregrine falcons present in the project area and falcon habitat would not be altered there would be **No Impact (NI)** to peregrine falcons or peregrine falcon habitat by the implementation of any alternative.

western sage grouse

southeast populations
(Centrocercus urophasianus phaios)
Bonaparte 1827

Status

Federal Status: Species of Concern (list 1-7-00-SP-588).
USDA-Forest Service (Region 6) Status: Sensitive (USFS 2000)
Malheur National Forest Status: N/A
State Status: N/A
Oregon Natural Heritage Program Status: List 3 (ORNHP 2000)

Conservation Status Ranking

(The Association for Biodiversity Information 2000)

Global Rank=G5T3Q (Nov 25, 1996)
National Rank=N3 (Jan 05, 1997)
Oregon State Rank=S3

Major Threats

Conversion of sagebrush cover types to agricultural lands and conversion of shrubsteppe vegetation to exotic forbs and annual grasses (Wisdom et al. 2000) have drastically reduced or altered the availability of this species habitat. In southeastern Oregon over 2,760 square miles of federally administered lands have been modified to the detriment of sage grouse (Willis et al. 1993).

Predation and livestock grazing contribute to the decline of sage grouse numbers.

Population Status and Trend

Prior to the 1950s, estimates of abundance were anecdotal, and historical population levels are unknown (Braun 1998). Early accounts, however, suggest that this species was once widespread and abundant in many areas of the West. There are reports of sage grouse at times blackening the sky and being shot by the wagon-load (Braun 1999b). Declines began with livestock overgrazing of western rangelands aggravated by over harvesting and periods of drought. By the 1920s and 1930s sage grouse were thought to be declining throughout their range (Braun 1998). Population declines have

continued to present day with accumulating loss and degradation of sagebrush habitats.

Distribution has contracted by approximately 50 percent since European settlement, and these species has been extirpated from five states and one province (Kansas, Nebraska, Oklahoma, Arizona, New Mexico, and British Columbia) (Braun 1998).

Wisdom et al. (2000) reports that sage grouse populations have shown significant, steep declines since the 1940s in Idaho, Oregon and Washington. The rates of decline in Idaho, Oregon, and Washington are not significantly different, suggesting common, widespread factors affecting these populations. In Oregon, long-term population declines have averaged 30 percent since 1950. (Interagency Interdisciplinary Sage Grouse Planning Team 2000 "draft")

Braun (1998) estimates a current total of fewer than 142,000 grouse rangewide, and population levels for each state and province as follows:

Estimated 500 in Alberta and Saskatchewan.
Fewer than 2,000 in North Dakota, South Dakota, and Washington.
Fewer than 5,000 in California.
Fewer than 15,000 in Colorado and Utah.
Fewer than 20,000 in Idaho and Nevada.
Fewer than 20,000 in Montana, Oregon and Wyoming.

A complicating factor is that sage grouse in this geographic area may exhibit population cycles with a periodicity of around 10 years. Apparent trends over short periods should be regarded with caution. Nonetheless, trends for populations in Colorado, for example, reveal that each population peak has been lower than the last (Braun 1999b). There have been no sustained population increases in any part of the range (Braun 1998).

Source Habitat Trend

The current extent of habitat is similar to the historical distribution, although the abundance of habitat has changed in some areas. Basin-wide, nearly 48 percent of the watersheds showed a moderate or strongly declining trend in habitat, and declines exceeded increases in every ERU. The Blue Mountains ERU has undergone a negative absolute (-11.73% and -12.70%) and relative (-30.14% and -32.78%) change in winter and summer source habitat availability (Wisdom et al. 2000).

Habitat

Sage grouse are obligate residents of sagebrush habitat, usually inhabiting sagebrush-grassland or juniper-sagebrush-grassland communities. Throughout their range habitats used includes a wide variety of sagebrush mosaic habitats, including: (Schroeder et al. 1999)

tall sagebrush types such as big sagebrush, three-tip sagebrush (*A. tripartita*), and silver sagebrush (*A. cana*);
low sagebrush types, such as low sagebrush (*Artemesia arbuscula*) and black sagebrush (*A. nova*);
mixes of low and tall sagebrush with abundant forbs;
riparian and wet meadows;
steppe dominated by native forbs and bunchgrasses;
scrub-willow (*Salix* spp.)
sagebrush/woodland mixes with juniper (*Juniperus* spp.), ponderosa pine (*Pinus ponderosa*),or quaking aspen (*Populus tremuloides*).

In southeastern Oregon, the most widely used vegetation type throughout the year is forb-rich sagebrush types with low stature sagebrush, and mosaics of low and high stature sagebrush (Willis et al. 1993). Vegetation types of low stature primarily include low sagebrush (*A. longiloba*), although black sagebrush, stiff sagebrush (*A. rigida*), and three-tipped sagebrush may be used. Wyoming big sagebrush (*A. t.* var *wyomingensis*) and mountain big sagebrush (*A. t.* var *vaseyana*) are the primary species of high stature used in mosaic form with low sagebrush in Oregon. Neither expansive dense sagebrush nor expansive open areas constitute optimal sage grouse habitat.

Sage grouse use sagebrush of different age classes and stand structures for lek (courtship display), nesting, brood rearing, and wintering.

During the mating season (February-May), leks may be on bare areas, such as swales, irrigated fields, meadows, burns, and roadsides (Call and Maser 1985), or areas of low cover and stature of sagebrush and are more often within vegetation types of low sagebrush or low/big sagebrush mosaics. When not on the lek, sage grouse disperse to the surrounding areas (Wallestad 1975).

After mating, hens usually nest near lek grounds (usually within 2 miles), but some fly as far as 12 to 20 miles (19-32 km) to favorable nesting sites (Call

and Maser 1985). They prefer sagebrush 14 to 25 inches (36-63.5 cm) tall with an open canopy, 10-50%, for nesting (Klebenow 1973). During the nesting season, cocks and hens without nests use relatively open areas for feeding, and roost in dense sagebrush patches (Klebenow 1969).

Early brood rearing occurs near the nest site depending on the availability of forbs and insects, which are the main food source for the chicks. Young broods use areas of low plant height (9 to 15 inches) and density, while older broods and adults use areas with taller plants (7 to 25 inches) (Martin 1970). Sage grouse apparently do not require open water for day-to-day survival if succulent vegetation is available, but they utilize free water if it is available.

Habitat used by summering groups generally takes three forms: mid-elevation playas and waterholes, high mountain areas, and alfalfa developments. After early brood rearing, hens with broods leave early brooding areas when forbs have dried and move to areas that still have green vegetation. There they spend the mid- and late summer period with other hens and brood groups. Hens without broods group up with other unsuccessful hens in meadow habitats. By August, most birds cluster near permanent watering sites (Klebenow 1969).

In Oregon, sage grouse movements in mid-elevational summering areas are more random.

The Interagency Sage Grouse Planning Team (2000) identify important late brood rearing habitats as sagebrush, meadows and riparian areas, dry lake beds, and agricultural lands. The optimum habitat contains a mosaic of these lands types that include at least;

40 percent of the area in sagebrush stands that are 16 to 32 inches tall with a canopy cover of 10 to 20 percnet (less than 25 percent total shrub cover) and an herbaceous understory of 15 percent grass canopy cover and 10 percent forb canopy cover

Habitat loss, predation, drought, and poor weather conditions during hatching and brooding have been cited as factors leading to poor recruitment (Mattise 1995). Sage grouse hunting is closely regulated in states where it is allowed, and is not generally cited as a factor in sage grouse decline (Autenrieth et al. 1982, Blaisdell, et al. 1982, Johnsgard 1973, Johnsgard 1983).

Sagebrush is used for hiding cover year-round and provides thermal cover during summer and winter. Vegetation types used for wintering include primarily low sagebrush, big sagebrush, and mosaics of low and big sagebrush, where the often prefer wind swept areas free of snow.

Sagebrush, used year-round, is the most important component in the diet of adult sage grouse (Beck 1975, Call 1979, Call and Maser 1985, Klebenow 1973, Patterson 1952, Schneegas 1967, Sime 1991, Wallestad 1975, Wallestad et al. 1975). Sagebrush constituted less than 60 percent of the diet only between June and September (Wallestad 1975). Other forage consists largely of herbaceous leaves of dandelion *(Taraxacum* spp.), legumes (*Fabaceae*), yarrow (*Achillea* spp.) and wild lettuce (*Lactuca* spp.), which is used primarily in late spring and summer (Edminster 1947, Autenrieth et al. 1982, Sime 1991). Insects are a minor diet item for adult sage grouse. Chicks consume primarily insects, especially ants and beetles, in their first week of life (Patterson 1952). Their diet then switches to forbs, with sagebrush gradually assuming primary importance.

Existing Conditions

There are no known leks in the Silvies Canyon Watershed. A potential transitional lek site (a site used only in years with little snow) was recently reported just south of the analysis area. This site has not been confirmed as a lek and in most years would be covered in snow during the courtship/mating season (R. Vetter pers. com. 2003). Active grouse leks have been found further south of the watershed than the potential lek site. Additional leks may occur in the Silvies Valley but have yet to be located.

Sage grouse may nest inside the project area in patches of sagebrush, most likely, within two miles of the reported lek (Call and Maser 1985). 938 acres of dry shrub habitat occur within 2 miles of the reported lek, though all acres are not necessarily sagebrush or nesting habitat. Potential “marginal quality” late season brood rearing habitat/summer sagebrush-steppe habitat exists in the south end of the watershed. Hens with broods or hen groups may use these sagebrush-steppe/meadow/ephemeral wet riparian areas as lower elevation sagebrush types dry up and herbaceous plants mature. No information is currently available on use of the project area for nesting.

There is one documented occurrence of sage grouse in the watershed. It is likely that adult sage

grouse with young occasionally use the non-forested portions of the watershed. There is no key late brood-rearing habitat identified in the watershed. Use appears to be occasional and random within suitable habitat.

Effects and Determination

Alternative 1 (No Action Alternative)

Direct and Indirect Effects

Under the No Action Alternative, there would be no new management activities; therefore, there would be no direct or indirect effects to sage grouse or their habitat. Ongoing grazing, prescribed burning and Forest level mechanical and manual weed control will continue

Current levels of noxious weeds in the watershed are probably below threshold levels that can cause measurable changes in terrestrial habitat. Over the long-term, degradation of foraging habitat may be impacted by encroaching noxious weeds.

Cumulative Effects

More suitable nesting habitat is available in abundance outside the project area south of the reported lek. This habitat should continue to provide additional sage grouse habitats since there are no reasonably foreseeable treatments known in this habitat. Grazing would continue to occur in areas that may occasionally be used as late brood-rearing habitat. Grazing could affect sage grouse foraging success by reducing ground vegetation and shrubs. At moderate grazing levels, livestock grazing can be compatible with sage grouse management.

If sage grouse are verified at the reported lek and determined to be using the project area for nesting, sage grouse habitat could be analyzed and managed through another project aimed specifically at managing habitat for this species.

Determination

Due to the nature of a no action alternative, there would be **No Impact (NI)**.

Direct and Indirect Effects Common to All Action Alternatives

Vegetation Management

Most vegetation management proposed would not affect this species. Known and reported leks would not be treated, and therefore not be affected, since leks are outside the project area. Juniper reduction in lower elevation dry ponderosa pine/shrub steppe areas may increase the availability of late brood-rearing habitat by removing encroaching conifers from historically non-forested areas. After burning and conifer removal, existing perennial grasses and forbs should increase in vigor and expand in restored non-forested areas.

Fuels Management

Burning would not impact grouse in or near potential or known lek sites because lek sites would not be treated and would be actively protected from treatment. Since the potential lek is ¼ to ½ mile outside of the project area (and therefore ¼ to ½ mile from proposed burning), effects to the lek are not expected. However, during burning operations, firefighters would actively suppress any prescribed fire spread along the southern border of project area (using methods such as an ATV-mounted sprayer) to assure that prescribed fire does not spread into the sagebrush/lek habitat that is south of the project area.

Although nesting birds have not been observed in the project area, 938 acres of possible nesting habitat do occur within 2 miles of a reported lek. If nesting is determined to be occurring in the project area, the Malheur Forest would conduct prescribed burning in Burn Block #6 and in any areas with known nesting sage grouse during the fall to eliminate the potential to affect nesting sage grouse. Fall burning could flush birds, but would not negatively impact nests or nesting success since grouse would be fledged by the time burning occurs.

In addition to timing restrictions, within two miles of the reported lek (that occurs south of the southern border of the project area) and in any areas with known nesting sage grouse, no hand lighting would occur in sagebrush habitats 1/4 acre or larger. In aerial ignition, sagebrush stands of 2 acres and larger would be identified and attempts would be made to not put any direct ignition into them. Fire would be allowed to back or creep into up to 15% (in area) of these stands (Kilpatrick no date). These measures would avoid affects on nesting sage grouse and would have a minor benefit on nesting habitat by creating a mosaic of sagebrush and grassland habitat in treated areas (Kilpatrick no date, Call and Maser 1985).

Early spring and fall burning would not affect

potential sage grouse use of late brood rearing habitat since burning would not occur when sage grouse could be using this habitat. Similar to nesting habitat, burning could provide a slight improvement in brood rearing habitat.

Noxious Weed

The Interagency Sage Grouse Planning Team (2000) recommends aggressive treatment of noxious weeds and other invasive plants to protect or restore habitat. Proposed selective treatment of noxious weeds may benefit this species on a very limited basis.

Direct disturbance from weed control activity may occur in nesting and foraging habitat. This disturbance is expected to be of low level and short duration. With the majority of documented weed sites adjacent to roadsides, disturbance from weed treatment would be similar to disturbance from road use and is expected to affect few, if any, individuals. There would be no effects at the population level. All treatment would be manual so no effect from chemicals would occur.

There are no indirect effects because of weed control. There is low potential for any habitat changes in this watershed large enough to affect sage grouse habitat or prey base.

Road closures would reduce the road-associated effects on sage grouse and their habitat. Other proposed activities (such as old-growth reconfiguration, spring restoration, and aspen restoration) may provide enhanced habitat diversity, but would have no measurable effect on sage grouse or their habitat.

Cumulative Effects

Cumulative effects would be similar to those discussed in the no action alternative.

Determination

Activities proposed under these alternatives are expected to provide minor benefits to potential late brood-rearing habitat and to potential nesting habitat. Activities proposed would have no effect on lek or potential lek habitat. Although no sage grouse are currently known to inhabit the project area, prescribed burning would be done outside of the nesting season to avoid affecting potential nests or nesting birds. Prescribed burning could cause sage grouse to be disturbed, but sage grouse are expected to escape the fire.

Due to the potential for impacts, the action alternatives may impact individuals and their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population of this species. Potential impacts are minor and would be an overall benefit to this species. The level of proposed treatment represents only a small percent of sagebrush habitat available in the watershed. At this level, restoration would be slightly increased at the local level, but not at the landscape level.

gray flycatcher

(Empidonax wrightii) Baird 1858

Status

Federal Status: N/A
USDA-Forest Service (Region 6) Status: Sensitive (USDA 2000)
State Status: N/A
Oregon Natural Heritage Program Status: N/A

Conservation Status Ranking

(NatureServe 2000)

Global Rank= G5 (December 2, 1996)
National Rank=N5B, NZN (March 19, 1997)
Oregon State Rank=S4

Major Threats

This species would be vulnerable to land clearing, but generally found in very arid environments that are not usually converted to agriculture (USDA Forest Service 1994). Clearing of pinyon-juniper in favor of grassland for livestock grazing or widespread harvesting of pinyon-juniper could be detrimental.

Population Status and Trend

North American BBS (Breeding Bird Survey) shows a survey-wide significantly increasing trend of 10.2 percent average per year (n = 89) during the 1966-1996 sample period; a nonsignificant decline of -1.0 percent average per year (n = 22) during 1966-1979; and a significant increase from 1980 to 1996 of 10.0 percent average per year (n = 84) (Sauer et al. 1997).

Data for Oregon reflects a strong long-term increase of 7.9 percent average per year (n = 29) during the 1966-1996 period (Sauer et al. 1997).

Habitat

The gray flycatcher prefers relatively treeless areas with tall sagebrush, bitterbrush, or mountain mahogany communities, but is also associated with pinyon-juniper woodland with understory sagebrush, open ponderosa pine forests (Csuti et al. 1997). This species in most abundant in extensive tracts of big sagebrush, often selecting areas along washes where the sagebrush is especially tall. In the western Great Basin, this species nests in tall big sagebrush shrublands (Ryser 1985).

During the nonbreeding season, this species commonly winters in arid scrub, riparian woodland, and mesquite (NatureServe 2000).

Distribution

Breeding range covers extreme southern British Columbia and south-central Idaho south to southern California, southern Nevada, central Arizona, south-central New Mexico, and locally western Texas (NatureServe 2000).

In Oregon, this species is typically found east of the Cascade Mountains (Csuti et al. 1997).

Birds winter in southern California, central Arizona, south to Baja California and south-central mainland of Mexico (NatureServe 2000).

Existing Condition

Confirmation of the presence and general abundance (0.01 birds/route-very low abundance) (USGS 2000) of gray flycatchers was done for the Silvies Valley during roadside abundance surveys on BBS route **Ore-248: Silvies**. Presence and density information is not available for the Silvies Canyon Watershed.

An analysis of potential habitat was conducted using current data to determine the potential for presence. GIS analysis indicates that there are about 10,691 acres of shrublands in Silvies Canyon Project area. Most of this acreage occurs in the south end of the watershed.

The bulk of the acres were classified as generic dry shrublands (8,770 acres). Mountain Mahogany (936 acres) and wet grasslands/shrub-meadows (664 acres) make up the remaining large classes of the acreage classified. Several additional shrubland associations are present but are minimally represented.

While not all of the shrubland/nonforested areas found in the watershed provide habitat for this species, much of the shrubland habitat is potential habitat. Gray flycatchers can be considered fairly widespread in the south end of the watershed.

The Malheur National Forest considers this species as a rare (not seen every year) summer resident. Marshall et al. (2003) shows confirmed breeding of gray flycatchers in the general area of the Silvies Canyon project.

Effects and Determination

Alternative 1 (No Action Alternative)

Direct and Indirect Effects

Under the No Action Alternative, there would be no new management activities; therefore, there should be no direct or indirect effects on gray flycatchers or their habitat. Ongoing grazing, prescribed burning and Forest level weed control (through manual and mechanical removal) will continue.

Noxious weeds are not known to occur in these habitats. Current levels of noxious weeds in the watershed are probably below threshold levels that can cause measurable changes to shrubland habitats. Over the long-term, degradation of habitat may be impacted by encroaching noxious weeds.

Determination

Due to the nature of a no action alternative, there would be **No Impact (NI)**. Juniper woodlands would remain in their current “status quo” condition. Open juniper woodlands have the greatest potential for maximum structural diversity and habitat potential when all layers are present (Miller 1999). Over the long-term, maintaining juniper dominated sites fails to restore resilient and healthy arid shrubland habitat that favors the gray flycatcher and other open-grassland and shrub-steppe adapted species.

There are potential indirect, long-term effects from probable high intensity wildfire that could occur because of not creating resilient forest and shrubland ecosystems. The magnitude and timing of this potential impact is unknown, but it could

drastically modify large areas of arid woodland shrublands and low elevation ponderosa pine habitat.

Due to the loss of sagebrush and other shrubs from stand-replacing fire, this could adversely impact gray flycatchers in the short term. As the shrub and understory layer recovers from the effects of a fire, this species would greatly benefit from the creation of relatively treeless grassland/shrub-steppe areas.

Alternatives 2, 3, 4, 5, 7, and 7a

Direct and Indirect Effects

Silvicultural Practices

Preliminary analysis by Miller et al. (1999) shows avian diversity among different communities types is greatest in mid-successional shrub-steppe woodland communities and open old growth juniper. These alternatives were developed to convert 515 to 715 acres (Table 8.) of closed canopy juniper stands to an open mid-successional stage with remnant old juniper structure.

Table 8. Juniper Treatment by Alternative.

Alt	acres treated	method
2	537	commercial (where viable) and non-commercial
3	515	non-commercial
4, 7, and 7a	715	commercial (where viable) and non-commercial
5	535	commercial (where viable) and non-commercial

Direct and Indirect Effects

Silvicultural Practices

Gray flycatcher may nest 2-5 feet up in shrubs, trees, or in juniper trees that are to be thinned. They would be vulnerable to loss of nest productivity from juniper removal if the activities occur during the nesting season. Nests, eggs and nestlings could be destroyed and brooding adults could be killed during felling operations (OR-WA PIF 2001). In most cases, adult birds can escape. Juniper stands would be treated outside the nesting season or will be monitored for gray flycatcher nests, and nest trees would be protected to reduce the potential for direct effects. Proposed treatment should improve habitat for open-grassland and shrub-steppe adapted species including gray flycatchers. Thinning of juniper would likely reduce below-ground competition and increased availability of soil water and nutrients to shrubs and grasses (Bates et al. 1999). This would improve foraging habitat by increasing spacing between trees, encouraging development of sagebrush, bluegrass, perennial bunchgrasses, and, annual forbs in the understory increasing total ground cover, and increasing total biomass.

Fuel Treatment

Under these alternatives, prescribed fire would be used as a follow-up treatment to remove “old” slash, kill additional young juniper in the understory, remove the buildup of dead vegetation, and release stored nitrogen back into the system.

Because of limited continuity of fuels, low to moderate burning should have little effect on remaining mature and old growth junipers, grasses, or forbs. Burning under these site conditions should result in a mosaic burn that would enhance habitat conditions for the gray flycatcher.

Road closures would reduce the road-associated effects on flycatchers and their habitat. Other proposed activities (such as old-growth reconfiguration, spring restoration, and aspen restoration) would occur outside of gray flycatcher habitat, so would have no measurable effect on gray flycatchers or their habitat.

Alternative 6

Direct and Indirect Effects

Burning to reduce created “green” fuels and kill junipers would require fire intensities that may cause substantial mortality of native perennial grasses, such as Idaho fescue and bluebunch wheatgrass, reduce seed production, and damage dormant seed reserves. This may leave the site open for colonization by cheatgrass and noxious weeds depending on preburn conditions and availability of seed (Belsky 1996). Because of negative environmental impacts, burning would be done at low to moderate intensity, not at the intensity that would kill junipers.

Because of limited continuity of fuels, low to moderate intensity burning should have little effect on most of the juniper present in the units. While burning may reduce a small number of young juniper and would positively influence some understory

vegetation, burning is not expected to reduce larger juniper and the positive influence of burning would be relatively short term. Without a substantial reduction in the density of junipers, these areas would not show significant change in habitat over the long-term. Effects would be similar to Alternative 1.

Cumulative Effect

Currently, so little is known about the effects of juniper control on complex environmental attributes that it is difficult to predict how a given site would respond to treatment. Response of arid and semi-arid northwest communities to juniper control are typically site specific. A preponderance of current research indicates that juniper removal would increase the productivity of understory shrubs and herbaceous plants on most sites.

In some cases, juniper management can encourage undesirable weedy annuals and shrubs. This usually occurs if a weed source is already present or if ground disturbing activities or prescribed burning damages desired native understory vegetation. Weed sources are not known to occur in these habitats and the goal of these alternatives is to improve arid shrubland habitat conditions without creating negative environmental impacts. Prescription perameters and noxious weed mitigation measures were designed to restore desired native vegetation without excessive damage or loss and to reduce the risk of spreading weeds, thereby avoiding or limiting establishment of undesired vegetation.

Determination

Due to the potential for impacts, the action alternatives may impact individuals and their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population of this species. Potential impacts are minor and would be an overall benefit to this species. The level of proposed treatment represents only a small percent of juniper habitat available in the watershed. At this level, restoration would be slightly increased at the local level, but not at the landscape level

bufflehead

(*Bucephala albeola*) Linnaeus, 1758

Status

Federal Status: N/A
Forest Service (Region 6) Status: Sensitive (USDA 2000)
State Status: N/A
Oregon Natural Heritage Program Status: N/A

Conservation Status Ranking

(NatureServe 2000)

Global Rank= G5 (November 21,1996)
National Rank=N5B, N5N (January 05, 1997)
Oregon State Rank=S2B, S5N

Major Threats

Loss of nesting trees near mountain lakes and hunting pressure are major threats. This duck is currently a game species in Oregon.

Population Status and Trend

Only several hundred pair are thought to breed in Oregon (Csuti et al. 1997).

Habitat

Breeding habitat for bufflehead includes lakes, ponds, rivers and seacoasts (NatureServe 2000). In Oregon, this duck nests near mountain lakes surrounded by open woodlands containing snags. In many areas, the preferred nest trees are aspen, but it will also nest in ponderosa pine and Douglas-fir snags (Csuti et al. 1997).

During the non-breeding/wintering season, bufflehead can be found in sheltered bays and estuaries along the Oregon Coast as well as open freshwater lakes, reservoirs and major rivers.

Distribution

This northern species breeds from Alaska across Canada and south to Oregon, northern California, and Wisconsin.

In Oregon, breeding season distribution is limited to the Cascade Mountains from the northern boundary

to the Klamath Basin (Csuti et al. 1997).

During the non-breeding season, bufflehead can be found in the Aleutians, Alaska Peninsula, Great Lakes, New Brunswick and Newfoundland, south to Baja California, mainland Mexico, the Gulf Coast, Florida; and occasionally in Hawaii. The most abundant wintering populations include those around Vancouver Island, along the Atlantic coast from the Bay of Fundy to Chesapeake Bay, and in northern California-southern Oregon, Mississippi, eastern New Mexico (NatureServe 2000).

Existing Condition

This species does not occur on the Malheur National Forest during the breeding season (USGS 2000, Csuti et al. 1997), but migrating/overwintering birds can be found on Yellowjacket Reservoir, Delintment Lake, and the Silvies River.

Sensitive Fish

Surveys were conducted in the Silvies Canyon watershed during 1998 and 1999. PFC (proper functioning condition) surveys were conducted in the fall of 1998 (BLM 1998). Presence/absence surveys were conducted in the summer of 1999 to refine the distribution of fish in the watershed.

Great Basin redband trout

Population 18
(Oncorhynchus mykiss spp.) Walbaum 1792

Status

Federal Status: Species of Concern (list 1-7-00-SP-588).
Forest Service (Region 6) Status: Sensitive (USFS 2003)
Malheur National Forest Status: management indicator species
State Status: Vulnerable-Listing of Species is not believed to be imminent and can be avoided (ODFW 1997).
Oregon Natural Heritage Program Status: List 3 (ORNHP 2000)

Effects and Determination

Common to all Alternatives

This species does not breed in the Silvies Canyon Watershed and there is no breeding habitat present therefore there would be **No Impact (NI)** to breeding birds or breeding habitat regardless of the alternative selected.

This duck can be found in the watershed during the fall and possible spring migration and some birds may overwinter depending on the availability of open water. All activities proposed in the action alternatives occur outside RHCAs. Proposed alternatives would no alter overwintering habitat used by the bufflehead. There would be **No Impact (NI)** to non-breeding birds regardless of alternative selected.

Conservation Status Ranking

The Association for Biodiversity Information 2000)

Global Rank=G5T2Q (Sept. 02, 1998)
National Rank=N
Oregon State Rank=S3

Major Threats

In the Great Basin, agricultural development has resulted in extensive diking, channeling, draining, and loss of marshlands. Irrigation diversions have been constructed on most streams, causing habitat dewatering and physical blockage for both upstream and downstream migration trout. Because of these developments, lake and marsh trout rearing habitat has been lost and population productivity has been compromised. Timber harvest, livestock grazing, and road building have adversely affected aquatic habitats in forested areas and rangelands throughout the range of Great Basin redband trout (USFWS 2000).

The introduction of nonnative fish species such as brook trout and smallmouth bass, and the stocking of hatchery rainbow trout have also negatively impacted this species (USFWS 2000).

Habitat

There are four different populations of redband trout in the Blue Mountains. These are: 1) sympatric populations with steelhead, 2) isolated allopatric populations in anadromous watersheds, 3) allopatric

populations in the Great Basin portion of the Blue Mountains, and 4) allopatric populations in watersheds that formally supported anadromous populations (N.F. Malheur and Upper Malheur Rivers). There is little data on current population trends of the redband trout, however, the four population types do not face the same level of threats from management activities. Subpopulations of the Great Basin redband trout are probably at the greatest threat of being listed as threatened under the ESA. Redband trout in the project area are of the Great Basin population. Overall, the Interior redband trout have the most extensive area of all game fishes in the Blue Mountains. They are in the smallest headwater areas as well as in the largest rivers of the Blue Mountains.

Native trout found in the internal basins of Oregon are redband trout derived from the Columbia River system. Malheur Lake Basin is the largest of the Oregon desert basins and contains the greatest amount of trout habitat associated with the Great Basin population. The Silvies River is one of six sub-basins feeding into the lake. Basin fish fauna show little difference from the Columbia River fauna, suggesting a rather broad and geologically recent connection between Malheur Lake and Malheur River; which flows east into the Snake River system. Berg (1987) found a relatively high frequency in genetic likeness between the Silvies River and the Columbia River sub-groups. J.O. Snyder was the first researcher to sample Malheur redband trout in 1904, taking them from the Silvies River and Silver Creek.

It is not known if pure native trout populations exist in the Malheur basin (Behnke 1992). The last specimen collected that was thought to be pure native came from Smyth Creek in 1968. Hatchery introduction has occurred across the basin in years past and native redband trout face constant hazards in the high desert environment. The Silvies Canyon Project Area's climatic extremes of high summer temperatures and low flow conditions frequently produce oxygen depletion in the water. Malheur redband trout are a genotypic sub-species adapted to these unstable, harsh, environments and because they are more adapted to variable water conditions, they probably have resisted hybridization with hatchery fish or native cutthroat. Observations in the Silvies watershed have verified this adaptive nature by finding redband trout in some very marginal waters late in the summer. They tend to be small in size and are better suited for the microhabitats being maintained by base flows of less the 0.3 cfs. Hatchery rainbows would not be able to tolerate the harsh water conditions.

Interior redband trout (sensitive) are assumed to be the resident form of the anadromous steelhead. Most redband trout spawning and rearing occurs in the second to fourth order streams in the forested environment. Even when small streams are not accessible to migrating fish because of barriers or steep gradients, they are vitally important to the quality of downstream habitats.

Redband trout of the interior Oregon basins inhabit isolated desert watersheds that vary widely in size. Populations residing in small isolated streams are vulnerable to climatic fluctuations and habitat disturbance due to their isolation from neighboring streams. During wet years, marshes and lakes can provide connections between populations of adjacent streams.

Redband trout are sensitive to changes in water quality and habitat. Redband trout of interior Oregon basins are believed to be best adapted to cold (<21° C), clean water, but possess a hereditary basis to function at high temperatures (Behnke 1992). Adult redband trout are generally associated with pool habitats, although various life stages require a wide array of habitats for rearing, hiding, feeding, and resting. Pool habitat is important refugia during low water periods. An increase in sediment lowers spawning success and reduces the quantity and quality of pool and intersticial habitat. Other important habitat features include healthy riparian vegetation, undercut banks and LWD (large woody debris).

Spawning occurs during the spring, generally from March to June. Redds tend to be located where velocity, depth and bottom configuration induce water flow through the stream substrate, generally in gravels at the tailouts of pools. Water temperatures influence emergence of fry, which is typically from June through July.

Distribution

Interior redband trout are widely distributed across Oregon east of the Cascade Mountains and in the Klamath Basin (Behnke 1992). The U.S. Fish and Wildlife Service has classified the populations of redband trout inhabiting the Great Basin as a single distinct population segment (DPS) (USFWS 2000). This DPS is referred to as the “Great Basin redband trout DPS”. The range of Great Basin redband trout in Oregon includes the Warner, Catlow, Goose Lake, Fort Rock, Chewaucan, and Harney basins.

Great Basin redband trout are widely distributed in the Silvies and Harney-Malheur Lakes subbasins on the Emigrant Creek and Blue Mountain Ranger Districts of the Malheur National Forest.

This species is widely distributed in the project area, occupying the majority of perennial streams found within the watershed. They also move seasonally in the spring into many of the intermittent streams.

Existing Conditions

Stream surveys have been completed in 8 of 14 fish bearing streams in the project area. The majority of surveyed reaches are not meeting Forest Plan riparian management objectives (RMOs) for pool habitat, LWD, and fine sediment (Miller, Fisheries Specialist Report; and Goodman, Hydrologist Specialist Report). Myrtle Creek and tributaries upstream of Forest Service Road 31 have high amounts of fine sediment. Sagehen Creek also has high amounts of fine sediment. No current data on stream shading is available, although high stream temperatures indicate stream shade is lacking. Myrtle Creek does not meet Oregon water temperature standards and is on the State's 303(d) list. High water temperatures are also present in the Silvies River.

Malheur mottled sculpin

(Cottus bendireii) Girard 1850

Status

Federal Status: Species of Concern (list 1-7-00-SP-588).
Forest Service (Region 6) Status: Sensitive (USFS 2000)
Malheur National Forest Status: management indicator species
State Status: Critical (ODFW 1998).
Oregon Natural Heritage Program Status: List 3 (ORNHP 2000)

Conservation Status Ranking

(The Association for Biodiversity Information 2000)

Global Rank=G5T3Q (Aug. 28, 1996)
National Rank=N3 (Dec 05, 1996)
Oregon State Rank=S3

Major Threats

Major threats to the Malheur mottled sculpin include destruction, modification and contraction of habitat from livestock grazing, timber harvest, and water withdrawals.

Habitat

The Malheur mottled sculpin requires cool-water streams with large gravel or rubble substrates for cover and spawning. It requires water temperatures below 26°C with high dissolved oxygen and low turbidity. Malheur mottled sculpin are sensitive to changes in water quality including increases in water temperature and sediment. Spawning occurs in the spring generally from February through May. Sculpin attach their eggs in clumps to the underside of stones. Eggs hatch in about 4 weeks.

Distribution

The taxonomy of mottled sculpin (*Cottus bairdi* complex) in Harney County, Oregon was recently reviewed by Markle and Hill (2000). Based on available literature and current data, Markle and Hill support recognition of two species, Malheur mottled sculpin (*C. bendirei*) and Columbia mottled sculpin (*C. hubbsi*). The regional foresters sensitive species list recognizes the Malheur mottled sculpin as *Cottus bairdi* but recent literature recognizes the species as *Cottus bendirei,* which will be used in this report. Both species occur in northern Harney Basin and hybrids were found at contact zones in the Silver and Silvies Rivers. The Columbia mottled sculpin appears dominant in the mainstem of the Silvies River with the Malheur mottled sculpin found upstream and in isolated creeks. The Malheur mottled sculpin was the only species found in southern Harney Basin. Recent fish surveys found sculpin species form this complex in one stream in the project area, the lower reach of Myrtle Creek. Previous surveys found this species in the Silvies River, within the project area.

Both species also occur outside Harney Basin in the Malheur and Snake Rivers, lower Columbia Basin, and probably the upper Columbia Basin.

The Malheur mottled sculpin was first reported in Rattlesnake Creek near Camp Harney but, apparently disappeared from that locality about 1960 (Bond 1983). Malheur mottled sculpin populations are currently reported to be present in Smyth Creek, Riddell Creek, Poison Creek, Devine Creek, upper

Silver Creek, Donner und Blitzen River, Silvies River, and in the Malheur River system. The composition of fish from the Silvies River has changed dramatically from predominantly *hubbsi* forms in 1955-68 to predominantly *bendirei* and intergrades more recently.

There is a possibility that these sculpin represent a single polymorphic species or ecotype. Markle and Hill (2000) reject this hypothesis because the congruence of morphology and distribution was consistent with two species meeting in a narrow hybrid zone. A better understanding of reproduction, development and the dynamics of sculpin hybrid contact zones is needed o resolve this question.

Existing Conditions

Mottled sculpin require water temperatures below 26°C with high dissolved oxygen and low turbidity. They are found in streams with moderate to rapid current and are associated with rubble, gravel, or rocky bottoms. They seldom are found in silted areas. Malheur mottled sculpins are sensitive to changes in water quality including increases in water temperature and sediment. Spawning occurs in the spring generally from February through May. Females deposit adhesive eggs in a crevice or under rocks in clusters of 20 to 150. The male guides her to the nest area and guards the nest after she leaves the area. The female produces from about 50 to 300 eggs, depending on her size. Eggs hatch in about 4 weeks. They feed on a variety of aquatic invertebrates, mostly insects, but also shrimp, snails, fish eggs and fish fry. They were thought to be serious predators of trout eggs and fry, but results of studies on their food habits have revealed that few trout eggs or fry are actually eaten. Mottled sculpins are much more important as forage for trout.

Sculpin are a bottom dwelling fish that generally favor streams dominated by riffles or glides with cool water and clean, silt free, gravels, although the "bairdi" complex can tolerate temperatures up to 70 degrees F. Many of the streams within the project area do not meet the preferred habitat conditions; therefore, water temperature is more likely a key factor in structuring and controlling seasonal distribution patterns.

Stream surveys have been completed in 8 of 14 fish bearing streams in the project area. The majority of surveyed reaches are not meeting Forest Plan riparian management objectives (RMOs) for pool habitat, LWD, and fine sediment (Miller, Fisheries Specialist Report; and Goodman, Hydrologist Specialist Report). Myrtle Creek and tributaries upstream of Forest Service Road 31 have high amounts of fine sediment. Sagehen Creek also has high amounts of fine sediment. No current data on stream shading is available,although high stream temperatures indicate that stream shade is lacking. Myrtle Creek does not meet Oregon water temperature standards and is on the State's 303(d) list. High water temperatures are also present in the Silvies River.

Combined Effects and Determination for Redband Trout and Malheur Mottled Sculpin

Alternative 1 (No Action Alternative)

Direct and Indirect Effects

Under the No Action Alternative, there would be no management activities; therefore, there would be no direct effects to redband trout and Malheur Mottled Sculpin habitat. However there would be indirect effects as described below.

Most of the forested stands in the project area are identified as moderate to high risk for stocking induced mortality and related infestation of pests or disease. Without silvicultural treatment and/or the controlled re-introduction of fire into the project area, current stand conditions would worsen and increase the chance of a stand replacement fire. A stand replacement wildfire would result in the loss of shading along stream channels, loss of instream wood structures, and short-term (3-5 years) loss of streamside vegetation. This could adversely affect redband trout and Malheur mottled sculpin habitat. In addition, localized extirpation of these fish could occur as the result of severe wildfires (Rinne 1996).

Roads would not be treated in this alternative, which would allow about twelve specific roads (R.Vetter and A. Miller, Silvies Existing Condition Report) to continue input of sediment into stream channels and alter fish habitat.

Current levels of noxious weeds adjacent to streams are probably below threshold levels that can cause measurable changes in aquatic habitat. Under this action, there would be no direct or indirect adverse impacts to aquatic species or habitats during the 5-year Malheur National Forest Noxious Weed Control implementation period, which would include hand pulling as the only control method. Without active control, it is likely that the spread of noxious weeds

would increase during the next 10 years and begin to adversely impact redband trout and Malheur mottled sculpin habitat.

Cumulative Effects

During the past 100 years livestock grazing, weed infestations, timber harvesting activities across the landscape and stream systems, stream dewatering, fire suppression, road construction, road density, lack of road maintenance, and general road use on public and private lands have contributed to landscape changes in overland flows, and riparian and fish habitat. These changes are having negative affects on water quality, and aquatic habitat that could result in negative effects on redband trout and Malheur mottled sculpin habitat. During the past 30 years successful efforts have been made to limit resource degradation and conduct restoration projects that have stabilized and improved water quality and aquatic habitat. However, this process may require decades to restore natural drainage systems and meet INFISH/FOREST RMOs, including pool frequency, water temperature, large woody debris, bank stability, lower bank angle, and width depth ratios.

Potential effects from the no action alternative would be cumulative with effects from non-federal activities within the project area and all activities outside the project area on federal, state and private lands but within the Silvies River drainage. Aside from this project, other activities that may contribute to cumulative effects include; timber harvest activities, wildfires, livestock grazing, road use, flood irrigation, and vegetation alteration. These activities occur on an annual basis with the exception of timber harvest and wildfire and are known contributors of stream dewatering and sediment affecting water quality and aquatic species to an unknown degree.

Other large-scale timber harvest activities and wildfires within the sub-basin (35 river miles upstream of the Silvies project area) include the 8000 acre Flagtail wildfire in 2002. Between 3800 and 5000 acres would be harvested on National Forest System Lands in 2004, with no harvesting activities in RHCAs. Associated restoration projects occurring in 2003 include adding LWD to 27 miles of streams, riparian planting of hardwoods on 200 acres, coarse wood placement on 3-5 acres of sensitive soils, and decommissioning/closure of 24 miles of road. Additionally there are state permits for timber harvesting on 8540 acres of private land occurring 35 miles upstream of the Silvies Canyon watershed.

Both positive and negative fisheries effects from these upstream activities are likely to be immeasurable at the Silvies Canyon project area due to distance between project areas, numerous beaver dams, that filter out sediment and water diversions for flood irrigation that affect stream flows. over 35 miles of stream channel.

Livestock grazing and its effect on water quality (temperature and sediment) and aquatic species would continue into the foreseeable future with negative affects on fish. Several reaches on the Silvies River and Myrtle Creek systems are in a recent downward trend due to excessive forage utilization and associated bank failures. Recent grazing management has allowed some reaches to improve and develop an upward trend, however, more than half of the reaches are still classified as functioning-at-risk (see Silvies Canyon WA 2000) and contribute to higher stream temperatures and sediment, due to lack of shade and bank failure, respectively. Shading of streams has been documented as a key component in maintaining proper stream temperatures (Beschta et al., 2003).

This cumulative component and future recovery of riparian areas depends on the level of livestock use and achievement of grazing standards within the RHCAs. The outcome would influence and may offset some of the positive benefits for fisheries gained from this project. This analysis will assume that Forest Service grazing standards would be achieved in the future. Under these conditions riparian vegetation would stabilize stream banks in about 3-5 years, and produce stream shade in 5-10 years. Narrowing of stream channels requires the longest recovery period, between 10 to 50 years, but due to the high number of stream reaches currently functioning at risk, the stream channel recovery period could be longer.

The combined negative effects from a possible stand replacement fire, weed infestations and lack of road treatments resulting in shade reductions and increased sediment could alter fisheries habitat. The magnitude and timing of these potential impacts are unknown, but they would have short term (1-3 years) negative effects on fisheries habitat in this watershed. The magnitude and timing of these potential impacts are unknown, but they would have negative effects on redband trout and Malheur mottled sculpin habitat in this watershed. Left untreated these conditions in combination with similar conditions on private land within the project area and all lands outside the project area create

negative affects that could be a detriment to redband trout and Malheur mottled sculpins. However it is unlikely that these potential impacts would reduce the viability of this species in the subbasin.

Determination

As a result of the direct, indirect and cumulative long-term effects of doing nothing to actively restore and manage a healthy watershed, this alternative would have no impact in the short term (NI) but in the long term **May Impact Individuals or their Habitat but would Not Likely Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species (MIIH).**

Effects Common to all Action Alternatives

Road Activities

Direct and Indirect Effects

Sediment from roads is one of the main contributing factors degrading aquatic habitat and water quality that could affect redband trout and Malheur mottled sculpin habitat. Road closures, reconstruction or decommissioning activities are the most effective means of reducing sediment input from these roads into streams. Direct beneficial effects from road closures and decommissioning would be a decrease in chronic sediment input to streams and improved spawning and rearing habitat for redband trout and other aquatic species. Indirect beneficial effects would be an increase in large woody material recruitment and an increase canopy closure (shade) along streams as closed and decommissioned road segments re-vegetate with native conifers and hardwoods. Chapter 2 of the FEIS describes the differences in road treatments between alternatives.

Road decommissioning would remove the road from the Forest Road Transportation System and close the road at the entrances with earthen berms and/or boulders. Road surfaces would be sub-soiled to a depth of about 18” and scattered with slash to restore natural infiltration processes, allowing the reestablishment of vegetation and reducing sediment runoff. All culverts would be removed and the natural drainage channel restored. Removing culverts may result in short-term (< 1 year) sediment increases to stream channels; however, design features and BMPs would minimize these impacts. Long-term effects would include improvements to water quality, reestablishment drainage-ways and natural vegetation, and improvements to fisheries habitat and populations of aquatic species.

Permanent and seasonal road closures would close the road to motorized traffic, but it would remain on the Forest Road Transportation System. Surface erosion from these roads can be a major source of sediment to streams (Furniss et al. 1991). Sediment from unpaved roads is correlated to traffic volume; higher traffic levels result in higher amounts of sediment reaching streams (Reid and Dunne 1984). Road closures would decrease the amount of road-related sediment into streams and improve water quality and aquatic habitat. Under the action alternatives, all permanently closed roads would be treated to correct drainage problems and may require periodic maintenance to ensure they remain hydrologically stable.

Road reconstruction (Alternatives Six, Seven, and Seven-A) would improve roads through blading, realignment, new surfacing, cleaning ditches and culvert replacement to restore drainage and reduce sediment input into streams.

Maintenance activities (Alternatives Two, Four, Five, Six, Seven, and Seven-A) would occur, using BMPs, on approximately 8-200 miles of road, which would further reduce sediment input into streams throughout the project area. Alternatives Four, Seven, and Seven-A would have the greatest benefit to water quality and aquatic species from road maintenance, treating over 192 miles of road. Alternatives Two and Five would treat about 163 miles, whereas Alternative Six would treat the least amount, only 8 miles.

About fourteen temporary roads, totaling between 2.8 and 3.5 miles, would be constructed outside of RHCAs following BMPs in Alternatives Two, Four, Five, Seven, and Seven-A. No long term negative effects are expected from these roads due to the small number, and short lengths. They would also be constructed and decommissioned (at the completion of harvesting activities) following BMPs, which would minimize the ground disturbing activities and potential water runoff.

Twelve roads were identified in the project area as contributing sediment directly into streams and contributing to the degraded stream habitat conditions in the Silvies Canyon watershed (See FEIS Chapter 3).

Varying combinations of these twelve roads would be decommissioned, closed, maintained or reconstructed at various times during the

implementation phase of the project, depending on the alternative selected and the timing of the timber harvest, prescribed burning and post and pole activities in those areas. The location of the road and possible connected use for other project activities will determine the timing for treatment. Treating roads early as possible in the project timeframe would allow for maximum benefits to water quality and fisheries habitat. Roads used for harvest activities and identified for reconstruction or maintenance would be treated just before the start of harvest activities. Roads identified for decommissioning and used for timber harvest or prescribed fire activities would be treated at the completion of those activities. Roads identified for treatment that are not associated with project activities would be treated within the first 3 years of implementation, 2004-2007. The 3700117, 3700167 and 3700275 roads would be treated in the year 2007, after they are used for post and pole harvest. Chapter 4 of the FEIS displays specific road treatments, and implementation dates by alternative. Roads identified for closure would be closed at each end (following BMPs) with drainage structures along the length of the road to reduce water movement and sediment input to streams.

Treating any amount of roads would improve habitat for redband trout and the Malheur mottled sculpin. Increases in fine sediment from the existing road system could diminish interstitial habitat quality and have negative affects on fisheries habitat. BMPs and design features would minimize possible negative effects during the road treatment process.

The following discussion describes varying effects, by alternative, of road treatments on water quality and aquatic species This includes a discussion on the twelve specific roads identified as sediment sources as well as the reduction of roads within the S.F. Myrtle Creek and Heifer Creek drainages that are also contributing significant amounts of sediment into streams.

Alternative Two would correct five of the twelve specific roads identified as sediment sources, and would have less beneficial effect than the other Action Alternatives. This alternative would reduce the miles of open roads in the vicinity of S.F. Myrtle Creek to 39% of current conditions and Heifer Creek to 24% of current conditions. Additionally, this Alternative treats the least number and miles of roads in the Silvies Canyon Watershed.

Although Alternatives Three and Four would have the second greatest benefit by correcting eleven of the twelve specific roads identified as sediment sources, they would have the greatest reduction of open roads in the S.F. Myrtle Creek and Heifer Creek drainages by reducing the miles of open road to 68% and 100%, respectively. Additionally, these Alternatives treat the greatest number and miles of roads in the Silvies Canyon Watershed.

Alternative Five would be the second least effective of the action alternatives by correcting eight of the twelve specific roads identified as sediment sources. This Alternative would also reduce the miles of open roads in the S.F. Myrtle Creek and Heifer Creek drainages to 59% and 55% of current conditions, respectively.

Alternatives Six, Seven, and Seven-A would have the greatest benefit by correcting all twelve of the specific roads identified as sediment sources. However, these Alternatives would be less effective than Alternatives Three and Four in terms of reducing the miles of open roads in the S.F. Myrtle Creek and Heifer Creek drainages -- 17% and 55% of current conditions, respectively. Alternative Seven would decommission an additional 4.3 miles of FS road 035 in the Silvies-Myrtle Roadless Area.

During analysis it was documented that there are 63 miles of road identified for closure under previous Environmental Assessments that are currently open. These roads would be closed after the completion of commercial timber harvest activities in order to maintain drainage features and reduce sedimentation, as identified under previous decisions.

Upland and Riparian Vegetation

Several types of riparian habitat restoration are proposed at 46 springs under all action alternatives. Removal of encroaching conifers and junipers would have a beneficial impact by increasing the abundance and diversity of understory riparian species (grasses, forbs and shrubs) and possibly increasing water flows at springs and streams. Anecdotal reports have suggested that removal of conifers and junipers (Eddleman 1992 and Miller 2003) adjacent to springs can increase spring flows; however, little quantifiable scientific information exists to substantiate these claims (Belsky 1996). Five of these springs would be fenced to restrict livestock and protect riparian habitat for Columbia spotted frogs and other aquatic species. Four of the fenced springs would be developed and would transfer water to livestock troughs. These developments would include float valves or return

lines to prevent dewatering of the riparian habitat and potential altering of the riparian vegetation. Fencing spring sites would reduce compaction, improve water quality, and limit sediment transport into the stream network.

Cottonwood restoration is proposed under all action alternatives and would reduce conifer encroachment at the remnant cottonwood stand on upper Sagehen Creek. Conifers would be converted to standing snags or downed LWD. Effects from these activities would benefit the stream channel and fish by adding LWD to a stream reach that is deficient in LWD. Cottonwood plantings with protective cages on Sagehen Creek, Stancliff Creek and reaches on the Silvies River below the 31 road would restore a unique riparian species and benefit aquatic species and their habitat. Benefits include lower stream temperatures, improved fisheries habitat, increased deposition of organic material (leaves), and increased bank stability.

Seventy-seven noxious weed sites have been identified in the watershed and are proposed for manual treatment (hand pulling) under all action alternatives. Less than five sites are located near streams. Due to the control method, distance from streams, and relatively small size (< 25 sq. ft.), there would be no negative effects to water quality and aquatic species during the control effort. Noxious weed treatments would result in increaases in native vegetation species, stabilization of stream banks and improved stream shade, which would benefit aquatic habitat, water quality and fish.

Precommercial thinning and slash treatment, post and pole removal, juniper removal, and conifer thinning in aspen stands would reduce dense stands of timber and ladder fuels, reducing the likelihood of stand replacement fires within the project area and potential negative effects on soils and water quality (Beschta et al. 1987, and McNabb and Swanson 1990). This would also increase the amount of water available for stream flows and for remaining plants. Between 10,920 and 17,577 acres would be treated depending on the alternative selected. There would be no effects on stream shade, LWD, water quality or aquatic species. All of these activities would be conducted by hand except slash treatment of thinning material, which would be accomplished by grapple piling. These activities would be limited to areas outside INFISH RHCA buffers and result in minimal impacts to soils, surface water flows, water quality and aquatic species.

Aspen restoration within RHCAs would include converting encroaching conifers and junipers to standing snags or LWD, with hand tools. This would occur on 147 acres within RHCAs associated with category 1, 2, and 4 streams, in all action alternatives. Most of this activity is proposed on category 4 streams which are intermittent and do not affect downstream summer water temperatures. Ground disturbance would be limited to the felling of conifer trees, which would add to the LWD component, benefiting soil stabilization and reducing sediment input into streams. Due to the small size of aspen stands, the small amount of potential loss of stream shade from felled conifer trees would be minimal and short-term with no negative effects. Releasing these aspens from conifer competition and protecting them from livestock would allow the reestablishment of stream shade within 7-10 years that would benefit fish.

Prescribed Burning

Alternatives Two, Three, Four and Seven would prescribe burn 12 fuel blocks for a total of 39,277 acres in each alternative. These alternatives propose the highest amount of burning and have the greatest potential for effects from prescribed burning. Alternative Seven-A would prescribed burn 11 fuel blocks for 33,751 acres, Alternative Six, 10 burn blocks for 33,374 acres, and Alternative Five, 7 burn blocks for 25,311 acres, with corresponding levels of potential effects in each alternative. Prescribed burning activities (by aerial and ground ignition) are planned over a 10-year period to allow different combinations of spring and fall burning and allow for varying stages of vegetation growth across the landscape. There would be no aerial ignition within 300 feet of category 1 riparian areas except for incidental ignitions due to steep slopes or wind gusts. All ignitions would be allowed to back burn into the RHCAs.

Few adverse direct and indirect effects from prescribed burning are expected from these alternatives due to the gently sloping terrain of the project area, which reduces the potential for soil erosion and sedimentation. The potential for sediment transport to stream channels may occur during the first year. There is little risk of mortality to fish and other aquatic species since these burns would be initiated outside RHCAs and would only be allowed to creep into small portions of RHCAs. In the short-term (1-3 years), the prescribed fires may produce small amounts of sediment into the project area tributaries. Groundcover may be consumed in small areas of moderate to high intensity burns on upslope and riparian areas during the prescribed

burn. If this occurs, groundcover usually returns to or exceeds pre-burn levels 3-5 years in the Blue Mountains (Johnson 1998). Sediment yields, however, are expected to be insignificant for the following reasons: (1) low intensity burns, (2) timing (3) mosaic burn patterns, (4) moist/wet riparian conditions.

Commercial Harvest

Alternatives Two, Four, Five, Seven, and Seven-A propose varying levels of commercial harvest activities. Alternatives Four, Seven, and Seven-A propose the most timber harvesting activities (15,580 acres) and therefore would have the highest potential for impact. Alternative Two (15,149 acres) would have a slightly lower potential for causing adverse effects than Alternatives Four, Seven, or Seven-A. Alternative Five (11,066 acres) proposes the least amount of timber harvesting activities and therefore would have the least impact of the three harvest alternatives. No harvest or harvest related activities are proposed in the RHCAs.

Alternatives Three and Six would cause the least amount of ground disturbance in the watershed (no commercial timber harvest) and still allow varying degrees of other restoration activities to occur, including road decommissioning, precommercial thinning, juniper reduction, and aspen, cottonwood and spring restoration. However, without commercial thinning of forest stands across the watershed, dense stand conditions and high fuel levels will remain an issue, increasing the risk of stand replacement fires.

Timber harvesting and associated activities can increase peak and channel modifying flows, and can increase sediment supply from erosion and bank destabilization resulting in channel degradation (Chamberlin et al., 1991). Tree felling by itself is not usually a significant cause of increased sediment production. Timber yarding, on the other hand, can cause measurable increases in erosion through alteration of soil structure, gouging of slopes, disturbance to stream channels and modification of soil infiltration capacities. Road systems, skid trails, and landings can accelerate hillslope runoff by concentrating flow and altering the natural drainage system.

Significant increases in sediment yields to stream channels may exceed the stream's natural ability to carry the sediment load. This would result in sediment deposition as point and mid-channel bars, especially in lower gradient reaches of a stream, that would lead to wider, shallower, and less stable channels. This can result in bank erosion and bed-scour, which further increase the sediment load in the stream. These effects can be activated by initial direct introduction of sediment from outside the channel and/or increases in water yields that result in channel erosion. Increases in fine sediment can result in decreased reproductive success of fish. However, significant increases in sediment yields are not expected with any of the Action Alternatives due to the gentle terrain, design features, mitigation, and riparian protection measures (INFISH buffers).

Aquatic habitat would be buffered from effects related to commercial harvest activities by using INFISH RHCA buffers, R6 BMPs, Malheur N.F. Forest Plan standards, and INFISH standards and guides. RHCAs help maintain the integrity of aquatic habitats by buffering stream channels from non-channelized sediment delivery, and providing for other riparian functions such as LWD inputs, shading, and bank stability (USDA Forest Service, USDI Fish and Wildlife Service, INFISH, 1995). INFISH RHCA buffers are: 300 ft each side of fish-bearing streams, 150 ft each side of non fish-bearing perennial streams, and 50 feet each side of non fish-bearing intermittent streams. Springs would be protected with 100-foot buffers as required by the Forest Plan.

R6 BMPs, Forest Plan standards, and INFISH standards and guides would reduce effects from timber harvest and associated road reconstruction and use. These measures are designed to protect stream channels and banks, reduce soil disturbance and compaction, and reduce channelized sediment delivery to streams, which would result in minimal impacts to water quality and aquatic species.

Of the five commercial harvest alternatives, Alternatives Four, Seven, and Seven-A have the highest potential for causing negative effects to water quality and fish from vegetation management activities because they propose the highest combination of acres of commercial harvest, miles of temporary road construction, and miles of road activities related to timber harvest (i.e. truck traffic, road reconstruction, and road maintenance). Alternative Two would have a slightly lower potential for causing adverse effects based on fewer acres of timber harvest related activities. Alternative Five has the least potential for negative effects to water quality and aquatic habitat based on the fact that this alternative has the least amount of acres with timber harvest related activities. Alternatives 3 and 6 do not include timber harvest activities which would allow

the fuel levels to increase resulting in a greater chance of a stand replacement fire and negative effects to redband trout and the Malheur mottled sculpin.

Cumulative Effects

Past Effects

During the past 100 years timber harvesting, livestock grazing, noxious weeds, stream dewatering, fire suppression, road construction on erosive soils, road density, lack of road maintenance, and general road use on public and private lands have contributed to landscape changes in overland and stream flows affecting riparian and aquatic habitat. These changes are having negative affects on water quality, and aquatic species. Fire exclusion in the 20th century resulted in dense understories that may be detrimentally affecting late season flow in streams. Extensive road construction and timber harvest activities often occurred in stream channels resulting in unstable streambanks and high amounts of sediment. The cumulative affects of riparian grazing and timber harvest contributed to a reduction of LWD, wider stream channels, and loss of stream shade, resulting in higher stream temperatures and a reduction of high quality pools. Map 30 (stream reaches) Map 31 (Sediment from roads) Map 32 (Past Harvest Activities) Map 29 (temp), Map 33 (wood) and Map 34 (pools) in the map section at the end of Chapter 2 display site specific areas within the project area where these activities and subsequent habitat alteration occur. Table 9 describes past commercial harvest and fire activity by subwatershed (since1982) within the project area.

Table 9 Historical Commercial Harvest and Fire Activity within the Silvies Canyon Watershed

Subwatershed/ Watershed	Year/Acres Commercial Harvest	Years/Acres of prescribed Burn	Years/Acres of Wildfires (>5ac.)
Boulder Creek/Fawn Creek	1983-1996 / 1149	0	0
Burnt Mountain	1984-1981 / 610	1996-1999/5298	0
Myrtle Creek	1984-1995 / 1684	1996/16	0
Myrtle Park	1984-2003 / 6677	NA/52	0
Red Hill	1984-1993 / 642	1997/132	0
Sage Hen Creek	1983-2003 / 2508	1996-1999/698	0
Stancliffe Creek	1982-1994 / 1682	1995-1999/853	0
Silvies Canyon			118
Total Acres	1982-2003 / 14,952	1995-1999 / 7049	118

As streams became channelized riparian floodplains lost their ability to retain ground water and floodplain vegetation changed from grasses, sedges and forbs to sagebrush and rabbitbrush. During the past 20 years efforts have been made to limit resource degradation withinthe watershed by conducting small scale restoration projects. These projects included; meadow restoration, headcut stabilization, streambank stabilization, aspen restoration, livestock exclosures and drift fences. INFISH guidelines established riparian stream buffers and now exclude activities from these areas that may have negative affects on aquatic ecosystem. However, this process will require decades to restore natural drainage systems and meet INFISH/FOREST RMOs, including pool frequency, water temperature, large woody debris, bank stability, lower bank angle, and width depth ratios.

Cumulative Effects at the Silvies Canyon Project Level

Management activities and natural processes over space and time create cumulative watershed effects. These include but are not limited to: changes in timing and magnitude of flows, sediment supply to channels, sediment storage, structure in channels, and water temperature, snowmelt and freezing. Cumulative watershed effects can affect fish directly by increasing sedimentation of spawning/rearing habitat, or indirectly by changes in habitat, water quality, or impacts to macroinvertebrates/aquatic organisms.

Prescribed burning combined with juniper treatments, precommercial and commercial thinning, aspen restoration, road closures, reconstruction and decommissioning, spring restoration and noxious weed control would improve watershed conditions

and aquatic habitat. The result would be improved channel stability with the addition of LWD from aspen restoration sites, enhanced riparian areas and riparian vegetation through thinning of conifers in aspen stands and reduction in sediment erosion-prone roads. As individual roads are closed and decommissioned in the upper part of the watershed, sediment input would be reduced and eventually the entire watershed and downstream areas would receive less sediment, resulting in long term positive cumulative effects for water quality and aquatic species.

The cumulative effects of precommercial thinning, commercial thinning and prescribed burning would reduce the chance of stand replacement fires and the potential negative effects to soils and water quality (Beschta et al. 1987, McNabb and Swanson 1990, and Effects of Fire on Soil 1979). The higher number of acres thinned and prescribed burned, the greater the reduction in fuel levels across the landscape. This reduces fire danger and decreases the intensity of wildfires. Alternatives 4 and 7 would reduce fuel levels on the most acres, followed by alternatives 7a, 2, 5, 3, 6. In addition, alternatives 4 and 7 would reduce evapotranspiration on the most acres allowing more water for remaining vegetation, recharge of springs and stream flows, followed by alternatives 7a, 2, 5, 3, 6,

Based on the analysis of proposed activities, the action alternatives are not likely to exacerbate cumulative watershed effects; few adverse impacts from harvesting activities are expected due to design features, mitigation, and monitoring. Insignificant sediment increases are expected from soil disturbances, as RHCA buffers would filter any sediment from upslope activities.

Reasonable Foreseeable Activities

Potential effects from the action alternatives would be cumulative with effects from non-federal activities within the project area and all activities outside the project area on federal, state and private lands but within the Silvies River drainage. Aside from this project, other activities that may contribute to cumulative effects include; timber harvest activities, wildfires, livestock grazing, road use, flood irrigation, and vegetation alteration. These activities occur on an annual basis with the exception of timber harvest and wildfire and are known contributors of stream dewatering and sediment, affecting water quality and aquatic species to an unknown degree.

Water diversions for flood irrigation occur in Myrtle Creek just above the 31 road on USFS/private lands, and in the Silvies River in Silvies and Bear valleys, on private lands. In both cases small weir dams block the stream flow and divert it into the floodplain for livestock grazing or hay production. These diversions may restrict seasonal fish movement during the spring and summer and temporarily trap fish. Sediment is released downstream when the structures are opened at the end of the irrigation season, affecting fish habitat and reproductive success. These diversions also affect natural seasonal water flows.
Other large-scale timber harvest activities and wildfires within the sub-basin (35 river miles upstream of the Silvies project area) include the 8000 acre Flagtail wildfire in 2002. Between 3800 and 5000 acres would be harvested on National Forest System Lands in 2004, with no harvesting activities in RHCAs. Associated restoration projects occurring in 2003 include adding LWD to 27 miles of streams, riparian planting of hardwoods on 200 acres, coarse wood placement on 3-5 acres of sensitive soils, and decommissioning/closure of 24 miles of road. Additionally there are state permits for timber harvesting on 8540 acres of private land occurring 35 miles upstream of the Silvies Canyon watershed.

Both positive and negative effects from these activities are likely to be immeasurable at the Silvies Canyon project area due to distance between project areas, numerous beaver dams, and diversions for flood irrigation that filter out sediment over 35 miles of stream channel.

Livestock grazing and its effects on water quality (temperature and sediment) and aquatic species would continue into the foreseeable future until addressed in allotment management plans. Allotment management plans for Silvies, Big Sagehen, Crooked Creek, and Scotty allotments are scheduled for completion in 2005. The West Myrtle and Scatfield allotment management plans were completed in 1996. The Myrtle allotment management plan completed in 1996 addressed negative effects of livestock grazing on several reaches of the Silvies River and Myrtle Creek systems that are in a current downward trend due to excessive riparian forage utilization and associated bank failures. Currently more than half of the reaches within the Silvies Canyon watershed are classified as functioning-at-risk (see Silvies Canyon WA 2000) and contribute to higher stream temperatures and sediment, due to lack of shade and bank failure, respectively. Shading of streams has been documented as a key component in

maintaining proper stream temperatures (Beschta et al., 2003).

This cumulative component and future recovery of riparian areas depends on the level of livestock use and achievement of grazing standards within the RHCAs. The outcome would influence and may offset some of the positive benefits for water quality and aquatic species gained from this project. This analysis will assume that Forest Service grazing standards would be achieved in the future. Under these conditions riparian vegetation would stabilize stream banks in about 3-5 years, and produce stream shade in 10-20 years. Narrowing of stream channels requires the longest recovery period, between 10 to 50 years, but due to the high number of stream reaches currently functioning at risk, the stream channel recovery period could be longer.

Summary of Effects

Of the action alternatives, Alternatives Four and then Seven, allow for the most improvement within the project area with the least potential for negative impacts to soils and water quality. Alternative Four treats (closures, decommissions and reconstruction) about 345 roads and 164 miles while alternative Seven treats about 248 roads and 93 miles. These alternatives would prevent further decline in watershed health, reduce risks affecting ecosystem sustainability, begin vegetation and watershed restoration activities, lower the risk of stand-replacement fires, protect and improve riparian, aquatic and terrestrial habitat, and address road management concerns. Environmental changes resulting from these actions include the enhancement of riparian areas and improved watershed health and ecosystem sustainability that would be consistent with the Clean Water Act, INFISH and Forest standards. Minimal watershed and aquatic impacts from harvesting activities are likely to occur due to the implementation of design features, BMPs, INFISH RHCA buffers and monitoring strategies associated with these action alternatives. Negligible direct, indirect, and cumulative effects on water quality (sediment and temperature) and quantity (magnitude, timing, and duration) are anticipated if these alternatives are implemented. Erosion control structures and stream buffers would limit sediment input into streams. Canopy reductions would allow more snow accumulation and less evapotranspiration, which would allow more water to be available for stream flows. A reduction in stream sediment would improve aquatic habitat, especially pool quality, and allow redband trout and other aquatic species to increase in size. Activities associated with the action alternatives would maintain or improve water quality (temperature and sediment) in the long term on Myrtle Creek, a 303D listed stream for temperature and on other streams with documented high water temperatures.

Considering the use of INFISH RHCA stream buffers and the level of beneficial activities that would affect redband trout, the Malheur mottled sculpin and their associated habitat, the proposed activities from the action alternatives activities **May Impact Individuals or their Habitat but would Not Likely Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species (MIIH)** in the short term (1-3 years). After the completion of road treatments aspen restoration and prescribed burning, there would be long term **Beneficial Impacts (BI)** to both species and their habitats, as sediment input decreases, stream shade increases and the risk of stand replacement fire decreases.

Sensitive Plants

Sensitive plants suspected to occur on the district are derived from the 1999 Region 6 Sensitive Plant List. The affected environment is identified by reviewing historical records of Region 6 sensitive plant occurrences in the planning area, and by surveying areas of potential habitat for new populations of sensitive plants. Habitats suspected of harboring new populations are identified based on aspect, elevation, and ecoclasses (plant association). Brooks et al. (1991) describes specific habitat features for Malheur National Forest sensitive species. Species known or suspected to occur in the planning area are listed in Table 10.

Table 10. Sensitive plant species suspected to occur within the Silvies Canyon Watershed Planning Area.

Species Name	Common Name
Astragalus tegetarioides	Deschutes milkvetch
Botrychium spp.	moonworts
Carex interior	Inland sedge
Carex parryana	Parry's sedge
Achnatherum hendersonii and A. wallowensis	Henderson's ricegrass
Lomatium ravenii	Raven's lomatium

Sensitive plant surveys were conducted in the

planning area in 1994, 1996, 1999, 2000 and 2002. Habitats suspected to harbor the plants listed in Table 10 were examined by means of a floristic walk-through survey (Nelson 1985) during specific times of the year for peak plant identification periods.

One new population of crenulate moonwort was found in 2000. The documented sensitive plant sites from previous surveys include one population of Raven's lomatium and eighteen populations of Deschutes milkvetch within the planning area.

Mitigation For All Action Alternatives

A 50-foot ATP (area to protect) would be established around the outer extent of all documented/mapped sensitive plant sites. Vehicles, equipment, and operations that would displace soils or damage plants, would not be permitted in the ATP. All trees would be directionally felled away from the ATP. Activity created slash would not be piled in ATPs. Seeding of decommissioned road segments within documented ATP sites would not occur. Before any road reconstruction occurs, the reconstruction plan would be review by the botanist to ensure that sensitive plant populations are not inadvertently impacted or impacts are minimized. During prescribed burning, fire line construction and fire suppression equipment use would not occur within documented ATP sites. Any exceptions would have to be evaluated for compatibility by a botanist prior to implementation.

Crenulate moonwort

(Botrychium crenulatum) Wagner

Status

Federal Status: Species of Concern
Forest Service (Region 6) Status: Sensitive (USFS 1999)
Oregon State Status: Candidate for listing by Oregon Dept. of Agriculture under the Oregon Endangered Species Act of 1987
Oregon Natural Heritage Program Status: List 1 (ORNHP 2000)

Conservation Status Ranking

(ORNHP 2000)

Global Rank=G3
Oregon State Rank=S2

Major Threats

Alteration of the area water regime is a threat. Trampling by domestic livestock and public use could pose a threat.

Degree of Fragility

Very fragile

Habitat

Crenulate moonworts (hereafter referred to as BOCR) are found in wet seep or spring areas in lodgepole or mixed conifer forest habitat, in moist meadows with varying amounts of graminoids and forbs. It can sometimes be found in full sun and sometimes at the edge or under the shade of tree seedlings and in boggy, stream or riverbanks. Moonworts are relatives of ferns and produce spores for sexual reproduction. Moonwort spores require a medium of soil or humus in which to germinate, which implies some ground disturbance (Wagner & Wagner 1993). Zika (1992) noted that the nature of disturbance was important in providing a medium suitable for moonwort recruitment-modest flooding along headwater creek floodplains, frost heaving, and soil creep. The author found many moonworts colonizing small patches of ground less than 10 cm square, so small mammal mounds (gophers and other small, burrowing animals) may create colonization sites. Moonworts have been observed colonizing areas such as these, but also have been observed on more severely disturbed soil in riparian areas and floodplains. These disturbances appear to be solitary events occurring about twenty or more years ago; hence, larger disturbances permitting moonwort colonization have probably not been ongoing or otherwise chronic.

Intermittent wetness, characteristic of its habitats, provides moisture for the survival and growth of the fungus that provides the critical mycorrhizal connection to the moonworts. These intermittent wet habitats also presumably prevent competition from species better adapted to perennially dryer or wetter conditions. Sites should be protected from severe disturbances that eliminate shade or alter the water regime such as forest canopy thinning and water diversion for livestock.

Moonworts have an essential symbiotic relationship

with fungi, in which the fungus receives secondary compounds and the moonworts receive food, water and nutrients. Moonworts cannot survive without this fungal relationship, and it is believed that they may not need to photosynthesize because of the sustenance they receive from the fungus (Farrar and Johnson 1997). For this reason, they grow underground for years, producing many leaves before they ever emerge above ground. When they do emerge, they often are found on old, down trees that are overgrown with mosses and liverworts or on convex humps or toe slopes that afford the moonwort ground with less competition, above the more thickly vegetated, seepy substrate.

Moonwort species are usually less than 10 centimeters tall, display only two leaves each season, and turn yellow in late summer-autumn. It is most commonly found growing with strawberry plants (*Fragaria* spp.). No other plant associates have been identified.

Distribution

Various moonwort species are found throughout North America yet appear to be very rare on the Malheur National Forest and even more rare on the Burns Ranger District. There are only three documented sites on the district.

This plant usually occurs above 4,500 feet elevation on the Malheur National Forest, but in a variety of habitats. The distribution of individual species of moonworts, including BOCR, is unknown because data on these rare plants has been collected only recently and their full range has not been determined.

Existing Conditions

One population of BOCR has been found in the planning area, in the Myrtle Park subwatershed (T.18 S., R. 30 E., Sec. 19). It was found in two locations along a moist meadow, one location with nine plants, the other with two plants.

Effects and Determination

Alternative 1–No Action

Under this alternative, there would be no management activities; therefore, there would be **No Impact (NI)** to this BOCR population.

Ongoing activities (grazing, fire management, road use) would continue to influence conditions at this site. The effects of these activities on this species are not fully understood at this time.

Common to All Action Alternatives

Noxious Weeds

Manual treatment of noxious weed sites would not impact the BOCR population because there are no noxious weed sites within the BOCR site.

Fuels Management

No fuels management activities for the area containing the BOCR site are proposed under any alternative; therefore, no impact would occur. This site is a wet or moist meadow and even in the driest year would not burn during prescribed burning periods (spring and fall).

Riparian Habitat (Spring) Restoration

Proposed riparian (spring) restoration of Gribble spring includes fencing the entire wet/moist meadow of approximately 7 acres. The proposed fence would have no direct effect to Botrychium crenulatum because the fence line would not be constructed where the plants are growing. Indirect effects would be beneficial because detrimental disturbance by livestock grazing to moonworts would not occur. If the viability of Botrychium crenulatum is determined to depend on the level or timing of grazing, fencing the entire wet meadow allows for regulating this type of disturbance. Monitoring the BOCR populations will help determine how the site should be managed in the future.

Alternative 2 - Proposed Action

Vegetation Management

Direct and Indirect Effects

The mixed conifer stands surrounding the BOCR site would be treated with an intermediate thinning (Stands 30.02 and 30.03). The BOCR site is located within the 150-foot RHCA buffer (class 3 stream). With application of RHCA restrictions there would be no direct effect on population of BOCR as a result of upland treatment.

The indirect effects of intermediate thinning could include changes in relative humidity and tree canopy of the surrounding mixed conifer forest, in hydrologic relationships and in soil structure. These changes

could alter the habitat conditions for BOCR plants, leading to insufficient moisture levels due to decreased shading and/or greater competition by other plant species due to increased light availability.

Road Closure

Direct and indirect effects

There would be no direct effects to BOCR populations under Alternative 2- Proposed Action, which permanently closes Forest Service road 3700379. While this treatment does not return the road prism to natural conditions, it could reduce its potential as a sediment source by restricting use, thereby indirectly improving BOCR habitat.

Cumulative effects

Past domestic grazing, timber harvesting and fire suppression have contributed to great changes in riparian habitats and the plant communities they support. The distribution and vitality of BOCR and all other moonwort species before these management activities began are unknown. Disturbance by livestock grazing could be detrimental to moonworts or could provide for their viability depending on the level or timing of grazing. Trampling and grazing could create soil openings in which moonwort spores (the reproductive cells essential to the reproductive cycle of moonworts to produce new plants) may germinate. However, excessive, late-season grazing, which leads to heavy trampling in riparian areas and grazing of the very short (less than 6 inches) moonwort, would be deleterious to mature plants.

Historic grazing levels have resulted in loss of potential moonwort habitat through stream downcutting and accelerated erosion processes that significantly alter local surface hydrology. Past timber harvesting has also increased erosion and altered hydrologic relationships. Historic logging practices included skidding logs through riparian areas which could have destroyed existing plants but could have also provided soil openings for new plants to establish.

Fire suppression may have caused a decline in moonwort populations through increased competition for soil moisture and nutrients by shade-tolerant plant species. In addition, the repression of the natural fire regime likely reduced the amount of disturbance in riparian areas where new moonworts could have established.

Proposed activities of fencing the entire wet/moist meadow and closing or decommissioning forest road 3700379 would be beneficial to moonworts. In the future, this fence could regulate the level or timing of grazing, or eliminate grazing altogether within the entire wet/moist meadow. Cumulatively, these actions would have a beneficial effect on moonworts.

Cumulatively, these factors have resulted in habitat alteration through stream downcutting, hydrologic changes, soil compaction, changes in tree canopy density, intense competition from exotic and native plant species, and direct crushing/uprooting of plants.

Determination

Through compliance with RHCA regulations, there would be **No Impact (NI)** under Alternative 2– Proposed Action.

Alternative 3

Vegetation Management

Direct and Indirect Effects

Precommercial thinning is proposed for the mixed conifer forest surrounding the BOCR site. The site is located within an RHCA buffer therefore piling of slash would not occur. Through avoidance, there would be no direct impacts to this site.

Indirectly, reducing the canopy cover through precommercial thinning would decrease shade and could change the relative humidity and hydrology of the mixed conifer stand that provides the cool, moist habitat where BOCR grows.

Road Decommission

Direct and Indirect effects

There would be no direct effects to BOCR populations because of decommissioning Forest Service road 3700379. Decommissioning the road may require erosion control through direct seeding of the roadbed. Preferably, local, native grasses would be seeded; however, the source for these grasses has not yet been fully developed. To reduce the risk of creating competitive stress on BOCR, only annual, non-persistent grasses should be used because they pose less threat of long-term competitive stress.

Indirect effects of decommissioning this road would be reduced damage to the riparian area supporting the BOCR habitat because motorized access to this area would be eliminated.

Cumulative effects

Cumulative effects are the same as for Alternative 2–Proposed Action.

Determination

Through compliance with RHCA regulation and the recommended mitigation, there would be **No Impact (NI)** under Alternative 3.

Alternative 4

Vegetation Management

Direct and Indirect Effects

Under Alternative 4, the mixed conifer stand surrounding the BOCR site would be managed by an intermediate thinning treatment, the same activity and effects as discussed under Alternative 2-Proposed Action.

Road Decommission

Direct and Indirect Effects

Under Alternative 4, road 3700379 would be decommissioned. This is the same activity and effect as discussed under Alternative 3.

Cumulative effects

Cumulative effects are the same those discussed under Alternative 2–Proposed Action.

Determination

Through compliance with RHCA regulation and the recommended mitigation, there would be **No Impact (NI)** under Alternative 4.

Alternative 5

Vegetation Management

Direct and Indirect Effects

Under Alternative 5, the mixed conifer stand surrounding the BOCR site would be managed by an intermediate thinning treatment, the same activity and effects as discussed under Alternative 2-Proposed Action.

Road Closures

Direct and Indirect Effects

There would be no effects to the BOCR population under Alternative 5 because Forest Service road 3700379 would be left open.

Cumulative effects

Cumulative effects are the same those discussed under Alternative 2–Proposed Action.

Determination

Through compliance with RHCA regulation and the recommended mitigation, there would be **No Impact (NI)** under Alternative 5.

Alternative 6

Vegetation Management

Direct and Indirect Effects

Under Alternative 6, precommercial thinning is proposed for the mixed conifer forest surrounding the BOCR site, which is the same activity proposed under Alternative 3. Refer to effects for vegetation management under Alternative 3.

Cumulative effects

Cumulative effects are the same those discussed under Alternative 2–Proposed Action.

Determination

Through compliance with RHCA regulation and the recommended mitigation, there would be NO IMPACT (NI) under Alternative 6.

Alternative 7 – Preferred Alternative

Vegetation Management

Direct and Indirect Effects

Under Alternative 7, the mixed conifer stand surrounding the BOCR site would be managed by an intermediate thinning treatment, the same activity and effects as discussed under Alternative 2-Proposed Action.

Road Decommission

Direct and Indirect Effects

Under Alternative 7, road 3700379 would be closed. This is the same activity and effect as discussed under Alternative 2-Proposed Action.

Cumulative effects

Cumulative effects are the same those discussed under Alternative 2–Proposed Action.

Determination

Through compliance with RHCA regulation and the recommended mitigation, there would be **No Impact (NI)** under Alternative 7.

Alternative 7a

Vegetation Management

Direct and Indirect Effects

Under Alternative 7a, the mixed conifer stand surrounding the BOCR site would be managed by an intermediate thinning treatment, the same activity and effects as discussed under Alternative 2-Proposed Action.

Road Decommission

Direct and Indirect Effects

Under Alternative 7a, road 3700379 would be closed. This is the same activity and effect as discussed under Alternative 2-Proposed Action.

Cumulative effects

Cumulative effects are the same those discussed under Alternative 2–Proposed Action.

Determination

Through compliance with RHCA regulation and the recommended mitigation, there would be **No Impact (NI)** under Alternative 7a.

Deschutes milkvetch

(Astragalus tegetarioides) Jones

Status

Federal Status: Species of Concern
Forest Service (Region 6) Status: Sensitive (USFS 1999)
Oregon State Status: Candidate for listing by Oregon Dept. of Agriculture under the Oregon Endangered Species Act of 1987
Oregon Natural Heritage Program Status: List 1 (ORNHP 2000)

Conservation Status Ranking

(ORNHP 2000)

Global Rank=G3
Oregon State Rank=S3

Major Threats

This species in not very threatened range-wide. It is self-protecting by unsuitability of habitat for other uses. Forest management practices, which discouraged natural wildfires, may be suppressing this taxon (TNC 1999). Suppression of wildfires has reduced the number of open, disturbed sites on which this species depends.

Degree of Fragility

Fairly resistant (NatureServe 2000).

Habitat

Deschutes milkvetch (hereafter referred to as ASTE) occurs in open stands of big sagebrush, or low sagebrush (*Artemisia arbuscula*), and in openings, swales and canyon bottoms in ponderosa pine forests. It is found on soils that are shallow to moderately deep and varying in texture from clay-loams to gravelly or somewhat rocky. It has not been found in stands of sagebrush or ponderosa pine where canopy closure is greater the 75 percent, or where needle duff is greater then one inch deep. The majority of the plants found occur in the following:

Swales dominated by big or low sagebrush, often with adjacent higher ground supporting ponderosa

pine.
Minor tributary draws which experience seasonal water flows, again associated with big sagebrush.
in openings within forest stands where the soil seems thin or rocky
dirt roads, where plants are found in the road margins or between wheel tracks

Other common associates of ASTE include western juniper (*Juniperus occidentalis*), bitterbrush, green rabbit-brush (*Chrysothamnus viscidiflorus*), Idaho fescue (*Festuca idahoensis*), Sandberg's bluegrass (*Poa sandbergii*), Ross's sedge (*Carex rossii*), *Eriogonum umbellatum, E. ovalifolium, Lupinus lepidus, Epilobium paniculatum, Phacelia hastata, Eriophyllum lanatum*, and *Antennaria microphylla*.

Flowering occurs in late June to early August, and occasionally into October.

Distribution

This plant is known only from northern California (Ash Valley, Lassen County) and central and eastern Oregon at moderate elevations of 4,800 to 5,300 feet (Brooks et al. 1991). Plants have been found near Juniper Mountain on Lakeview District, BLM, on the Snow Mountain Ranger District, Ochoco National Forest, and on the Burns Ranger District, Malheur National Forest. The full range of this plant has not yet been determined.

Existing Conditions

Eighteen populations of ASTE have been found in the proposed planning area. Fifteen populations exist in the Stancliffe Creek subwatershed (T. 19 S., R. 31 E., Sec. 33, 34, & 35 and T. 20 S., R. 31 E., Sec. 3, 5, 9, 15 & 16) and three populations are in the adjacent subwatershed of Burnt Mountain (T. 20 S., R. 31 E., Sec. 7 and T. 20 S., R. 30 E., Sec. 3 & 14). The population sizes range from four individual plants to more than 500 plants. The heaviest concentration of plants is found in the open stands of big sagebrush, with fewer plants in the open ponderosa pine stands.

Effects and Determination

Alternative 1–No Action

Under this alternative, there would be no management activities; therefore, there would be **No Impact (NI)** to local ASTE populations.

Common to All Action Alternatives

Noxious Weeds

Manual treatment of noxious weeds from ASTE sites is expected to beneficially impact identified populations. This is a result of reducing competition for growing space and resources (Malheur National Forest Noxious Weed Control EA).

Alternative 2- Proposed Action

Vegetation Management

Direct and Indirect Effects

There would be direct and indirect effects to the populations of ASTE from silvicultural activities proposed under this alternative. Various proposed activities would potentially affect 15 of the 18 ASTE populations found in the watershed (Table 11.).

Skidding trees through documented ASTE sites could uproot or crush individual or groups of plants. Piling slash or stems may smother plants. Mechanical piling could be particularly severe on this small plant. It could be easily uprooted, and it could be crushed by machinery as well as buried by displaced soil.

Indirectly, ASTE can be positively influenced by soil disturbance, removal of heavy pine litter and created openings in the canopy. These activities could increase light penetration to the ground, decrease pine needle litter and duff, and provide scarified soil that likely improve site conditions for ASTE establishment or expansion.

Table 11. ASTE sites that may be impacted by vegetation management activities proposed under the Alternative 2-Modified Proposed Action.

ASTE site number	PCT	CT	JR
020003		X	
020005	X	X	X
020008		X	
020009		X	
020010	X		
020013		X	
020014		X	
020015	X		X
020024		X	
020025	X		
020026		X	
020029		X	
020030	X	X	
020031	X	X	
020032	X		

PCT – Precommercial thinning
CT – Commercial thinning
JR – Juniper reduction

Fuels Management

Prescribed burning activities in proposed burn blocks could potentially affect known ASTE populations found in the watershed (Table 12.). During prescribed burning, active lighting would be concentrated in forested areas, although fire would be allowed to creep into nonforested areas. Prescribed fire is not expected to burn intensively or extensively in nonforested areas. ASTE is presumably adapted to a fire regime of frequent, low intensity fires in mid to late summer, and it is assumed it is also adaptable to early spring burning.

Table 12. ASTE Sites That May be Impacted by Prescribed Burning.

ASTE site number	Fuel Block						
	5	6	7	7b	8	9	9a
020003			X				
020005			X			X	
020008			X				
020009			X				
020010					X	X	X
020011							
102002						X	
020013							X
020014			X				
102005						X	
202004						X	
020025						X	
020026			X				
020029	X						
020030			X	X			
020031		X	X				
020032						X	
020033					X		

ASTE are not generally found where needle duff is greater than one inch deep. This indicates that the plants would naturally occur in openings with low fuel loading. Prescribed fire burning in typical ASTE habitat would likely pass by without burning much of the groundcover in these sites.

Road Closures

Direct and Indirect Effects

There would be direct and indirect effects to four ASTE sites because of road closures.

Population 020013 may be affected by closure of roads 3130057, 3130074, and 3130077.

Population 020030 may be affected by closure of road 3120161.

Population 020032 may be affected by closure of road 3130616.

Population 020033 may be affected by closure of road 3130988.

Direct effects of uprooting, crushing or smothering plants would result from road closures (earth berm) if ASTE occur at or near the closure site. An earth

berm could obliterate an entire ASTE population if the population consists of only a few plants.

The use of pole gates, steel gates or closure signs would be less impactive on populations because individual plants could be avoided in the small area needed to install the gate or sign. These structures would be substituted for earth berms if impacting large clusters of ASTE were unavoidable.

Direct effects of road decommissioning would destroy plants that grow on the road shoulders or in the center of the wheel tracks, where they are commonly found. Road surface scarification should be avoided where possible conflicts with ASTE occur.

Waterbars would cause minor disturbance to the existing plants because of the small area they employ. Slash piling as sediment barriers at waterbar outlets could smother plants and destroy habitat for this plant, which needs bare ground to establish and flourish.

By limiting the motorized vehicle traffic, the road closures would have indirect effects on ASTE. The populations may increase their concentration in the roads by colonizing abandoned wheel tracks. This colonization could help stabilize the road against surface erosion.

Cumulative effects

The ecological niche of this plant is not fully understood. This species behaves as an early seral species of the pine forest, appearing in openings made by fire or other disturbances. Field observations from this forest and the Ochoco National Forest indicate that the species can tolerate some disturbance from fuels treatment, grazing, timber harvest activities, and road construction.

Plants have been found growing in low use dirt roads, in gravel fill on road shoulders, and in sagebrush flats treated with a low intensity fuel reduction/range improvement burn (unnumbered population growing in Crow Flat, burned in the spring of 1994). Past road closures have also encouraged the spread of this species in the roadbed, thus stabilizing the road soil from probable erosion. The cumulative effects are not expected to be harmful and may even have a beneficial impact.

The ecological factor(s) responsible for the limiting the distribution of this plant have not yet been identified. Rarity in other members of this genus have been variously attributed to habitat alteration, herbicides, inbreeding depression, pre-dispersal seed predation, competition for pollinators, and destruction of pollinator habitat by livestock (USFS, Biological Evaluation for Sensitive Plants in the Silver Creek Analysis Area, 1991). Observations on the Malheur National Forest indicate that this plant does not respond well in disturbed areas that have been seeded with non-native grasses or in areas that experience sheet erosion.

Determination

Due to the potential for impacts, this alternative may impact individuals and their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population of this species (MIIH).

Potential impacts are minor and would be avoided altogether with implementation of recommended mitigation measures. This would result in a determination of **No Impact** to ASTE.

Alternative 3

Vegetation Management

Direct and Indirect Effects

There may be indirect effects to the populations of ASTE from silvicultural activities proposed under this alternative. Various proposed activities would potentially affect 14 of the 18 ASTE populations found in the watershed (Table 13).

Precommercial thinning and juniper reduction should create openings in the canopy. This would increase light penetration to the ground, decrease future build up pine needle litter and duff, and this in combination with prescribed burning provide a limited amount of scarified soil that likely improve site growing conditions to promote ASTE establishment or expansion.

Table 13. ASTE sites that may be impacted by vegetation management activities proposed under Alternative 3.

ASTE site number	PCT	JR
020003	X	
020005	X	X
020009	X	
020010	X	
020011	X	
020014	X	
020015	X	X
020024	X	
020025	X	
020026	X	
020029	X	X
020030	X	
020031	X	
020032	X	

PCT – Precommercial thinning
JR – Juniper reduction

Road Closures

There could be direct and indirect effects to four ASTE sites because of road closures.

Population 020013 may be affected by closure of roads 3130057, 3130074, and 3130077.

Population 020026 may be affected by decommissioning of road 3130095.

Population 020032 may be affected by closure of road 3130616.

Potential effects of road closure and decommissioning would be similar to that discussed under Alternative 2- Proposed Action.

Fuels Management

The direct and indirect effects of fuels treatment on ASTE under this alternative are the same as the, Alternative 2- Proposed Action.

Cumulative effects

Cumulative effects of this alternative are the same as for Alternative 2–Proposed Action.

Determination

Due to the potential for impacts, this alternative may impact individuals and their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population of this species (MIIH).

Potential impacts are minor and would be avoided altogether with implementation of recommended mitigation measures. This would result in a determination of **No Impact** to ASTE.

Alternative 4

Vegetation Management

Direct and Indirect Effects

There would be direct and indirect effects to the populations of ASTE from silvicultural activities proposed under this alternative. Various proposed activities would potentially affect 16 of the 18 ASTE populations found in the watershed (Table 14).

Table 14. ASTE sites that may be impacted by vegetation management activities proposed under Alternative 4.

ASTE site number	CT	IT	PCT	JR
020003	X			
020005			X	X
020008	X			
020009	X			
020010		X		
020011	X			
020013	X			
020014	X			X
020015	X		X	X
020024	X			
020025	X			
020026	X			
020029	X			
020030			X	X
020031	X		X	
020032	X			

CT=Commercial thin IT=Intermediate thin
PCT – Precommercial thinning JR – Juniper reduction

The effects of this alternative would be similar to that discussed under Alternative 2- Proposed Action.

Fuels Management

The direct and indirect effects of fuels treatment on ASTE under this alternative are the same as the Alternative 2- Proposed Action.

Road Closures

There could be direct and indirect effects to four ASTE sites because of road closures.

Population 020005 would be affected directly by the decommissioning of road 3100759.

Population 020013 may be affected by closure of road 3130077.

Population 020026 would be directly affected by the decommissioning of road 3100095.

Population 020032 may be affected by closure of road 3130616.

Refer to Alternative 2-Proposed Action for direct and indirect effects of road closures and road decommissioning on ASTE.

Cumulative effects

Cumulative effects of this alternative are the same as for Alternative 2–Proposed Action.

Determination

Due to the potential for impacts, this alternative may impact individuals and their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population of this species (MIIH).

Potential impacts are minor and would be avoided altogether with implementation of recommended mitigation measures. This would result in a determination of **No Impact** to ASTE.

Alternative 5

Vegetation Management

Direct and Indirect Effects

There would be direct and indirect effects to the populations of ASTE from activities proposed under this alternative. Various proposed activities would potentially affect 15 of the 18 ASTE populations found in the watershed (Table 15).

The effects of these activities are the same as those discusses under Alternative 2- Proposed Action.

Table 15. ASTE sites that may be impacted by vegetation management activities proposed under Alternative 5.

ASTE site number	CT	PCT	JR
020003	X	X	X
020005	X	X	X
020008		X	
020009		X	
020010	X		
020013	X		
020014		X	
020015	X	X	X
020024		X	
020025	X		
020026		X	
020029		X	
020030	X	X	
020031	X	X	
020032	X		

CT=Commercial thin
PCT – Precommercial thinning
JR – Juniper reduction

Road Closures

Road closures would not occur in documented ASTE sites; therefore, there would be no impacts.

Fuels Management

The effects of fuels treatment on ASTE under this alternative are the same as the Modified Proposed Action; however, fuel block 8 has been omitted under this alternative.

Prescribed burning activities in proposed burn blocks would potentially affect 15 of the 18 known ASTE populations found in the watershed (Table 10.). ASTE population 020010 and 020033 fall within the omitted fuel block 8

Cumulative effects

Cumulative effects are the same as for Alternative 2–Proposed Action.

Determination

Due to the potential for impacts, this alternative may impact individuals and their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population of this species (MIIH).

Potential impacts are minor and would be avoided altogether with implementation of recommended mitigation measures. This would result in a determination of **No Impact** to ASTE.

Alternative 6

Vegetation Management

Direct and Indirect Effects

The effects of vegetation treatment on ASTE under this alternative are the same as that discussed under Alternative 3.

Fuels Management

Direct and Indirect Effects

Prescribed burning activities in proposed burn blocks would potentially affect 17 of the 18 known ASTE populations found in the watershed (Table 16.).

Table 16. ASTE sites that may be impacted by prescribed burning activities.

ASTE site number	Fuel Block 5	6	7	8	9	13
020003			X			
020005			X		X	
020008		X	X			
020009			X			
020010				X	X	
020011						X
020012					X	
020014			X			
020015					X	
020024					X	
020025					X	
020026			X			
020029	X					
020030			X			
020031		X	X			
020032					X	
020033				X		X

ASTE is presumably adapted to a fire regime characterized by frequent, low intensity fires in mid to late summer. The effects of spring and/or late fall burning are not understood but such a fire probably would have occurred naturally, but at a much lower frequency than summer/fall burns.

The effects of fuels treatment on ASTE under this alternative are the same as that discussed under Alternative 2- Proposed Action.

Road Closures

Direct and Indirect Effects

There could be direct and indirect effects to four ASTE sites because of road closures.

Population 020013 may be affected by closure of roads 3130074 and 3130077.

Population 020026 may be affected by closure of road 3130095.

Population 020032 may be affected by closure of road 3130616.

Population 020010 and 020033 may be affected by reconstruction of road 3130129.

Potential effects of road closure would be similar to that discussed under Alternative 2- Proposed Action.

Under this alternative, road reconstruction may impact two documented populations of ASTE located on and adjacent to Forest Service road 3130129. Reconstruction activities are focused on repairing parts of the road affecting stream quality and/or causing resource damage. ASTE does not occur near wet habitats and most likely would not occur where major reconstruction would occur, thereby avoiding impacting ASTE.

Recommended Mitigation

Before any reconstruction occurs, the botanist would review the reconstruction plan to ensure these populations are not inadvertently impacted or impacts are minimized.

Cumulative effects

Cumulative effects are the same as for Alternative 2–Proposed Action.

Determination

Due to the potential for impacts this alternative may impact individuals and their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population of this species (MIIH)

Potential impacts are minor and would be avoided altogether with implementation of recommended mitigation measures.

Alternative 7-Preferred Alternative

Vegetation Management

Direct and Indirect Effects

There would be direct and indirect effects to the populations of ASTE from silvicultural activities proposed under this alternative. Various proposed activities would potentially affect 16 of the 18 ASTE populations found in the watershed (Table 17.).

Table 17. ASTE sites that may be impacted by vegetation management activities proposed under Alternative 7.

ASTE site number	CT	IT	PCT	JR
020003	X			
020005			X	X
020008	X			
020009	X			
020010		X		
020011	X			
020013	X			
020014	X			X
020015	X		X	X
020024	X			
020025	X			
020026	X			
020029	X			
020030			X	X
020031	X		X	
020032	X			

CT=Commercial thin
IT=Intermediate thin
PCT – Precommercial thinning
JR – Juniper reduction

The effects of this alternative would be similar to that discussed under Alternative 2- Proposed Action.

Fuels Management

The direct and indirect effects of fuels treatment on ASTE under this alternative are the same as the Alternative 2- Proposed Action.

Road Closures

There could be direct and indirect effects to four ASTE sites because of road closures.

Population 020013 may be affected by closure of roads 3130074 and 3130077.

Population 020026 may be affected by closure of road 3130095.

Population 020032 may be affected by closure of road 3130616.

Population 020010 and 020033 may be affected by reconstruction of road 3130129.

Potential effects of road closure would be similar to that discussed under Alternative 2- Proposed Action.

Under this alternative, road reconstruction may impact two documented populations of ASTE located on and adjacent to Forest Service road 3130129. Reconstruction activities are focused on repairing parts of the road affecting stream quality and/or causing resource damage. ASTE does not occur near wet habitats and most likely would not occur where major reconstruction would occur, thereby avoiding impacting ASTE.

Recommended Mitigation

Before any reconstruction occurs, the botanist would review the reconstruction plan to ensure these populations are not inadvertently impacted or impacts are minimized.

Cumulative effects

Cumulative effects are the same as for Alternative 2–Proposed Action.

Determination

Due to the potential for impacts, this alternative may impact individuals and their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population of this species (MIIH).

Potential impacts are minor and would be avoided altogether with implementation of recommended mitigation measures. This would result in a determination of **No Impact** to ASTE.

Alternative 7a

Vegetation Management

Direct and Indirect Effects

There would be direct and indirect effects to the populations of ASTE from silvicultural activities proposed under this alternative. Various proposed activities would potentially affect 16 of the 18 ASTE populations found in the watershed (Table 18).

Table 18. ASTE sites that may be impacted by vegetation management activities proposed under Alternative 7a.

ASTE site number	CT	IT	PCT	JR
020003	**X**			
020005			**X**	**X**
020008	**X**			
020009	**X**			
020010		**X**		
020011	**X**			
020013	**X**			
020014	**X**			**X**
020015	**X**		**X**	**X**
020024	**X**			
020025	**X**			
020026	**X**			
020029	**X**			
020030			**X**	**X**
020031	**X**		**X**	
020032	**X**			

CT=Commercial thin
IT=Intermediate thin
PCT – Precommercial thinning
JR – Juniper reduction

The effects of this alternative would be similar to that discussed under Alternative 2- Proposed Action.

Fuels Management

The direct and indirect effects of fuels treatment on ASTE under this alternative are the same as the Alternative 2- Proposed Action except Fuel Block 6 has been omitted from this alternative.

Road Closures

There could be direct and indirect effects to four ASTE sites because of road closures.

Population 020013 may be affected by closure of roads 3130074 and 3130077.

Population 020026 may be affected by closure of road 3130095.

Population 020032 may be affected by closure of road 3130616.

Population 020010 and 020033 may be affected by reconstruction of road 3130129.

Potential effects of road closure would be similar to that discussed under Alternative 2- Proposed Action.

Under this alternative, road reconstruction may impact two documented populations of ASTE located on and adjacent to Forest Service road 3130129. Reconstruction activities are focused on repairing parts of the road affecting stream quality and/or causing resource damage. ASTE does not occur near wet habitats and most likely would not occur where major reconstruction would occur, thereby avoiding impacting ASTE.

Recommended Mitigation

Before any reconstruction occurs, the botanist would review the reconstruction plan to ensure these populations are not inadvertently impacted or impacts are minimized.

Cumulative effects

Cumulative effects are the same as for Alternative 2–Proposed Action.

Determination

Due to the potential for impacts, this alternative may impact individuals and their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population of this species (MIIH).

Potential impacts are minor and would be avoided altogether with implementation of recommended mitigation measures. This would result in a determination of **No Impact** to ASTE.

Raven's lomatium
(*Lomatium ravenii*) Mathias and Constance

Status

Federal Status: N/A
Forest Service (Region 6) Status: Sensitive (USFS 1999)
Oregon State Status: N/A
Oregon Natural Heritage Program Status: List 2 (ORNHP 2000)

Conservation Status Ranking
(The Association for Biodiversity Information 2000)

Global Rank=G4
National Rank=N4 (Dec. 17, 1994)
Oregon State Rank=S1

Major Threats

Not specified at this time

Degree of Fragility

Unknown

Habitat

Raven's lomatium (hereafter referred to as LORA) is found growing on lithosols in scab openings in mixed or ponderosa pine forest. It grows on flats, slopes, or ridges in association with low sagebrush, stiff sagebrush (*Artemisia rigida*) and western juniper. There is little information about this plant's mode of reproduction. It is presumed that the species depends upon individuals surviving disturbance events and then bearing seed to be scattered and restore the population.

Distribution

LORA is a rare plant once found in the Basin and Range of southeast Oregon. Herbarium records reveal a few early collections from Steens Mountain in Harney County, however repeated attempts to relocate these populations in the early 1980's failed. Because of this apparent rarity, the Oregon Natural Heritage Program, declared the species "extirpated" from the state. Outside of Oregon, LORA has been documented in one county of northeast California, in Nevada, and in Utah (Plants Database, USDA website).

In 1992, LORA was discovered in two locations on the Prairie City Ranger District. Since then, a few additional populations have been found on both Prairie City and Burns Districts. At this time there are 12 populations documented on the Forest. With one other population recently found in the Steens Mountain area, documented reports of this plant is still quite rare.

Existing Conditions

One population of Raven's lomatium (hereafter referred to as LORA) has been found within the planning area. It is located in the Burnt Mountain subwatershed on the southern rim of the Silvies River (T. 20 S., R. 30 E., Sec. 14). There are approximately 500 plants in the population in a scattered distribution over five acres. The area is a plateau with shallow, rocky soil. The site is interspersed with mountain mahogany (*Cercocarpus ledifolius*) and western juniper and surrounded by a mixed conifer forest of ponderosa pine and Douglas-fir. Other species on site are low sagebrush, Hood's phlox (*Phlox hoodii*), meadow pussytoes (*Antennaria corymbosa*), gray rabbitbrush (*Chrysothamnus nauseosus*) and woollypod milkvetch (*Astragalus purshii*).

Effects and determination

Alternative 1 (No Action Alternative)

Under this alternative, there would no activities, therefore, there would be **No Impact** to this species.

Ongoing activities (grazing, fire management, road use) would continue to influence conditions at this site. The effects of these activities on this species in not fully understood at this time.

Common to All Action Alternatives

Noxious Weeds

Manual treatment of noxious weed sites occurring in the watershed would not impact the LORA population because there are no noxious weed sites within the site. This sensitive plant is typically found growing in very shallow, rocky soils, while most weed species prefer deeper, wetter soils. There is little overlap of habitats so the potential for noxious weed encroachment on LORA sites is expected to be very low (Malheur National Forest Noxious Weed Control EA).

Fuels Management

The LORA population is located within fuel blocks 6 and 7. Landscape scale prescribed burning proposed in the watershed would not impact the Lomatium ravenii (LORA) population. This sensitive plant grows in a habitat almost devoid of fuel and, therefore, serves as a natural fuel break and would be unaffected by normal prescribed burning activities. In addition, as a designated ATP, vehicles and machinery used to implement prescribed burning would be prohibited on the site.

Alternative 2 (Proposed Action)

Vegetation Management

Under this alternative, there are precommercial and commercial thinning activities planned for the mixed conifer forest surrounding the scab flat that contains the only documented population of this species in the planning area. Thinning of conifer trees would not impact the LORA population as long as conifer trees are directionally felled away from the surrounding scab flat. In addition, as a designated ATP, vehicles and machinery used to implement thinning would be prohibited on the scab flat.

Road treatment activities

Forest road 3120279 passes through the scab flat where the population of LORA exists. In fact, many LORA plants are actually growing on the road.

There could be direct and indirect effects on the LORA population because of the road closure. The road would be closed with either a post and pole barrier or closure sign. A standard closure structure (earth berm) would be virtually ineffective at the beginning termini of this road because no other natural barriers exist to block vehicles from driving around the structure. A signed closure would be as effective at closing the road as other standard structures and least harmful to the population of LORA. The use of either a post and pole barrier or closure sign would have minimal impact on this population because individual plants could be avoided in the small area needed to install the structure. Prior to installation, a botanist would check the selected closure site to ensure that existing plants are avoided.

By reducing or eliminating motorized vehicle traffic on this road, there may be beneficial indirect effects on LORA. The populations may increase their concentration in the road by colonizing the abandoned wheel tracks. This revegetation could contribute to stabilizing the road against erosion.

Occasional violation of the road closure CFR is likely, especially if a sign is used. This occasional use may be sufficient to prevent significant colonization of the abandoned wheel tracks. Monitoring by a botanist would determine the effectiveness of the closure and if any future management activities would be needed to protect the site.

Cumulative effects

Because this rare plant was discovered recently on the Malheur National Forest, very little is known about the growth habit of LORA and much less is known about the effects of fire, natural disturbance, grazing, and timber management activities on its survival. However, the habitat in which this plant grows influences what kinds of disturbances can occur.

The plant grows on lithosolic soils defined as “a great soil group of azonal soils characterized by an incomplete solum or no clearly expressed soil morphology and consisting of freshly or imperfectly weathered rock or rock fragments” (Brady 1974). This type of soil provides a very low-nutrient, shallow substrate that cannot support many plants; therefore, this habitat is very sparsely vegetated with little fuel to carry a fire, little to no forage to attract grazers, and only scattered western juniper in the overstory.

LORA grows in an environment naturally unaffected by fire because of limited fuels, and appears unaffected by heavy grazing because of sparse grasses. Because of these environmental influences, LORA may not be well adapted to grazing disturbance or fire impacts.

A proposed road closure would discontinue further motorized disturbance of its habitat, and may even encourage LORA to spread into the roadbed and aid in controlling soil erosion.

Determination

With application of recommended mitigation, there would be **No Impact (NI)** on this population of LORA.

Alternative 3

Direct and Indirect Effects

Under this alternative, there are precommercial thinning activities planned for the mixed conifer forest surrounding the scab flat that contains the only documented population of this species in the planning area. Through the application of an ATP, precommercial thinning activities proposed under this alternative would not likely impact this population.

Cumulative effects

Cumulative effects are the same as for the Proposed Action.

Determination

With application of recommended mitigation, there would be **No Impact (NI)** on this population of LORA.

Alternative 4

Direct and Indirect Effects

The effects for all activities under this alternative are the same as under the Proposed Action. Alternative 4 proposes only commercial thinning for the unit adjacent to the LORA site.

Determination

With application of recommended mitigation of a designated 50-foot ATP for the sensitive site is followed, there would be **No Impact (NI)** on the population of LORA because of activities proposed under this alternative.

Alternative 5

Direct and Indirect Effects

This alternative proposes precommercial and commercial thinning in the unit adjacent to the LORA site. The effects are the same as those described under Alternative 2- Proposed Action.

Under this alternative, FS road 3120279 would be left open. The road would likely be used by forest users. This use would likely prevent recolonization of the wheel tracks.

Cumulative effects

Cumulative effects are the same as for the Proposed Action.
Determination

With application of recommended mitigation, there would be **NO IMPACT (NI)** on this population of LORA.

Alternative 6

Direct and Indirect Effects

The effects of all activities, except for silvicultural activities, would be the same under this alternative as under Alternative 2- Proposed Action. No silvicultural activities would occur in or near the documented LORA site under this alternative.

Cumulative effects

Cumulative effects are the same as for the Proposed Action.

Determination

With application of recommended mitigation measures, there would be **No Impact (NI)** on the population of LORA because of activities proposed under this alternative.

Alternative 7-Preferred Alternative

Direct and Indirect Effects

The effects for all activities under this alternative are the same as under the Proposed Action. Alternative 7 proposes only commercial thinning for the unit adjacent to the LORA site.

Determination

With application of recommended mitigation of a designated 50-foot ATP for the sensitive site is followed, there would be **No Impact (NI)** on the population of LORA because of activities proposed under this alternative.

Alternative 7a

Direct and Indirect Effects

The effects for all activities under this alternative are the same as under the Proposed Action. Alternative 7a proposes only commercial thinning for the unit

adjacent to the LORA site.

Determination

With application of recommended mitigation of a designated 50-foot ATP for the sensitive site is followed, there would be **No Impact (NI)** on the population of LORA because of activities proposed under this alternative.

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Appendix C

Status Definitions

Federal Status Definitions

Endangered Species, which are in danger of becoming extinct within the near future throughout all or a significant portion of their range

Threatened Species those likely to become endangered within the foreseeable future.

Species of Concern Former USFWS C2 candidate that have sufficient information to support a proposal to list under the ESA or by ODFW under the OEAS.

Oregon's Threatened and Endangered Species Program Definitions
(under the authority of ORS 496.172, the Oregon Endangered Species Act, 1987)

Sensitive species are broken into four categories defined as follows:

Critical Species for which listing as threatened or endangered is pending; or those for which listing as threatened or endangered may be appropriate if immediate conservation actions are not taken. Also considered critical are some peripheral species that are at risk throughout their range, and some disjunct populations.

Vulnerable Species for which listing as threatened or endangered is not believed to be imminent and can be avoided through continued or expanded use of adequate protective measures and monitoring. In some cases, the population is sustainable, and protective measures are being implemented; in others, the population may be declining and improved protective measures are needed to maintain sustainable populations over time.

Peripheral or Naturally Rare Peripheral species refer to those whose Oregon populations that are on the edge of their range, Naturally rare species are those which had low population numbers historically in Oregon because of naturally limiting factors. Maintaining the status quo for the habitat and population of these species is a minimum requirement. Disjunct populations of several species that occur in Oregon should not be confused with peripheral.

Undetermined Status Animals in this category are species for which status is unclear. They may b susceptible to population decline of sufficient magnitude that they could qualify for endangered, threatened, critical or vulnerable status, but scientific study will be required before a classification can be made.

Conservation Status Ranking

5 Secure-Common, demonstrably widespread and abundant. Typically with considerably more than 1000 occurrences and more than 10,000 individuals.

Secure in Oregon, and essentially ineradicable under present conditions.

4 Apparently Secure-Uncommon but not rare, and usually widespread. Possibly, cause for long-term concern. Typically more than 1000 occurrences and more than 10,000 individuals.

Not rare, and usually widespread in Oregon. Usually more than 100 occurrences.

3 Vulnerable-Vulnerable globally because very rare and local throughout its range, found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extinction. Typically 21 to 100 occurrences or between 3,000 and 10,000 individuals.

Vulnerable in Oregon either because rare and uncommon, or found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically 21 to 1000 occurrences.

2 Imperiled-Imperiled globally because of rarity or because of some factor(s) making it very vulnerable to extinction. Typically 6 to 20 occurrences or few remaining individuals (1,000 to 3,000) or acres (2,000 to 10,000) or stream miles (10 to 50).

Imperiled in Oregon because of rarity or because of some factor(s) making it very vulnerable to extirpation from the state. Typically 21 to 100 occurrences.

1 Critically Imperiled-Critically imperiled globally because of extreme rarity or because of some factor(s) making is especially vulnerable to extinction. Typically 5 or fewer occurrences or very few remaining individuals (<1,000) or acres (<2,000) or stream miles (<10).

Critically Imperiled in Oregon because of extreme rarity or because or some factor(s) making it especially vulnerable to extirpation for the state. Typically 5 or fewer occurrences or very few remaining individuals or acres.

Oregon Natural Heritage Program List (ONHP 2000)

List 1 contains taxa that are threatened with extinction or presumed to be extinct throughout their entire range.

List 2 contains taxa that are threatened with extirpation or presumed extirpated from the state of Oregon. These often peripheral or disjunct species are of concern when considering species diversity within Oregon's borders. They can be very significant when protecting the genetic diversity of a taxon. ORNHP regards extreme rarity as a significant threat and has included species that are very rare in Oregon on this list.

List 3 contains species for which more information is needed before status can be determined, but which may be threatened or endangered in Oregon or throughout their range.

List 4 contains taxa that are of conservation concern but are not currently threatened or endangered. This includes taxa that are very rare but are currently secure, as well as taxa that are declining in numbers or habitat but are still too common to be proposed as threatened or endangered. While these taxa currently may not need the same active management attention as threatened or endangered taxa, they do require continued monitoring.

Appendix A

Determination of Conclusion Definitions for Biological Assessments and Biological Evaluations.

Listed Species

No Effect (NE)

Applied when a project or activity will not have any "effect" on a listed species, or critical habitat.

Conferencing with the US Fish and Wildlife Service or National Marine Fisheries Service is not required.

May Effect-Likely to Adversely Affect (LAA)

If all Forest Plan standards and guidelines, interim direction and Recovery Plan conservation recommendations to protect threatened or endangered species cannot be implemented, a "May Effect-Likely to Adversely Affect" situation likely exists. Informal consultation should be begun to determine if this determination can be avoided.

If this determination is made, formal consultation must be initiated (50 CFR 402.12). Formal consultation must be requested in writing through the forest supervisor (FSM 2670.44) to the appropriate US Fish and Wildlife Service state or field supervisor, or National Marine Fisheries Service office.

May Effect-Not Likely to Adversely Affect (NLAA)

A situation where a "May Effect-Not Likely to Adversely Affect" conclusion could be made if there are possible effects such as displacement or habitat modification, but those effects are insignificant or discountable.

If this determination is made, then written concurrence by the US Fish and Wildlife Service or National Marine Fisheries Service is required (50 CFR 402.13). Requests for concurrence must be initiated in writing from the forest supervisor to the state or field supervisor.

Beneficial Effect (BE)

A situation where an activity or project is determined to substantially improve the habitat or status of a threatened or endangered species, or its habitat.

Written concurrence from the US Fish and Wildlife Service or National Marine Fisheries Service is required. Requests for concurrence must be initiated in writing from the forest supervisor to the state or field supervisor.

Proposed Species

No Effect (NE)

Applied when a project or activity will not have any "effect" on a proposed species, or proposed critical habitat.

Conferencing with the US Fish and Wildlife Service or National Marine Fisheries Service is not required.

Not Likely to Jeopardize the Continued Existence of the Species or Result in Destruction or Adverse Modification of Proposed Critical Habitat (NLJR)

This determination is used when there are effects or cumulative effects, but where such effects would not have the consequence of losing key populations (stocks), would not adversely modify proposed critical habitat, or would not irreversible or irretrievable commit resources that might foreclose options to recovery, should the

species be listed.

Conferencing with the US Fish and Wildlife Service or National Marine Fisheries Service is not required but may be initiated.

Likely to Jeopardize the Continued Existence of the Species or Result in Destruction or Adverse Modification of Proposed Critical Habitat (LJR)

This determination is used when there are significant effects that could jeopardize the continued existence of the species, result in adverse modification or destruction of proposed critical habitat, and/or result in irreversible or irretrievable commitments of resources that could foreclose options to avoid jeopardy, should the species be listed.

Conferencing with the US Fish and Wildlife Service or National Marine Fisheries Service is required if this determination is made.

Sensitive Species

No Impact (NI)

Applied when an activity would have no effect on habitat, individuals, a population or a species.

May Impact Individuals or Habitat, But will Not Likely Contribute to a Trend Toward Federal Listing or Cause a Loss of Viability to the Population or Species (MIIH)

Activities or actions that have effects that are immeasurable or minor, or that are consistent with Conservation Strategies or conservation of the species would receive this conclusion.

For populations that are very small, or vulnerable, each individual may be important for the short and long term viability.

Because sensitive species have been designated based on concerns for their viability, impacts on either individuals or populations are best managed under the umbrella of a Conservation Strategy. Without a Conservation Strategy, the best hierarchical level to base effects of management activities or activities is usually the population, metapopulation or fish stock level.

Will Impact Individuals or Habitat with a Consequence that the Action Will Contribute to a Trend Toward Federal Listing or Cause a Loss of Viability to the Population or Species (WIFV)

Loss of individuals or habitat can be considered significant when the potential effect may be:

1. contributing to a trend towards federal listing,

2. results in a significantly increased risk of loss of viability to a species,

3. or results in a significantly increased loss of viability to a population (stock).

Activities that adversely affect many individuals, or even a few individuals in vulnerable populations, should probably receive this determination unless there is a Conservation Strategy. Activities that are in conflict with the Conservation Strategy or Conservation Agreement would receive this determination.

Significant adverse impacts to sensitive species must not occur until a Conservation Strategy, or similar plan for species conservation, is prepared (FSH 2672.1) The purpose of a Conservation Strategy is to ensure cumulative effects do not result in reduced viability or conditions that result in the need for federal listing.

Beneficial Impact (BI) - Applied when an activity would benefit a sensitive species.

Appendix B

PETS Species List for the Emigrant Creek Ranger District and Occurrence in the Silvies Canyon Watershed Restoration Project Area (Revised 12-2000)

common name	scientific name	status	occurrence in project area
gray wolf	Canis lupus	Endangered	historical
northern bald eagle	Haliaeetus leucocephalus	Threatened	documented
Columbia River bull trou (Columbia River DPS)	Salvelinus confluentus	Threatened	N/A
Mid Columbia River steelhead (mid-Columbia River ESU)	Oncorhynchus (=Salmo) mykiss	Threatened/Designated Critical Habitat	N/A
lynx	lynx canadensis	Threatened	suspected
American peregrine falcon	Falco peregrinus anatum	R-6 Sensitive	suspected
western sage grouse	Centrocercus urophasianus phaios	R-6 Sensitive	documented
gray flycatcher	Empidonas wrightii	R-6 Sensitive	documented
bobolink	Dolichonyx oryzivorus	R-6 Sensitive	N/A
Tri-colored blackbird	Agelaius tricolor	R-6 Sensitive	N/A
Upland sandpiper	Bartramia longicaude	R-6 Sensitive	N/A
bufflehead	*Bucephala albeola*	R-6 Sensitive	documented
wolverine	Gulo gulo luseus	R-6 Sensitive	suspected
pygmy rabbit	Brachylagus idahoensis	R-6 Sensitive	suspected
Pacific fisher	Martes pennanti	R-6 Sensitive	unknown/historical
redband trout	Oncorhynchus mykiss spp	R-6 Sensitive	documented
Malheur mottled sculpin	Cottus bairdi complex	R-6 Sensitive	documented
Columbia spotted frog	Rana luteiventris	R-6 Sensitive	documented
Henderson's ricegrass	*Achnatherum hendersonii and A. wallowensis (Oryzopsis hendersonii)*	R-6 Sensitive	suspected
Deschutes milkvetch	Astragalus tegetarioides	R-6 Sensitive	documented
upward-lobed moonwort	Botrychium ascendens	R-6 Sensitive	suspected
crenulate moonwort	B. crenulatum	R-6 Sensitive	documented
lance-leaved moonwort	B. lanceolatum	R-6 Sensitive	suspected
Mingan moonwort	B. minganense	R-6 Sensitive	suspected
pinnate moonwort	B. pinnatum	R-6 Sensitive	suspected
Peck's long-bearded mariposa-lily	Calochortus longebarbatus var. peckii	R-6 Sensitive	suspected
Back's sedge	Carex backii	R-6 Sensitive	suspected
inland sedge	C. interior	R-6 Sensitive	suspected
Parry's sedge	C. parryana	R-6 Sensitive	suspected
clustered lady's-slipper	Cypripedium fasciculatum	R-6 Sensitive	suspected
Raven's lomatium	Lomatium ravenii	R-6 Sensitive	documented
monkeyflower	Mimulus evanescens	R-6 Sensitive	suspected
least phacelia	Phacelia minutissima	R-6 Sensitive	suspected
Oregon semaphore grass	Pleuropogon oregonus	R-6 Sensitive	suspected
arrowleaf thelypody	Thelypodium eucosmum	R-6 Sensitive	suspected

Documented=in project area, or adjoining lands **Suspected**=potential habitat present **N/A=Not Applicable**

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Oregon Fish & Wildlife Office
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Portland, Oregon 97266
(503) 231-6179 FAX: (503) 231-6195

File 2670

Reply To: 8330.10414 (01)
X-ref:
File Name: Silvies Canyon Watershed Restoration Project
OALS Number: 01-4899

September 26, 2001

Bonnie J. Wood
Forest Supervisor
Malheur National Forest
P.O. Box 909
John Day, OR 97845

Subject: Silvies Canyon Watershed Restoration Project

Dear Ms. Wood:

This letter responds to your request for informal consultation received on May 31, 2001, regarding potential effects to the threatened bald eagle (*Haliaeetus leucocephalus*), resulting from implementation of the Silvies Canyon Watershed Restoration Project. The project was analyzed by Emigrant Creek Ranger District staff, and a determination was made that the action may affect, but is not likely to adversely affect bald eagles.

Project Description:

The proposed action is described in the Biological Assessment (May 2001) and involves a combination of activities including: management of timber stand density and composition; fuels reduction through prescribed burning or mechanical treatments; aspen stand enhancement and protection; and road management projects including closure, decommissioning and reconstruction. The preferred alternative includes extensive treatment areas: 77 miles of year round road closure or decommissioning and 10 miles of seasonal road closure; 202 miles of road reconstruction and 15 miles of temporary road construction, with post treatment closure; 16,186 acres of precommercial thinning and associated fuels treatment; 15,701 acres of thinning and associated fuels treatment (including 121 acres of aspen restoration); 715 acres of juniper thinning; 452 acres of lodgepole pine thinning; and establishment of 47,726 acres within landscape scale fuel treatment blocks with a combination of mechanical and fire treatments prescribed to be implemented over a period of 20 years (including 42,000 acres of prescribed burning).

Within the Bald Eagle Management Area (BEMA), 29 acres of commercial thinning, 144 acres of small diameter tree thinning, and 174 acres of prescribed burning are proposed. Within potential winter roosts, small diameter tree thinning treatments, and subsequent hand piling and burning of slash would occur on 729 acres. Immediately outside the BEMA an additional 926 acres within the same fuel block would be treated with prescribed fire at the same time as that area within the BEMA. Where the precommercial thin overlaps with the prescribed fire area, pretreatment of slash will occur by pile burning after the thinning is accomplished, but before the broadcast burn. Precommercial thinning and prescribed burning treatments are proposed within 1/4 mile of the nest site, and commercial, precommercial and burning treatments are proposed within ½ mile and within line of sight of the nest site.

Species Account:

One bald eagle nest is known in proximity to areas proposed for treatment by this project. This nest has been occupied annually since it was located ten years ago, and has produced young at least seven years within that period. Several treatment units are within the boundary of the Silvies River BEMA.

Two potential winter roost areas (Silvies River Roost and Myrtle Creek Roost) have been identified approximately seven miles southwest of the BEMA. The majority of the area within these potential roost areas are also proposed for treatment.

This proposed action should not affect the amount of habitat suitable for foraging, nesting or roosting by bald eagles. The project will, however, alter the composition and structure of timber stands in proximity to the Silvies River nest site and within two potential winter roost sites in the Silvies Canyon watershed. There is also potential for effects from disturbance during the nesting season or at winter roosts, or due to unplanned effects such as wind throw or loss of containment on prescribed fires.

The nest area contains an overstory of ponderosa pine that became established in small clumps or unevenly spaced single trees 150 to 400 years ago. High frequency and low intensity fires maintained the light stocking level in the understory and resulted in light and patchy mortality in the overstory. With grazing from livestock beginning in the late 1800s and fire suppression beginning in the early 1900's, thick understory conifers became established. This trend in combination with selective logging beginning in the 1940's resulted in stand conditions that are outside of the historic range of variability for the site. The changes in stocking levels, forest mortality, fuel type and abundance promote fire conditions that would likely result in high intensity stand replacing fire events.

Concurrence:

The U.S. Fish and Wildlife Service (Service) has reviewed The Biological Assessment (BA) and supporting documents, along with information provided at a Level 1 Team meeting on October 11, 2000, for the Silvies Canyon Restoration Project. The BA determined that the proposed

action, as described in these documents, may affect but is not likely to adversely affect bald eagles.

Commercial thinning and small tree thinning are prescribed to redistribute growth potential to overstory and mid-story trees, and to increase vigor and longevity of overstory trees currently under stress from competition with understory conifers. These treatments should reduce the susceptibility of the remaining stand to insects and disease. Understory density treatments combined with prescribed fire are intended to reduce ladder fuels and lower fuel loading. These treatments may contribute to a reduction in future fire intensities.

Seasonal operating restrictions are prescribed to be implemented for treatment areas within one mile of the nest site between January 1 and August 31 of each nesting season. In addition, if the winter roosts become active, seasonal operating restrictions are to be implemented from November 15 through April 15.

For the reasons stated above, the Service concurs with the "may affect, but not likely to adversely affect" determination. This review completes informal consultation on effects to bald eagles for activities described within the Silvies Canyon Restoration Project BA, pursuant to section 7(a)(2) of the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq.*) as amended, and the Interagency Consultation Regulations (50CFR 402).

If other listed or proposed species are determined to be potentially affected by this action, consultation for those species should be completed. Should additional information become available on the use of the affected area by bald eagles, or if the effects are determined to be greater than described, re-initiation of consultation may be required. The Forest is encouraged to continue to explore opportunities to manage pro-actively to benefit native species, and to promote the conservation of proposed and listed species as directed by section 7(a)(1) of the Endangered Species Act.

Thank you for your continued cooperation in the effort to conserve and restore native species and the ecosystems they inhabit. If you have questions regarding this response, please contact Dede Steele at our Bend Field Office (541) 383-7146.

Sincerely,

Nancy K. Lee

for Kemper M. McMaster
State Supervisor