APPENDIX XXX

DRAFT Wildlife Biological Assessment / Evaluation for Proposed, Endangered, Threatened, and Sensitive Species

Blue Mountains Forest Plan Revision DEIS (for the Malheur, Umatilla, and Wallowa-Whitman National Forests)

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Introduction

As part of the NEPA decision making process, Forest Service programs or activities are reviewed to determine how they may affect any U.S. Fish and Wildlife Service (USFWS) Threatened, Endangered, Proposed, Candidates, or U.S. Forest Service sensitive species (TEPCS species). The review is conducted to ensure that Forest Service actions do not contribute to a significant loss of species viability or cause a species to move toward federal listing. The review incorporates concerns for sensitive species throughout the planning process, reduces negative impacts to species, and identifies opportunities for mitigation. A biological assessment (BA) is the means of conducting the review and documenting the findings (FSM 2672.41).

This BA will address those species listed as sensitive, threatened, or endangered in Oregon by the Region 6 regional forester and USFWS. The effects of the EIS are discussed for all species except those not having habitat and/or are not known to occupy the project area. General information on species distribution, habitat, and natural history was gathered from:

1. Atlas of Oregon Wildlife (Csuti et al 1997)
2. Mammals of the Pacific States (Ingles 1970)
3. Birds of the Pacific Northwest (Gabrielson and Jewett 1970)
4. natureserve.org Web site (2001)
5. Amphibians of Oregon, Washington, and British Columbia (Corkran and Thoms 1996)
6. Oregon Natural Heritage Database
7. USDA Forest Service field records and biologist observations

The following TEPCS species of terrestrial wildlife are on the Regional Forester's Sensitive Species List (December 2011) and possibly occur within the planning area. Table 1 is a summary of species that are documented (D) or suspected (S) to occur on the Umatilla (UMA), Wallowa-Whitman (WAW), Malheur (MAL) and/or the Ochoco (OCH) National Forest. Effects determinations on species and their habitats uses the procedures and language of a USDA Forest Service letter, "Streamlining Biological Evaluations and Conclusions for Determining Effects to Listed, Proposed and Sensitive Species" signed by Regional Foresters for R1, R4 and R6 (Salwasser et al. 1995). This document includes only those species that are considered terrestrial species and does not address those species that have an aquatic life form (e.g., dragon flies).

Forest plans do not actually authorize site-specific activity but provide the umbrella under which projects are designed. Project implementation under the umbrella of forest plan direction involves analysis based on current and more site-specific information about existing conditions where the actions are proposed. Proposed projects collect more accurate resource information for the local area. Historical conditions, current conditions and desired conditions are analyzed at a finer scale of resolution to better predict

project outcomes. As such, it is assumed that the conditions presented in this analysis are representative of conditions as a whole across the national forest; however, there are sites within the national forest that when analyzed at the project scale will not be representative of the bigger picture (e.g., grazing intensity on an individual allotment that may exceed what is presented for the national forest as a whole). Currently biological evaluations and assessments, providing detailed analysis of potential effects from each project are required for threatened, endangered, proposed, and candidate species and those included in Regional Forester's Sensitive Species list (collectively TEPCS). A determination of effects for TEPCS species would also have to be made for any future project under the direction of the forest plan.

Table 1: Summary of status, occurrence, and effects determination for species of concern within the plan area for each alternative for each national forest

Common Name	Status	Species occurrence for each National Forest					Determination of effect for all alternatives by National Forest		
		UMA-WA	UMA-OR	WAW	MAL	OCH	UMA	WAW	MAL /OCH
Wallowa Rosy-Finch	OR-SEN			D	S		NA	MIIH	MIIH
Black Rosy Finch	OR-SEN			S			NA	MIIH	NA
Canada Lynx	FT	D	D	D	S		NE	NE	NE
Great Gray Owl	WA-SEN	D					MIIH	NA	NA
White-Headed Woodpecker	SEN	D	D	D	D	D	MIIH	MIIH	MIIH
Fringed Myotis	OR-SEN			D	S		NA	MIIH	MIIH
Lewis's Woodpecker	SEN	D	D	D	D	D	MIIH	MIIH	MIIH
Upland Sandpiper	OR-SEN		S	D	D	S	MIIH	MIIH	MIIH
Peregrine Falcon	SEN	S	S	D	D	S	MIIH	MIIH	MIIH
Gray Wolf	FE/SEN	x/D	x/D	x/D	D/D	x/x	MIIH	MIIH	MIIH
Wolverine	FC	S	S	D	S	S	MIIH	MIIH	MIIH
Striped Whipsnake	WA-SEN	S					MIIH	NA	NA
Spotted Bat	OR-SEN			D			NA	MIIH	NA
Pallid Bat	SEN				S		NA	NA	MIIH
Ash-Throated Flycatcher	WA-SEN	D					MIIH	NA	NA
Gray Flycatcher	WA-SEN	S					MIIH	NA	NA
Green-Tailed Towhee	WA-SEN	D					MIIH	NA	NA
Greater Sage Grouse	OR-SEN			D	D	D	NA	MIIH	MIIH
Pygmy Rabbit	OR-SEN				S	S	NA	NA	MIIH
Sharp-Tailed Grouse	OR-SEN			D			NA	MIIH	NA
Preble's Shrew	WA-SEN	D					MIIH	NA	NA
Mountain Goat	WA-SEN	D					MIIH	NA	NA
Grasshopper Sparrow	OR-SEN				S		NA	NA	MIIH
Townsend's Big-Eared Bat	SEN	S	D	D	D	D	MIIH	MIIH	MIIH
Rocky Mountain Tailed Frog	SEN	D	D	D			MIIH	MIIH	NA

Black Swift	OR-SEN			D			NA	MIIH	NA
Harlequin Duck	SEN			D			NA	MIIH	NA
Bufflehead	OR-SEN			S	D	D	NA	MIIH	MIIH
Bald Eagle	SEN	D	D	D	D	D	MIIH	MIIH	MIIH
Mountain Quail	WA-SEN	D					MIIH	NA	NA
Columbia Spotted Frog	OR-SEN		D	D	D	D	MIIH	MIIH	MIIH
Painted Turtle	OR-SEN		S				MIIH	MIIH	MIIH
Tricolored Blackbird	OR-SEN					S	MIIH	MIIH	MIIH
Bobolink	SEN				D		NA	MIIH	NA
Western Bumblebee	OR-SEN			D			NA		NA
Meadow Fritillary	WA-SEN	S	S	S				NA	NA
Silver-Bordered Fritillary	OR-SEN			D	D	S	NA		
Barry's Hairstreak	WA-SEN	D						NA	NA
Johnson's Hairstreak	SEN	D	D	S	S	S			
Intermountain Sulphur	OR-SEN	S	S	D					NA
Lustrous Copper	WA-SEN	S						NA	NA
Yuma Skipper	OR-SEN		S	D					NA
Great Basin Fritillary	WA-SEN	D						NA	NA
Salmon Coil	WA-SEN	S						NA	NA
Humped Coin	WA-SEN	D	S	S				NA	NA
Shiny Tight Coil	WA-SEN	D	S	S	S			NA	NA
Fir Pinwheel	SEN	D	D	D					NA

Status: FE= listed as Federally Endangered; FT= listed as Federally Threatened; FC= listed as a Federal Candidate for listing; SEN=Sensitive species in both states; OR-SEN=Sensitive only in Oregon; WA-SEN=Sensitive only in Washington

Determination: Listed species: NE=No Effect, LAA=May Affect-Likely to Adversely Affect, NLAA=May Affect-Not Likely to Adversely Affect, BE=Beneficial Effect
Sensitive species: 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, WIFV-Will Impact individuals or habitat with a consequence that the action may contribute to a trend towards federal listing or cause a loss of viability to the population or species, BI=Beneficial Impact

Assumptions

Forestwide direction for each of the Blue Mountains national forests and all alternatives is to move towards HRV. Use of HRV relies on two concepts: that past conditions and processes provide context and guidance for managing ecological systems today, and that disturbance-driven spatial and temporal variability is a vital attribute of nearly all ecological systems. Therefore it is assumed that managing for HRV will provide adequate amounts of habitat for viable species, as they would have survived this level of habitat in the past in order to be present today (Landres et al. 1999). In some cases, standards and guidelines have been included to improve safeguards for certain habitat features of some species. All alternatives assume that direction given in FSM 2670 and FSH 2609 will be followed (e.g., FSH 2670.21 Threatened and Endangered Species 1. Manage National Forest System habitats and activities for

threatened and endangered species to achieve recovery objectives so that special protection measures provided under the Endangered Species Act are no longer necessary; or FSH 2670.22 Sensitive Species 1. Develop and implement management practices to ensure that species do not become threatened or endangered because of Forest Service actions.).

One of the analysis assumptions made for all species, is through the course of implementing projects during the next 10 to 15 years that follow the guidance of the forest plan, at least one individual of all species of conservation concern will be impacted. Activities that would disrupt an individual's normal behavior patterns for such things as breeding, foraging and sheltering would be considered as impacting that individual. For example, during the life of the plan, it is assumed that wildland fire will be used as a management tool for several thousand acres to help achieve the desired conditions outlined in the plan. Inherently the use of fire will disrupt the normal behavior of species due to smoke and could actually cause mortality in those less vagile species such as land snails. Additionally snags and down logs are vulnerable to loss from fire (Bagne et al. 2008; Randall-Parker and Miller 2002) making it a reasonable assumption that during 10 to 15 years of implementing the plan at least some snags/downed logs that provide shelter for bats or snails, or that provide nest sites, plucking posts or foraging structure for birds will be lost, disrupting an individual's behavior. Another example would be ground nesting species. For example, Fondell and Ball (2004) documented nests of grassland species in Montana that were destroyed by livestock trampling. Although considered a random event (Jensen et al. 1990) with a low probability of occurrence (Beck and Mitchell 2000), during the 10-15 year plan period with domestic livestock grazing occurring across much of the national forests, it is highly likely that at least some individuals will at least be disturbed from their nest sites. And although Hamann et al. (1999) focused on birds, other authors (Boyle and Samson 1985; Gaines et al. 2003; Taylor and Knight 2003) have documented the impacts of recreation on wildlife, which runs the continuum of responses from habituation at one extreme and habitat abandonment at the other. Again whether it is a snowmobile that disturbs a wolverines foraging behavior to a hiker scrambling up a talus slope crushing a snail, during the life of the plan, some individual species of conservation concern will most likely be impacted by recreational activity.

Focal Species

To facilitate viability assessments for the DEIS, species were grouped into Family and Group similar to the method used for ICBEMP assessments (Wisdom et al. 2000, Raphael et al. 2001). Species groups are defined by having similar habitat requirements. A species selected from the group becomes the species upon which the assessment is focused. The focal species approach is an attempt to streamline the assessment of ecological systems by monitoring a subset of species and can be seen as a pragmatic response to dealing with ecosystem complexity (Noon 2003, Roberge and Angelstam 2004). The key characteristic of a focal species is that its status and trend provide insights to the integrity of the larger ecological system to which it belongs (Lambeck 1997, Noss et al. 1997, Andelman et al. 2001, Noon 2003). Focal species serve an umbrella function in terms of encompassing habitats needed for other species, are sensitive to the changes likely to occur in the area, or otherwise serve as an indicator of ecological sustainability (Lambeck 1997, Noss et al. 1997, COS 1999, Andelman et al. 2001). The viability of the focal species is assumed representative of a group of species with similar ecological requirements and this group is assumed to respond in a similar manner to environmental change. In addition, the focal species is assumed to have more demanding requirements for those factors that are putting other group members at risk of extinction (Andelman et al. 2001).

Several of the TEPCS species were analyzed in detail as focal species in the viability assessment for alternative B (Wales et al. 2011). In other instances, species discussed in this document were represented by a focal species identified for the DEIS. Focal species are intended to represent ecological conditions that provide for viability of other species in the group (USDA 2010). Focal species represent the species group in that, by providing for adequate amounts and distribution of habitat and managing risks for focal species it is assumed this will provide the ecological conditions needed to maintain viability of other

associated species (*ibid*). The long-term sustainability of the focal species is assumed to be representative of a group of species with similar ecological requirements and this group is assumed to respond in a similar manner to environmental change (Suring et al. 2011).

To more thoroughly understand the ecological requirements of the TEPCS species, it was necessary to review other information beyond source habitats for each species. Besides focusing on habitats that are key to the population growth of species, it is acknowledged that factors beyond macro-vegetation can affect population persistence. Additional information on risk factors, fine scale habitat features, home-range size, and species ranges for each species of conservation concern were considered (Andelman et al. 2001), and where necessary disclosed in this document.

Environmental outcomes defined in Raphael et al. (2001) were used as a basis to describe five viability outcomes, A through E (see Wales et al. 2011). Viability outcome models produced percent likelihoods for each species for each of the 5 outcomes. The Blue Mountains Plan Revision Team decided to assign levels of concern for viability (Low, Moderate, or High) based on the primary viability outcome (i.e., outcome >=60%). Levels of concern were based on a comparison of current viability outcome compared to historical viability outcome and based on the matrix in Table 1-VO.

Table 1-VO: Level of concern for viability matrix based on the historical and current viability outcomes from the focal species assessment models (Wales et al. 2011).

		Historical Viability Outcome				
		A	B	C	D	E
Current Viability Outcome	A	L	L	L	L	L
	B	L	L	L	L	L
	C	M	M	L	L	L
	D	H	H	M	M	M
	E	H	H	H	M	M

When there was not a primary viability outcome (i.e., no single outcome >=60%), the 2 highest likelihood outcomes were used to assign a level of concern. This resulted in some Moderate/Low and Moderate/High levels of concern. Although some of these focal species had low viability scores, there was no indication that implementing any of the alternatives would threaten the viability of any of those species to the extent that would cause a trend towards Federal listing. Viability for a species is less of a concern if there has been no, or little, reduction in environmental conditions from historical conditions.

Level of Concern Definitions

Low concern for viability – Current habitats are of moderate or higher abundance and quality relative to historical conditions, and are widely distributed or if gaps in distribution are present they are similar to historical distribution of habitat.

Moderate concern for viability – Current habitat is of lower abundance and/or quality relative to historical conditions. Habitat is moderately well distributed across the planning area but likely with gaps that may limit intra-specific interaction of species with low dispersal ability. For some species with relatively narrow habitat associations and/or patchy distribution, this may have been the historical condition. Habitat quality factors or risks may increase concerns for species viability as amount and distribution of habitat departs from historical conditions.

High concern for viability – Current habitats are highly departed from historical amounts and/or are more patchily distributed than historical conditions. Intra-specific interactions of species with low dispersal ability may be compromised. Non-habitat quality factors or risks increase concern for viability of some species because amount and/or distribution of habitat are highly departed from historical conditions.

Federally listed, proposed or candidate species

Gray Wolf (Federally listed Endangered/Regional Forester Sensitive Species)

Records indicate all wolves were eliminated from the Blue Mountains in the early 1900s after Euro-American settlement. In January 1995, wolves were transplanted from Canada, to the Salmon River drainage in central Idaho. In the winter of 1998-1999, a collared wolf from this population (B-45-F) moved into Northeast Oregon. It roamed over all three National Forests in the Blue Mountains until it was captured and returned to Idaho. Another collared wolf, from the White Cloud pack in Idaho, was killed on the freeway just south of Baker City in May 2000. Wolves have successfully colonized portions of Idaho, and more recently have become established in Northeast Oregon, confirming that suitable wolf habitat exists.

Life History and Habitat Description

Habitat preference for the gray wolf appears to be more prey dependent than cover dependent. The wolf is a habitat generalist inhabiting a variety of plant communities, typically containing a mix of forested and open areas with a variety of topographic features (Mech et al. 1988; Mladenoff et al. 1999; Witmer et al. 1998). Historically, they occupied a broad spectrum of habitats including grasslands, sagebrush steppe, and coniferous, mixed, and alpine forests. Wolves prefer fairly large tracts of roadless country; generally avoiding areas with an open road density greater than one mile per square mile (Mech et al. 1988; Thiel 1985; Witmer et al. 1998). Gray wolves have extensive home ranges and specific habitat requirements for denning, rearing young, and foraging. Dens are usually located on moderately steep slopes with southerly aspects within close proximity to surface water. Rendezvous sites, used for resting and gathering, are complexes of meadows that have adjacent hillside timber with nearby surface water. Both dens and rendezvous sites are often characterized by having forested cover nearby, removed from human disturbance (Trapp 2004). Wolves seem to require areas with low human populations, low potential for human interactions, high prey densities, and secluded denning and rendezvous sites (USDI 1987; Witmer et al. 1998). Wolves are strongly territorial; defending an area of 75-150 square miles, and home range size and location is determined primarily by abundance of prey. Wolves are limited by prey availability and are threatened by negative interactions with humans.

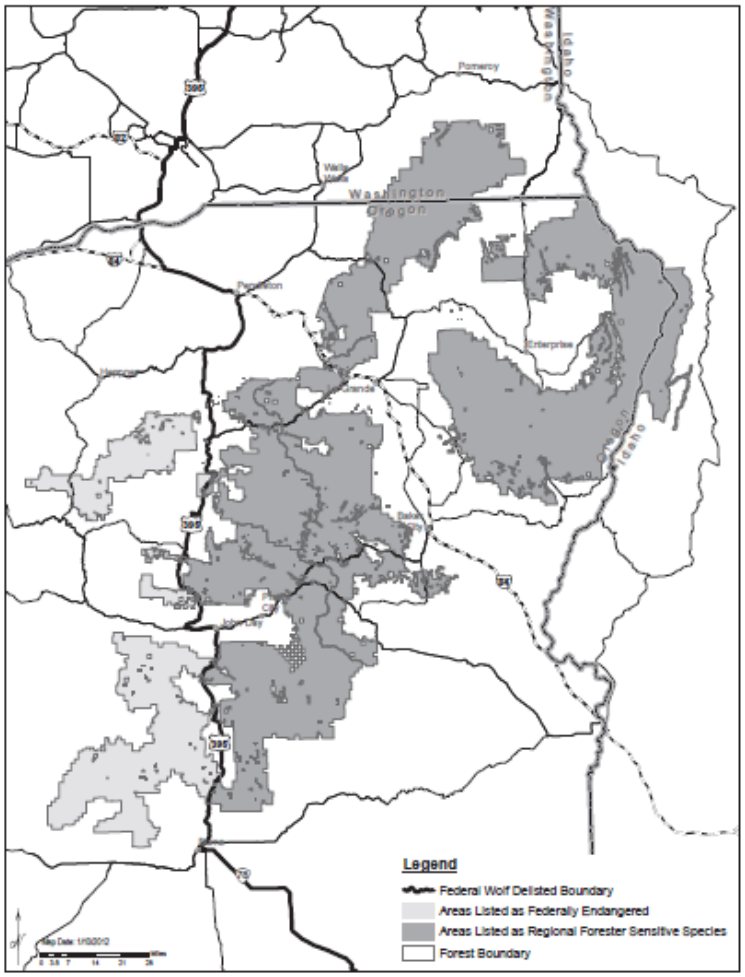
Wolves prey primarily on large ungulates such as elk and deer (Boyd et al. 1994; Fritts et al. 1994; Kunkel et al. 1999). In northwestern Montana white-tailed deer comprised 83 percent of wolf kills, whereas elk and moose comprised 14 percent and 3 percent, respectively (Kunkel et al. 1999). However, 87 percent of wolf kills in Yellowstone National Park during 1999 were elk (Smith et al. 2000). Big game calving and fawning areas are important foraging areas for wolves as they often selectively prey upon newborn ungulates (Hamlin and Cunningham 2009). Alternate prey typically consists of smaller mammals and birds, such as, beaver, ground squirrels, rabbits, and grouse (Boyd et al. 1994; Witmer et al. 1998). Inadequate or deteriorated ungulate winter range can limit big game populations. It is not uncommon to observe wolves “mousing” in grassy meadows much like coyotes and red fox. Individuals may take livestock as secondary prey when ungulates are less vulnerable or available (Witmer et al. 1998).

The widely accepted description of gray wolf habitat in the northern Rocky Mountains (including the Intermountain West) includes two primary factors: 1) adequate prey and 2) human tolerance. Specific habitat characteristics do not seem to be particularly important to wolves as long as there is adequate prey. The second factor in the success of wolves is whether or not they are killed through poaching or lethally removed following livestock depredations. Although some published reports indicate that low road densities or low human disturbance are important to wolves, they have demonstrated a greater tolerance of human presence and disturbance than previously thought characteristic of the species. Previously it was believed that higher elevation public lands would comprise the primary occupied habitats (Fritts et al.

1994). While some packs have established territories in backcountry areas, most prefer lower elevations and gentle terrain where prey is more abundant, particularly in winter (Boyd and Pletscher 1999). In some settings, geography dictates that wolf packs use or travel through private lands and coexist in close proximity with people and livestock. Even though wolves appear to prosper in roaded landscapes, disturbance of wolves at den and rendezvous sites during particular times of the year could lead to displaced wolves or predispose wolf pups to predation or starvation. Gray wolves have been documented to abandon den sites if disturbed by humans (Thiel 1985). Due to the ability of gray wolves to thrive under a variety of land uses, the U.S. Fish and Wildlife Service concluded that successful wolf recovery in the northern Rocky Mountains does not depend on land-use restrictions, with the possible exception of temporary restrictions around active den sites on federally managed lands (USFWS 2003). The most important criteria for gray wolf management and recovery is reducing the mortality of wolves by humans and managing for an abundant prey base.

Analysis Area Information

On April 2, 2009, the USFWS published a final rule that established a Distinct Population Segment (DPS) of the gray wolf in the Northern Rocky Mountains, and revised the list of endangered and threatened wildlife by removing wolves within the Northern Rocky Mountains DPS boundaries, except in Wyoming (USFWS 2009a). This rule was vacated in 2010 and then effective May 5, 2011, the US Fish and Wildlife Service reinstated the terms of the 2009 final rule that removed the Northern Rocky Mountain Distinct Population of the gray wolf from the Federal Endangered Species List as directed by the FY 2011 Appropriations Bill. Currently, the gray wolf is considered a Region 6 Sensitive Species on that portion of the Umatilla National Forest, Wallowa-Whitman and the Malheur National Forest east of State Highway 395 and federally listed as Endangered west of State Highway 395. West of State Highway 395, the wolf is listed as Federally Endangered. No critical habitat has been proposed or designated in the Northern Rocky Mountains (USFWS 2011).



As of December 2011 ODFW estimated a minimum wolf population of 29 individuals and recognized four wolf packs in northeastern Oregon/southeastern Washington all of which occur within the Northern Rockies DPS and therefore are considered Forest Service sensitive species (Morgan 2011). Only the Umatilla National

Forest and the Wallowa-Whitman National Forest s would currently be considered occupied (Figure wlf-1).

The Imnaha pack was first documented in 2009. It has established a territory in Wallowa County, and based on telemetry work conducted by ODFW contains a mixture of National Forest and private lands (Figure wlf-2). The Imnaha pack has fluctuated from as many as sixteen wolves to four adults and one pup in December of 2011 (Morgan 2011), and is known to have reproduced in 2009 and 2010.

The Wenaha pack was documented in 2008 and was counted as a breeding pair in 2010 as it consisted of three adults and three pups. It utilizes habitat on the Umatilla National Forest in addition to adjacent private and state lands. Although telemetry data is not being collected on this pack, other monitoring methods suggest that five wolves (at least one pup) currently use public lands (Morgan 2011).

The Walla Walla pack was first documented in January 2011 and is near the Washington border. In December a minimum of eight wolves including a minimum of 3 pups were documented confirming the pack consisted of a breeding pair. It also is using a combination of public and private lands.

The Snake pack was first documented in October, 2011by area hunters and trail cameras. In December 2011, ODFW confirmed tracks of five wolves and review of the photographs indicated that at least one pup was produced in the area. The new pack however, will not be considered a "breeding pair" unless two or more pups are documented.

Reports of individual and multiple wolves are sporadic in other areas of northeast Oregon. Additional resident wolf activity was confirmed in 2011 in Umatilla County and in Minam, Sled Springs and Mt. Emily game management units.

Figure wlf-1: Location of gray wolf packs as depicted on Oregon Department of Fish and Wildlife web site.

Humans have indeed changed the landscape to great extent during the past 150 years. Wolves are habitat generalists, and thus a wide range of Oregon ecosystems are theoretically capable of supporting wolves. Nevertheless, it will be difficult to predict the specific areas in the state wolves will occupy first, and also difficult to predict where it will be possible for the species to persist. The ability to persist will be determined largely by the degree of human tolerance for the species across the state's vast rural landscapes (ODFW 2005 (updated 2010)).

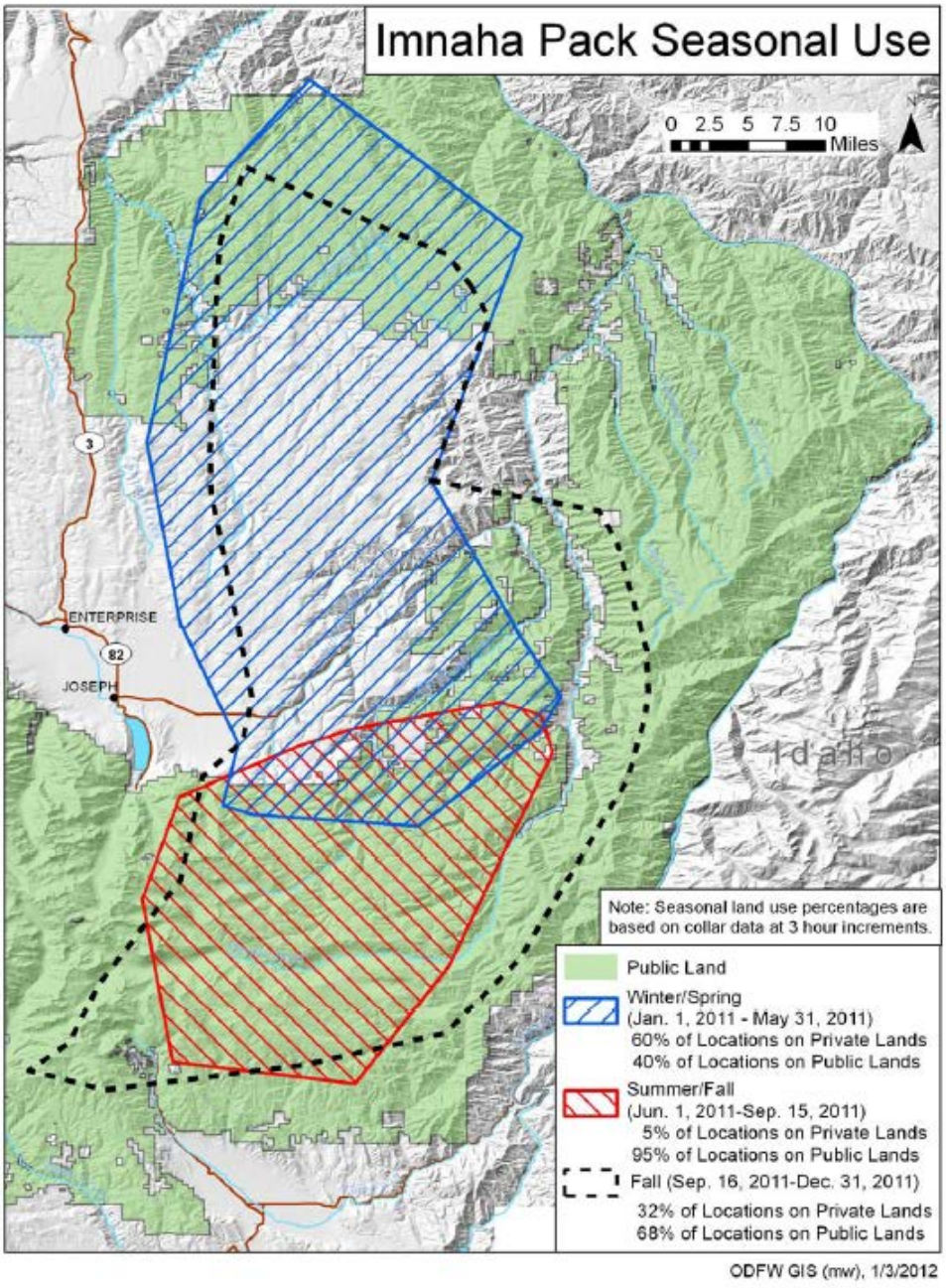


Figure wlf-2. Use pattern as documented by Oregon Department of Fish and Wildlife (Morgan 2011)

Because wolves are habitat generalists that hunt and den over a wide variety of vegetation types, the alternatives would not have significant effects on the amount and distribution of habitat (issue 2) used by wolves or their prey species (USFWS 2003). Gray wolf populations are primarily limited by non-habitat factors, such as direct interaction with humans that cause mortality (Bangs et al. 1998) and to a lesser degree denning disturbance (ODFW 2005 (updated 2010)). In some areas, wolves are capable of occupying habitats that might be considered marginal based on human population densities and land management practices, with few conflicts; however most of the known wolf mortality that has occurred within the DPS has been in response to livestock depredations. Wolves that have a history of livestock depredations are lethally controlled by agents of USDA-APHIS Wildlife Services. Most of the depredation problems in Oregon have been on the Wallowa-Whitman National Forest.

Wolves are most vulnerable to disturbance while denning and rearing pups. Wolf interaction with humans is perhaps most influenced by human accessibility to remote habitats (issue 1). Two measures have been used to assess disturbance impacts on wolves; miles of desired open motorized routes and acres of management areas with limited motorized access.

Determination of Effect

Exposure to humans varies under all alternatives due to desired density of open motor vehicle routes as well as the expanse of the various management areas. For example, although alternative C has the same desired density of motorized routes in MA 4 as alternatives B, E, and F, it has less than half the acres in MA 4. Figure 3x-WLF1 attempts to demonstrate the difference in risk based on the composite of route density and acres in general forest (MA 4). It is comparing against the proposed action, because a single composite for existing condition could not be generated.

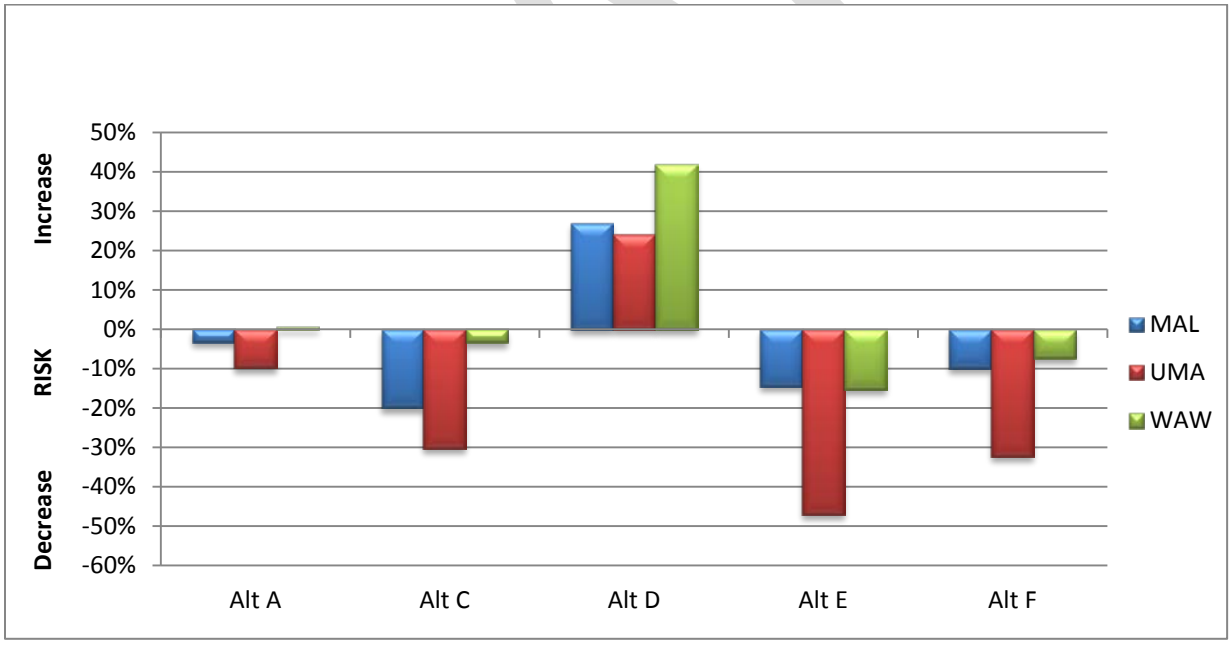


Figure 3x-WLF1. The change in risk of human interaction with the gray wolf in comparison to Alternative B, based on desired open motor vehicle route density within the general forest Management Area on the three national forests (NEED TO CHANGE DUE TO CHANGE IN E/F)

Additional open motor vehicle routes would likely be obliterated or closed depending on protection and restoration needs and funding available from other resources, such as soil, water, fish and wildlife. The reduction in open motor vehicle routes would have the indirect effect of reducing the likelihood of adverse human interaction with wolves in the form of shooting, harassment, vehicle collisions, and other

forms of threats. Open motor vehicle route reduction would likely continue over the long term in gradually diminishing amounts until the national forests have transportation systems that achieve a more desirable balance between access needs, resource impacts, and effective open motor vehicle route maintenance capability.

Another measure of solitude provided wolves would be the number of acres that would generally be regarded as roadless or non-motorized and areas of limited motor vehicle use. Areas without open motor vehicle routes are generally represented by management allocations, such as MA 1A Congressionally Designated Wilderness Areas, MA 1B Preliminary Administratively Recommended Wilderness Areas, MA 2B Research Natural Areas and MA 3A Backcountry (non-motorized use). Allocations to these management areas will vary between alternatives as displayed in figure 3x-SEC. With the exception of the no action alternative (A) all alternatives have more acres allocated to management areas that would have the least amount of human disturbance. Alternative C would have the most acres having the least amount of human disturbance compared to alternative B.

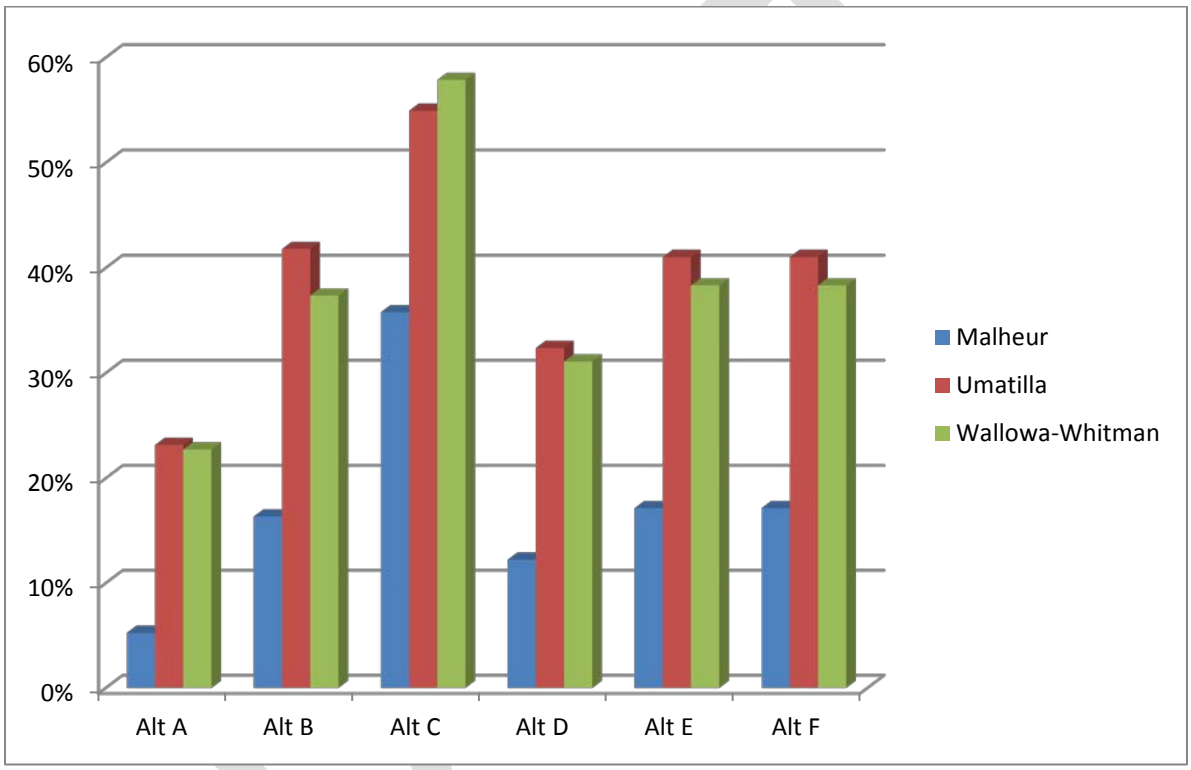


Figure 3x-SEC. Percent of each national forest that would be considered secure areas for wildlife for each alternative.

Malheur National Forest

As indicated above, depending on location the wolf is either federally listed as endangered or is a Regional Foresters sensitive species. Currently there are no known packs on the Malheur National Forest, although young wolves are beginning to explore more of eastern and central Oregon. Because the Malheur is unoccupied, it is not expected that individual wolfs would be affected by implementing any of the management alternatives. Alternative C does the most for reducing the risk of encounters between wolves and humans, since it has the most area in backcountry management areas (figure 3x-SEC) which effectively reduces the total open route density on the Forest (figure 3x-WLF1).

Table 3x-OSV: Percent of each National Forest that is suitable for winter motor vehicle use by alternative.

National Forest	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
Malheur	90%	91%	64%	94%	91%	91%
Umatilla	77%	76%	46%	78%	71%	71%
Wallowa-Whitman	74%	76%	40%	76%	70%	70%

Additionally, it is anticipated that the Malheur National Forest will eliminate cross-country travel except for over-the-snow vehicles (OSV) by the time this plan is implemented to be in compliance with national direction regarding travel management. Although Creel et al. (2002) suggests that stress-hormone levels in wolves increases with snowmobile usage, it was not clear that it resulted in changes in population dynamics. Alternative C is the only alternative that reduces OSV impacts on the Malheur National Forest (Table 3x-OSV), mostly due to the incorporation of Management Area 3C which restricts over the snow travel, except on designated routes. None of the alternatives are anticipated to reduce prey abundance for wolves and even though Alternative C would provide the greatest reduction in potential human interaction with wolves; the management direction of any of the alternatives would continue to contribute to the viability and persistence of the wolf on the Malheur National Forest during the expected life of the forest plan. All alternatives incorporate standard WLD-HAB-6 S-1, which prohibits management activities near denning sites.

Under any alternative it is likely that proposed management activities **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Under any alternative it is likely that proposed management activities may affect the gray wolf but is not likely to adversely affect the gray wolf or its habitat in those areas where it is a federally listed species.

Because:

1. USFWS has acknowledged that habitat is not the primary issue regarding wolves- but rather the acceptance by humans.
2. Currently there are no known breeding packs occupying the Malheur
3. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
4. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Umatilla National Forest

Similar to the Malheur National Forest, the wolf is federally threatened on a portion of the Umatilla National Forest, but a sensitive species on over 80 percent of the Forest. Currently the Forest is occupied by at least one pack, and most of the known locations of wolves have been in that portion of the Forest where the wolf be considered a sensitive species. The potential impacts of roads to wolves would be similar to the Malheur National Forest with the exception that summer cross country travel has already been prohibited. Risk from OSV use is also different, with a noticeable reduction in alternatives C, E and F, although the reductions in Alternative C is more substantial (Table 3x-OSV). Again there is no anticipated reduction in prey availability for the wolf and all alternatives incorporate standard WLD-HAB-6 S-1 which prohibits management activities near denning sites. As indicated, the portion of the Umatilla currently known to be occupied by wolves is that portion where the wolf would be considered a sensitive species. Forest plans do not directly implement activities that could cause disturbance to

individual wolves. However, it is assumed that the probability exists that at least one project implemented under the guidance of the forest plan could disturb an individual wolf. Using this premise, implementing the plan might affect individuals but it is felt that implementing the management direction for any of the alternatives would result in the continued viability and persistence of the wolf on the Umatilla National Forest during the life of the forest plan.

Under any alternative it is likely that proposed management activities **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Under any alternative it is likely that proposed management activities may affect the gray wolf but is not likely to adversely affect the gray wolf or its habitat in those areas where it is a federally listed species.

Because:

1. USFWS has acknowledged that habitat is not the primary issue regarding wolves- but rather the acceptance by humans.
2. Currently known breeding packs only occupy that portion of the Umatilla where they are not federally listed.
3. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
4. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Wallowa-Whitman National Forest

The Wallowa-Whitman National Forest is occupied by at least one pack and the entire Forest is within the area that the wolf was delisted; as such the wolf is considered a sensitive species for the Forest. Similar to the Umatilla National Forest Alternative C does the best at reducing the potential for human/wolf conflict based on open route density (Figure 3x-WLF1). Alternative C also has the most acres in back country Management Areas that minimize motorized access (Figure 3x-SEC) and reduce areas for OSV winter use (Table 3x-OSV) which may be of a greater benefit as the change in road density is that dramatic.. Like the Malheur National Forest, it is assumed that the Wallowa-Whitman will not allow cross-country summer motorized use by the time this plan is implemented. There is no anticipated reduction in prey availability for the wolf and all alternatives incorporate standard WLD-HAB-6 S-1 which prohibits management activities near denning sites. As indicated, the Wallowa-Whitman is currently known to be occupied by wolves, which would be considered a Forest Service sensitive species. Forest plans do not directly implement activities that could cause disturbance to individual wolves. However, it is assumed that the probability exists that at least one project implemented under the guidance of the forest plan could disturb an individual wolf. Using this premise, implementing the plan might affect individuals but it is felt that implementing the management direction for any of the alternatives would result in the continued viability and persistence of the wolf on the Wallowa-Whitman National Forest during the life of the forest plan.

Under any alternative it is likely that proposed management activities **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. USFWS has acknowledged that habitat is not the primary issue regarding wolves- but rather the acceptance by humans.

2. Although the Wallowa-Whitman is currently occupied by breeding packs, the entirety of this forest is within the area where the gray wolf in no longer Federally listed.
3. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
4. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on Gray Wolf

The gray wolf has circumpolar distribution in the northern latitudes. It occurs in Europe, Asia and North America. In North America it is considered common in Alaska and most of Canada. Within the recovery areas of the U.S., populations have been increasing, with the largest populations in Minnesota, Michigan and Wisconsin.

Eastern Oregon has recently been colonized by wolves thought to have originated in Idaho. Gray wolf populations are increasing in eastern Oregon and this trend is likely to continue over the short term due to high prey populations, decreasing open motor vehicle route density across the Blue Mountains and management direction to protect denning wolves, and the formation of new packs. As populations increase wolves will continue to disperse into new areas, eventually increasing contact with human populations and activities. Habitat does not appear to be limiting, and therefore the greatest threat is mortality due to interaction with humans. Both legal and illegal killing of individuals, both on and off of public lands is of concern. Hunting in Idaho could potentially pressure more individuals to relocate to Oregon. Increased livestock depredation and interaction with humans could lead to lethal removal of individuals by the state game department as well as the illegal shooting of individuals, which has already occurred. Over the long term, human social pressures will likely restrict the distribution of wolves to areas of limited human occupation and away from concentrated domestic livestock production. In the end, human tolerance and lack of persecution will be needed to achieve long-term successful recovery.

Canada Lynx (Federally Threatened)

Life History and Habitat Description

Lynx are medium-sized cats that are strongly associated with boreal forest habitats. Like most cats, lynx are mainly nocturnal, being most active at sunrise and sunset. Lynx are typically associated with large continuous tracts of boreal or coniferous forest in Alaska and Canada. They are also found in isolated higher-elevation spruce, sub-alpine fir, and lodgepole pine forests in the western United States (Koehler and Brittell 1990; Ruediger et al. 2000). Habitat selection is associated with the habitat requirements of its primary prey, the snowshoe hare (Koehler and Aubry 1994). In general, mixed-conifer stands are often preferred by hares for cover with openings of shrubs for feeding. Lodgepole pine is often a major component of this habitat, especially within the early to mid-successional stages. Ruggerio et al. (1994) suggest there is a general pattern of decreasing habitat suitability for lynx with decreasing latitude in the Rocky Mountains. Historic fire patterns played a large role in maintaining the habitat components for both snowshoe hare and lynx. Stand-replacing fires maintained a landscape mosaic that provided ideal snowshoe hare and lynx habitat.

Snowshoe hares are the primary prey of lynx, comprising 35 to 97 percent of the diet throughout the range of the lynx (Ruggerio et al 1994). Other prey species include red squirrel, grouse, flying squirrel, ground squirrel, porcupine, beaver, voles, shrews, and fish. During the cycle when hares become scarce, the proportion and importance of other prey species, especially red squirrel, increases in the diet. When prey is scarce, their home range increases and individuals may become nomadic. Home range is usually between 24 to 48 square kilometers. The range of males is larger than that of females. Population density

is usually less than 10 animals per 100 square kilometer, depending on prey availability. In the northern boreal forest, lynx populations seem closely related to the 10-year population cycle of snowshoe hare. There is generally a two-year lag of the lynx population behind the snowshoe hare cycle. Individuals are usually solitary.

Lynx breed from March through May in their northern range, and gestation lasts 62 to 74 days. A female produces one litter of three to four young every one to two years. Young stay with the mother until next mating season or longer. Prey scarcity may suppress breeding.

Deep snow and extreme cold are often associated with lynx habitat. This species remains and thrives under these conditions due to its physical adaptations to low temperatures, deep snow, and ability to successfully exploit the snowshoe hare (Koehler and Brittel 1990, Ruediger et al. 2000). These adaptations provide lynx a competitive advantage over potential competitors, such as bobcats or coyotes (Ruediger et al. 2000). Other important habitat needs for lynx include mature forest for denning and resting and thickets for feeding (Koehler and Aubry 1994). Primary denning areas are often in large hollow logs, beneath windfall or upturned roots, or in brush piles in dense thickets.

The Canada lynx was listed under the endangered species act as Threatened on March 24, 2000 (USFWS 2000). The Forest Service and the US Fish and Wildlife Service signed a Canada Lynx Conservation Agreement (LCAS) in 2000 (Ruediger et al. 2000) which committed the Forest Service to using the LCAS in determining effects of projects on the lynx until forest plans could be revised to adequately conserve the lynx. This agreement was revised in 2005, and provided for the consideration of the LCAS only in habitats that are currently occupied by lynx. The agreement was further revised on May 12, 2006 (Kimball and King 2006) to define "occupied habitat" and identify National Forests currently occupied by lynx. This amendment and the regional forester's letter dated June 20, 2006 (USDA 2006) identified the Umatilla, Wallowa-Whitman and Malheur National Forests as unoccupied habitat. As unoccupied habitat, the Conservation Agreement does not apply to these three national forests. There is no requirement to manage for lynx in unoccupied habitat. The unoccupied determination was based on a lack of verified lynx observations (National Lynx Survey results, Forest and District databases, etc.) and a lack of evidence of lynx reproduction.

Critical habitat designations were revised and the Final Rule published in the Federal Register on February 25, 2009 (USFWS 2009) and became effective on March 27, 2009. Five critical habitat units were identified in the final rule: (1) Maine, (2) Minnesota, (3) Northern Rockies, (4) North Cascades, and (5) Greater Yellowstone. Critical habitat for the lynx was not identified on the Umatilla, Malheur or Wallowa-Whitman National Forests.

Snow tracking surveys conducted across the Forests in the mid-1990s for wolverine, fisher, American marten, and lynx have failed to identify lynx tracks. Snow tracking surveys in winter 2011 along the same survey route failed to detect these species. Field surveys in 1999, 2000, and 2001 using the National Lynx Detection Protocol (McKelvey et al. 1999) also failed to detect lynx on any of these 3 National Forests.

Canada lynx were identified as a focal species representing boreal forests (USDA 2010), but because of their rarity in the Blue Mountains were not used in that capacity for the plan revision effort. According to Witmer et al. (1998), the two issues identified for the lynx in the Columbia Basin, were 1) conservation of appropriate mosaics of seral stages in boreal forest habitat, lynx require early seral stage boreal forest habitats for foraging and small patches of late-successional forest to provide for denning opportunities and 2) harvest and human disturbance. An increase in roads through lynx habitat increases human access, resulting in more human lynx encounters, as lynx also use roads for hunting and travel (Koehler and Aubry 1994). Increased road density potentially leads to increases in poaching, road kill, and incidental mortality of lynx while increased snowmobile use in key lynx habitat may allow access by other, competing predators (McKelvery et al. 2000).

The concern for the viability of the two focal species analyzed for the cold forest resulted in a decreasing the level of concern (boreal owl) or the maintenance of a low level of concern (water vole). At the broad scale, this would indicate habitat for the lynx is being maintained or moved towards HRV. This is also supported by the forest vegetation analysis (see figure 16 in the Forested Vegetation, Timber Resource, and Wildland Fire section of the DEIS) which indicates that the early seral stage is close to the low range of HRV and that the late successional stage of cold forest is above HRV for multi-storied stands. This coupled with the fact that there is little active timber harvest anticipated in the cold forest under any alternative (see table 341 in the DEIS), should result in the maintenance of lynx habitat throughout the life of the plan.

Threats

Witmer et al. (1998) indicated that road density in lynx habitat should be 1 mile per square mile and currently more than half of the cold forest within the planning area is in areas that are roadless. However, since the planning area is considered unoccupied by resident lynx (USFS 2006) none of the alternatives pose a risk to individual Canada lynx.

Determination of Effects

Implementation of any of the alternatives would result in a no effect to the Canada lynx because:

1. The Canada lynx is not present in the analysis area;
2. The analysis area is not within critical habitat and
3. Habitat within the analysis area is not considered habitat essential to the conservation of this species (USDI 2005).
4. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Greater Sage Grouse (Proposed, Forest Service Sensitive)

Life History and Habitat Description

Sage-grouse are considered a sagebrush obligate species as virtually all studies of sage-grouse have identified the bird's dependence on large, woody sagebrushes (*Artemisia* spp.) for food and cover during all periods of the year (Connelly et al. 2004; Connelly et al. 2000; Dalke et al. 1963). According to Schroeder et al. (1999) sage-grouse use a wide mosaic of sagebrush habitats throughout the west including (1) tall sagebrush types such as big sagebrush (*Artemisia tridentata*), three-tip sagebrush (*A. tripartita*), and silver sagebrush (*A. cana*); (2) low sagebrush types, such as low sagebrush (*A. arbuscula*) and lack sagebrush (*A. nova*); (3) mixes of low and tall sagebrush with abundant forbs; (4) riparian and wet meadows; (5) steppe dominated by native forbs and bunchgrasses; (6) scrub-willow (Salix spp.); and (7) sagebrush/woodland mixes with juniper (*Juniperus* spp.), ponderosa pine (*Pinus ponderosa*), or quaking aspen (*Populus tremuloides*). Call and Maser (1985) summarized characteristics of quality sage-grouse habitat in Oregon as sagebrush steppe between 4,000 and 8,000 feet with annual precipitation of 10 to 16 inches and rolling topography. Within this landscape, sage-grouse need key habitat elements for reproduction and survival.

Sage-grouse exhibit strong site fidelity (loyalty to a particular area even when the area is no longer of value) to seasonal habitats, which includes breeding, nesting, brood rearing, and wintering areas (Connelly et al. 2004). Adult sage-grouse rarely switch between these habitats once they have been selected, limiting their adaptability to changes. During the spring breeding season, male sage-grouse gather together to perform courtship displays on areas called leks (strutting grounds) which are typically

used year after year. Areas of bare soil, shortgrass steppe, windswept ridges, exposed knolls, or other relatively open sites typically serve as leks (Patterson 1952, p. 83; Connelly et al. 2004, p. 3-7 and references therein). Leks are often surrounded by denser shrub-steppe cover, which is used for escape, thermal, and feeding cover. Breeding habitats typically are sage-brush dominated shrub-steppe, usually consisting of large, relatively contiguous stands of sage-brush (Connelly et al. 2011). Much of the original sage-grouse habitat has been permanently lost to agricultural development and urban areas (Leu and Hanser 2011; Pyke 2011) and the remaining habitat ranges from high quality to no longer adequate. In Oregon, nesting habitat consists of sagebrush plants (*A. tridentata* and *A. arbuscula*) with a strong native herbaceous understory (Hagen et al. 2007).

In March 2010, the USFWS determined that the greater sage-grouse warrants the protection of the Endangered Species Act but that listing the species at this time is precluded by the need to address higher priority species first (USFWS 2010). The U.S. Geological Survey published the Baseline Environmental Report (Manier et al. 2013) that summarizes the science, activities, programs and policies rangewide for the greater sage-grouse. It was done in cooperation with the Bureau of Land Management with the intent to "inform and advance large-area regional conservation efforts by consolidating information regarding rangewide and regional information about sage-grouse populations and habitats and to act as a bridge between these large-area efforts and regional and local management efforts (that is, forest and range management plans) by providing spatial and information context". The report utilizes the habitat designations of the BLM, "Preliminary Primary Habitat" (PPH) and "Preliminary General Habitat" (PGH) and emphasizes that it "should complement, not replace, locally specified priorities where these are aligned with regional issues (Conservation Objectives Team and others 2013)."

The U.S. Fish and Wildlife Service Conservation Objective Team (COT) identified key habitats necessary for sage-grouse conservation range-wide and called them "Priority Areas for Conservation" (PACs). These PACs were developed using maps created by individual states and therefore the PACs in their report coincide with the core areas identified by Oregon (Hagen 2011) and displayed in figure Sage-1. The BLM's National Technical Team identified Priority Primary Habitat (BLM 2011) which is the same as core areas and PACs in Oregon.

To facilitate management, COT (2013) divided the range of the sage-grouse into five management zones. The Blue Mountains National Forests fall into two different management zones, the Snake River Plains and the Northern Great Basin (COT 2013). According to COT (2013), the Malheur National Forest would encompass both management zones and two populations: the central Oregon population, which is considered at risk (C2) or potentially at risk (C3), and the northern great basin population, which is potentially at risk (C3). The Wallowa-Whitman is only in one management zone and encompasses only the Baker population which is considered at risk (C2).

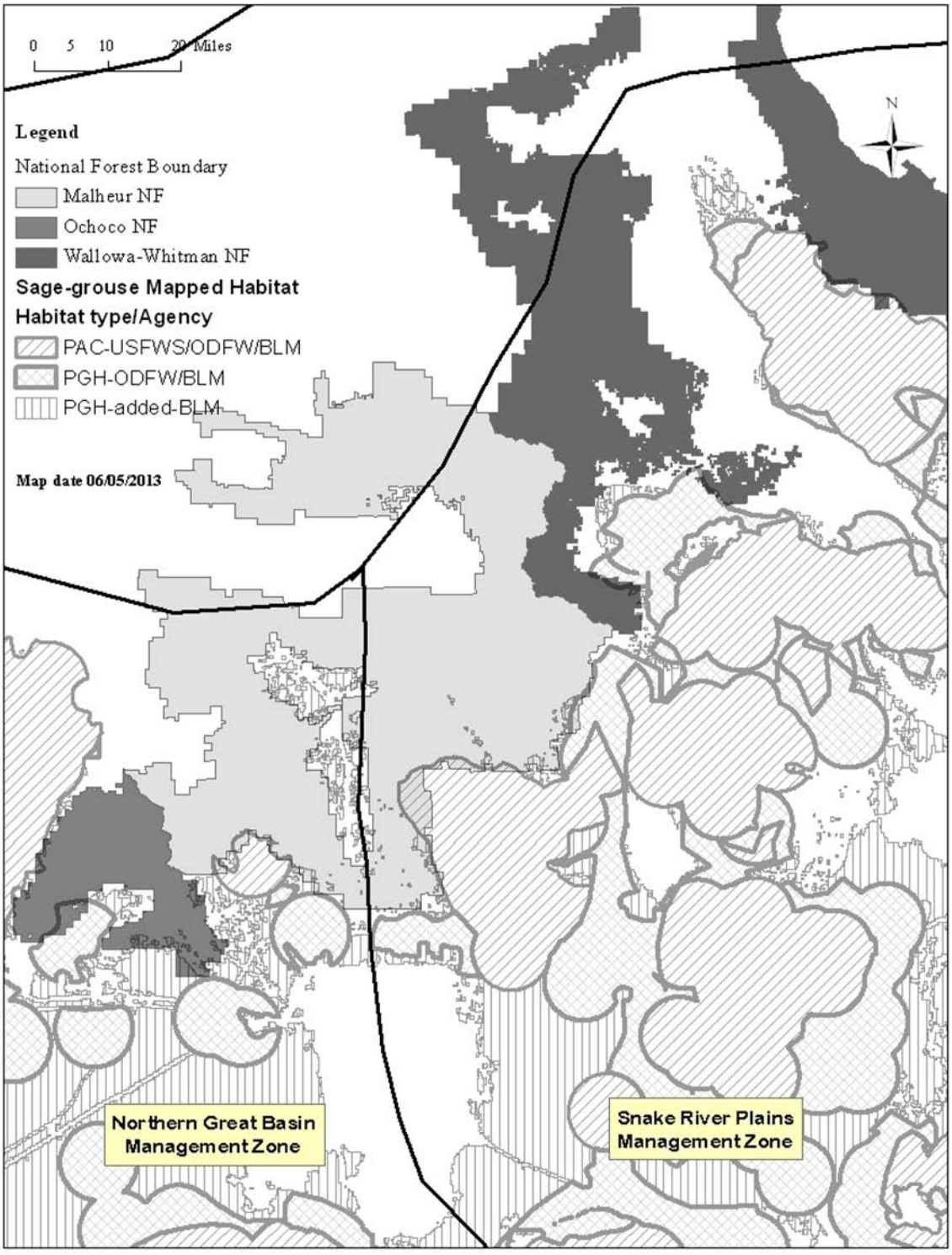
Sagebrush habitat was never highly abundant on Forest Service lands in the Blue Mountains. Within the analysis area sagebrush shrubland species vary by elevation and soils but include low sagebrush, silver sagebrush, rigid sagebrush, basin big sagebrush, Wyoming big sagebrush, mountain big sagebrush, threetip sagebrush, bitterbrush, and rabbitbrush (Johnson and Clausnitzer 1992). Hagen (2011) indicated that sage-grouse habitat is found on less that 7/10 of one percent of Forest Service lands in Oregon. For context, within the Northern Great Basin MZ, National Forest Service lands represent only one percent of PAC/PPH habitat and only $1/10^{th}$ of one percent is found on the Malheur National Forest (the Wallowa-Whitman does not occur within the management zone). Two percent of PGH habitat in this management zone is found on NFS lands with only ½ of one percent being found on the Malheur. Within the Snake River Plain management zone, Forest Service lands represent 7 percent of PAC/PPH habitat and 10% of PGH habitat. One tenth of one percent of PAC/PPH and PPG occurs on the Malheur, whereas the Wallowa-Whitman represents 1/100 of a percent of PAC/PPH habitat and 3/100 of a percent of PGH habitat.

Sagebrush steppe is identified as a special habitat in the forest plan, with a desire of no net loss and at least 70 percent with an understory of native species, resulting in conditions that are sustainable and resilient to disturbance, meaning that they are capable of recovering to their potential community without intervention after a disturbance. The other 30 percent of the landscape would include areas of juniper encroachment, non-sagebrush shrub lands, annual grasslands, and non-native perennial grasslands that potentially could be re-habilitated and enhanced as sagebrush habitat. This would be true no matter which action alternative is being evaluated.

Threats

Sage-grouse populations in these two management zones face a wide suite of threats, including juniper encroachment, renewable energy development (both wind and geothermal), energy transmission, roads, OHV recreation, mining development, and residential development. Despite efforts to manage wildfire risks, wildfires and invasive species have continued to reduce the quality of habitat in portions of this area (COT 2013).

FIGURE SAGE- 1: SAGE GROUSE HABITAT WITHIN THE NATIONAL FOREST BOUNDARY AS IDENTIFIED BY OREGON DEPARTMENT OF FISH AND WILDLIFE (HAGEN 2011).



Livestock grazing is the most wide-spread use of sage-grouse habitats in the west. There is no doubt that historical grazing had significant impacts on sagebrush habitats throughout the west (Crawford et al. 2004) due to season long use and stocking levels that far exceeded the carrying capacity of the land.

Current livestock grazing however can be positive, negative or neutral and will vary with timing, intensity of use and a host of environmental factors (Hagen 2011). Grazing may improve brood use of habitat (Dahlgren et al. 2006) or reduce nesting success due to loss of vegetation for cover (Beck and Mitchell 2000; Connelly and Braun 1997) or remain neutral by maintaining perennial bunch grasses with moderate levels of livestock utilization (Stohlgren et al. 1999). Beck and Mitchell (2000) summarized potential effects of livestock grazing on sage-grouse habitats, and cited only four references that provide empirical evidence of direct negative effects of livestock grazing on sage-grouse, as follow: Of 161 nests examined in Utah, two were trampled by livestock (one sheep, one cattle) and five were deserted due to disturbance by livestock (Rasmussen and Griner 1938). As previously discussed, data for both uplands and riparian areas indicate an improvement in overall rangeland condition, however it is recognized that many of the true rangeland sites are highly departed from their historic condition, however the causal agent may not have been livestock grazing.

Open-route density was also identified as a risk factor for the sagebrush group (Wales et al. 2011). Ingelfinger and Anderson (2004) found density of sagebrush obligate birds to decrease 39 to 60 percent within a 100-m buffer of roads with low traffic volumes associated with natural gas extraction in Wyoming. Although the direct effects of recreational activity on sage-grouse is unknown, there are negative correlations between sage-grouse populations and increased human activity (Connelly et al. 2004). Wales et al (2011) found road density to generally be low in source habitat for this group on NFS lands which is probably true for sage-grouse habitat as well. Neither road density nor distances to nearest roads were significant factors in the long term persistence of sage-grouse throughout its range (Aldridge et al. 2008), however negative effects to habitat use and productivity may occur locally from roads (Aldridge and Boyce 2007; Lyon and Anderson 2003), such as abandonment of leks during the breeding season.

Fire, both managed and unmanaged is considered one of the key threats to sage-grouse habitats (Crawford et al. 2004). As with grazing, fire can be positive, negative or neutral in its effects on sage-grouse. The length of the fire cycle has changed, being more frequent in low elevations and less frequent at higher elevations resulting in invasion of exotic grasses at lower elevations and woodland expansion at higher elevations (Miller et al. 2011).

Energy development on the landscape has been identified as a significant threat within the range of this species (Doherty et al. 2011). This has mostly been associated with oil and gas exploration, but more recently wind farms have become a concern.

Manier et al. (2013) calculated the direct and relative influence of identified threats to sage-grouse within each of the management zones that have been identified nationwide. Table Sage-1 lists the relative influence calculated by them for each threat according to the type of habitat, PPH (same as PAC) or PGH, within the Snake River and Northern Great Basin Management Zones (MZ). It provides the influence on all National Forest Service lands within each MZ not just the Blue Mountain Forests.

Determination of Effects

Umatilla National Forest

The greater sage-grouse is not expected to occur within the Umatilla National Forest (see Table 1). Sagebrush habitats were estimated to occur on less than 1 percent of the Forest, none of which were mapped as greater sage-grouse habitat by Hagen (2011). Because the forest is not occupied and there is no known occupied habitat in either Oregon (Hagen 2011) or Washington (Hays et al. 1998) immediately adjacent to the forest, there will be **No Impact** to the greater sage-grouse under any alternative and will not be addressed further for the Umatilla National Forest.

Table Sage-1: Summary of the relative influence* (percentage) for indirect effects of threats to sage-grouse habitat on Forest Service Lands from

BER (Manier et al. 2013) report																
Management Zone/Habitat	**Agricultural Lands**	**Urban Areas**	**Roads**	**Railroads**	**Power Transmission Lines (>115 kilovolt)**	**non-wind vertical structures**	**Fences (miles per square mile)**	**Energy Development (other than wind)**	**Wind turbines**	**Coal Mining**	**Mining/Mineral Source**	**2000-2012 fires**	**High fire probability predicted**	**Moderate/high probability of cheatgrass**	**conifer encroachment**	**Land Health Standards- grazing**	**Wild Horse/Burro Territories**
MZ IV- Snake River Plain																	
Preliminary Priority Habitats	**8%**	**8%**	**7%**	**5%**	**5%**	**7%**	**1.11**	**0%**	**0%**	**0%**	**10%**	**4%**	**6%**	**2%**	**15%**	**Not given for FS lands**	**0%**
Preliminary General Habitats	**10%**	**4%**	**10%**	**1%**	**7%**	**8%**	**1.09**	**0%**	**0%**	**0%**	**13%**	**10%**	**7%**	**2%**	**25%**		**0%**
MZ V- Northern Great Basin																	
Preliminary Priority Habitats	**1%**	**0%**	**1%**	**0%**	**1%**	**1%**	**1.03**	**0%**	**0%**	**0%**	**0%**	**0%**	**1%**	**1%**	**1%**		**0%**
Preliminary General Habitats	**2%**	**2%**	**2%**	**0%**	**2%**	**4%**	**1.11**	**0%**	**0%**	**0%**	**0%**	**4%**	**1%**	**1%**	**5%**		**0%**

***Relative influence was calculated as the percent of the particular sage-grouse habitat type influenced by the indirect impact of the threat (6.9 km indirect influence)**

Malheur National Forest

Greater sage-grouse are known to have occurred on the Malheur National Forest in the early 1990s. One historic lek was recorded in Bear Valley on private land adjacent to the Forest. Sagebrush steppe habitat was estimated to occur on approximately 6% of the landscape on the Malheur National Forest, however the habitat mapping completed by ODFW (Figure SAGE-1) indicates that only 41,600 acres is considered greater sage-grouse habitat. Of this 30,000 has been mapped as Priority Areas for Conservation (PAC), and the remainder as Low Density habitat or Preliminary General Habitat (PGH). Habitat on NFS lands is not contiguous, with the largest block within the Malheur National Forest being slightly more than 24,000 acres of Core Area Habitat (PAC) occurring in the Snake River Plains Management Zone and associated with the Northern Great Basin population. The Northern Great Basin population is a large population in Oregon, Idaho, Nevada, and Utah. In Oregon, PACs and low density (non-priority but managed) habitat combined capture all but three percent of known summer, one percent of known breeding, and one percent of known wintering habitat. Oregon PACs also considered the need to maintain a network of connected habitats. Overall, this part of the population is potentially at risk (C3). Habitat within the Malheur National Forest represents 0.6 percent of sage-grouse habitat in Oregon within this management zone.

The eastern portion of the Malheur is in the Northern Great Basin Management Zone and is associated with the Central Oregon population. This population is estimated to have only 53 percent of historical sagebrush habitat, having lost more historical habitat than any other sage-grouse administrative unit in Oregon. The area also has more privately owned sage-grouse habitat (48 percent) than most other sage-grouse management zone populations in Oregon. Priority areas for conservation and low density (non-priority but managed) habitat combined capture all but three percent of known summer, one percent of known breeding, and one percent of known wintering habitat. Although a lot of the known habitat is mapped, it is recommended to retain all PACs in Central Oregon. Less than 14,000 acres of habitat occur within the Malheur National Forest and less than half of this is considered PACs. This represents 0.2 percent of sage-grouse habitat within this management zone in Oregon.

All alternatives include a desired condition to restore habitats including the sagebrush steppe. Sagebrush steppe is identified as a special habitat for all alternatives (see appendix A 1.13 Special Habitats of the DEIS), with a desire of no net loss and at least 70 percent having an understory of native species, resulting in conditions that are sustainable and resilient to disturbance. In other words they are capable of recovering to their potential community without intervention after a disturbance. The other 30 percent of the landscape would include areas of juniper encroachment, non-sagebrush shrub lands, annual grasslands, and non-native perennial grasslands that potentially could be re-habilitated and enhanced as sagebrush habitat. This would be true no matter which action alternative is being evaluated.

It is assumed that livestock grazing would be managed to achieve the expressed desired conditions of the plan (see DEIS appendix A 1.2 Species Diversity, 1.5 Invasive Species, 1.6 Structural Stages, 1.7 Plant Species Composition, 1.8 Stand Density, and 1.13 Special Habitats), which would result in an improvement of rangeland phases. Alternative C reduces the amount of the Malheur National Forest considered suitable for livestock grazing by almost 28 percent, however suitable areas includes approximately 400 acres of sage-grouse PAC habitat and 700 acres of PGH habitat. Stocking rates and the residual biomass or utilization levels has more to do with successful range improvement than anything else (Dietz 1975; Hart and Ashby 1998; Hart et al. 1993; Herbel 1974; Holechek 1988; Hughes 1990; Van Poollen and Lacey 1979). As displayed in table 313 of the DEIS, the current forage needs of domestic livestock and wild ungulates is below what has been cited as acceptable use and still see rangeland improvement (Holecheck 1988); however, it is also recognized that small areas of overuse can occur. Because of this, Alternative C, followed by E and F would have the lowest risk to sage-grouse based on utilization within the uplands (RNG-5 and RNG-6 G-47).

Disturbance near nesting areas is addressed in all alternatives with the standard WLD-HAB-6 S-1 which prohibits activities that would disturb nesting activity within 1,200 feet of these sites. Alternative E and F, however, improve upon this protection measure by restricting open motorized routes within 2 miles of a lek during the breeding season (WLD-HAB-16 *New*). In general, sage-grouse habitats are within MA 4 which has an open motorized route desire of 2.4 miles per square mile or less for all Alternatives except E and F. It is assumed that by the time this plan is implemented, motorized travel will be limited to open designated routes with no cross-country travel allowed to comply with the 2005 Travel Management Rule.

All alternatives desire plant communities as well as disturbance regimes (i.e., fire) to be within HRV, which should preclude the use of fire as a management tool in the sagebrush community where the risk of exotic grass invasion is high. Alternatives E and F provide added management emphasis with standards and guidelines (FIRE-4 *New*; FIRE-5 *New*; WLD-HAB-22 *New*) to call attention this risk. Additionally there are standards that address the spread of noxious weeds (NOX-3) and that guide restoration (NOX-2).

RNG-5	**Guideline**

G-46	In areas classified as less than fully capable or suitable, only limited grazing should be authorized or allowed only after the limitations of the site are considered in designing the site-specific allotment management plan.
RNG-6 G-47	**Guideline** Shrub utilization should not exceed 45 percent. This should be based on mean annual vegetative production.

Although there is little indication that viable energy sources for development exist within the planning area, Alternatives E and F do have plan components (WLD-HAB-15 *New*; WLD-HAB-16 *New*; WLD-HAB-17 *New*) that would consider habitat adjacent to the Forest as well as on the Forest.

Based on this analysis it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Sage-grouse habitat on the Malheur National Forest represents 0.3 percent of habitat within Oregon and less than 1 percent of habitat in either of the Management Zones.
2. Currently there are no known active leks within or immediately adjacent to the Malheur National Forest.
3. The relative influence of the threats expected to occur on the Malheur are all less than 10%
4. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
5. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Wallowa-Whitman National Forest

Although the greater-sage grouse has been documented as occurring on the Wallowa-Whitman National Forest, the sagebrush steppe habitat was estimated to occur on less than 1% of the landscape for the Forest. According to ODFW (Figure SAGE-1) a little more than 3,000 acres of the Wallowa-Whitman would be considered sage-grouse habitat, most of which is mapped as Core habitat.

Habitat within the Wallowa-Whitman occurs in the Snake River Plains Management Zone and represents 0.07 of a percent of the habitat found in this management zone. And although this management zone supports the largest population of sage-grouse outside of the Wyoming Basin, habitat within the Wallowa-Whitman is only associated with the Baker population, which is thought to have little connectivity with other populations due to habitat and topography (COT 2013). Most (68 percent) of the sage-grouse habitat for the Baker population is in private ownership and 31 percent is administered by BLM (Hagen 2011). Overall, this population is considered at risk (C2) and most of the area used by this population is mapped as priority habitat of which less than one percent occurs within the Wallowa-Whitman.

The Baker population is more at risk and probably less resilient as connectivity to other populations appears limited. However, recent telemetry information suggests that at least some birds may move between the Weiser population in Idaho and the Baker population (COT 2013). There is no redundancy in this population as everything occurs in one general area. Also, the quality of habitat is more similar to habitat of extirpated populations than extant ones (Wisdom et al. 2011).

As discussed for the Malheur National Forest, all alternatives include a desired condition to restore habitats including the sagebrush steppe. Sagebrush steppe is identified as a special habitat for all alternatives, with a desire of no net loss. Management activities likely to occur in sage-grouse source

habitats are primarily grazing, invasive plant species control, and fire suppression, all of which were discussed in detail as threats/risks to habitat for the Malheur National Forest. All of the standards and guidelines discussed for the Malheur National Forest would also apply to the Wallowa-Whitman National Forest. Although less than 0.05 percent of sage-grouse habitat in Oregon occurs within the Wallowa-Whitman National Forest, overall management direction of any of the alternatives would contribute to habitat conditions for viability and persistence of this species even though individual sage-grouse may be impacted.

As with the Malheur, it is assumed that livestock grazing would be managed in a manner to achieve the expressed desired conditions of the plan. Although Alternative C reduces the amount of the land considered suitable for livestock grazing on the Wallowa-Whitman, all of the area considered greater-sage grouse habitat occurs within active grazing allotments. Still, the standard and guidelines for utilization within the uplands (RNG-5 and RNG-6 G-47) as discussed for the Malheur apply on the Wallowa-Whitman. This is also true for nest disturbance (WLD-HAB-6 S-1 and WLD-HAB-16 *New*); noxious weeds (NOX-2 and NOX-3); fire (FIRE-4 *New*; FIRE-5 *New*; WLD-HAB-22 *New*) and energy development (WLD-HAB-15 *New*; WLD-HAB-16 *New*; WLD-HAB-17 *New*).

Although neither the Malheur National Forest nor the Wallowa-Whitman National Forest constitutes significant amounts of greater sage-grouse habitat in Oregon (0.3 percent) and an individual sage-grouse may be impacted, overall management direction of any of the alternatives would contribute to habitat conditions that would maintain viability and persistence of this species.

Based on this analysis it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Sage-grouse habitat on the Wallowa-Whitman National Forest represents 0.004 percent of habitat within Oregon and less than 0.0013 percent of habitat in the Snake River Management Zone.
2. Currently there are no known active leks within or immediately adjacent to the Wallowa-Whitman National Forest.
3. The relative influence of the threats expected to occur on the Wallowa-Whitman are all less than 10%
4. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
5. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on Greater Sage Grouse

The vast majority of greater sage-grouse habitat in Oregon occurs on lands other than Forest Service lands. The bulk occurs on Bureau of Land Management (71 percent) and private lands (21 percent). Currently, BLM is reviewing their management with the intent of enhancing greater sage-grouse conservation on their lands. It is assumed that ODFW in cooperation with USFWS and NRCS will continue to provide incentives to private landowners for the conservation of sage-grouse habitat. Hunting will continue to be a cumulative impact, but at the current level is not considered to have an impact on the breeding population (Hagen 2011).

Climate change will have an important influence on sage-grouse habitats, as the various scenarios predict increasing temperature, atmospheric carbon dioxide, and severe weather events all of which favor

cheatgrass expansion and increased wildfire activity (Miller et al. 2011). Increase temperature predictions suggest that sagebrush habitats could be replaced with other woody vegetation causing further decline in sage-grouse habitats (Bradley 2010; North American Bird Conservation Initiative (NABCI) 2010).

Forest Service Sensitive Species

The alternatives analyzed in this document vary in the amount and type of management activities anticipated to be implemented during the life of the plan. All alternatives use the historical range of variability as the reference point for the desired outcomes of management. For example the desired condition for sensitive species is that the natural range of habitats for sensitive species is of adequate quality, distribution and abundance to contribute to the maintenance of species. This includes the ability of species and individuals to interact disperse and find security within the habitats of the planning area. It is expected that during project analysis and implementation that this desired condition would be used concurrently with information in the strategy and design criteria part of the plan and with consideration of the best available climate change projections.

Alpine/Boreal Family/Alpine Group

Black Rosy Finch and the Wallowa (Gray-crowned) Rosy Finch

The Gray-crowned rosy-finch was the focal species identified for this group. The subspecies that occurs in the Blue Mountains is the Wallowa rosy finch (Macdougall-Shackleton et al. 2000). Wisdom et al. (2000) placed both the gray-crowned and black rosy-finches (*Leucosticte atrata*) in same family and group. The species within this group are summer residents of high elevation alpine communities. The gray-crowned rosy finch does not have a special federal or state status. The gray-crowned rosy finch (and particularly the subspecies [*Leucosticte tephrocotis wallowa*] within the Wallowa Mountains) is a uniquely important component of species diversity within the Blue Mountains. It is one of two subspecies of birds considered to be endemic to Oregon (Marshall et al. 2003).

Life History and Habitat Description

Black rosy finches as well as the Wallowa rosy finch generally breed in open, rocky areas above timberline, usually near snow fields or glaciers, talus, rockpiles, and cliffs (Johnson 2002, Macdougall-Shackleton et al. 2000). Nests are often found in rocky crevices located on cliffs (French 1959). In the winter they tend to concentrate in flocks and migrate to lower elevation areas (Csuti et al. 2001). They will use a variety of winter roost sites (i.e. buildings, mine shafts and caves) (Marshall et al. 2003). Their diet consists mainly of insects and seeds (Johnson 1965). Breeding and nesting habitat occurs in alpine habitat associations throughout the plan revision area (Johnson 1975; Miller 1939; Wisdom et al. 2000). They forage along the edge of snow-fields for insects (Johnson 1965)

Source habitat is alpine tundra, barren rocky areas and cliffs (Wisdom et al, 2000). Currently only two isolated patches occur with the planning area. One patch is centered in the Eagle Cap Wilderness Area and the other in the Strawberry Wilderness Area. Though isolated from each other, as well as, other source habitat, they serve as stepping stones for movement of this focal species between the Rocky Mountains and the Cascades. The amount of source habitat has not changed from the historic situation to the existing condition (Wisdom et al, 2000). Hann et al. (1997) however, point out that while the overall trend is not changing, site specific instances of loss of habitat quality from past excessive domestic sheep grazing may have already occurred.

Due to the limited distribution of these species within the planning area, and its unique habitat, a Focal Species assessment model was not developed to evaluate viability.

Threats

According to Lehmkuhl et al. (1997) current risks to this species would be overgrazing by domestic sheep and human recreational activities in alpine tundra. Macdougall-Shackleton et al. (2000) however state that on breeding grounds, foraging birds can be approached to within 1–2 m. and given the remoteness of breeding sites there is almost no impact of human activity on breeding grounds.

Determination of Effects

The gray-crowned rosy-finch was identified as a focal species in the R6 Terrestrial Species Assessment (USDA 2010), but due to their limited distribution and unique habitat within the planning area, a focal species assessment model was not developed. The amount of habitat subjected to domestic sheep grazing varies by Forest (Table 23), from zero on the Wallowa-Whitman to 15 percent on the Malheur. This estimate of source habitat is all Cold Herbland (UH) PVG found within the range of the species as given by Marcot et al. (2003). As indicated in Table 1, the Wallowa-Whitman National Forest is known to be occupied by the Wallowa rosy finch (subspecies of gray-crowned rosy finch) and black rosy finch is suspected to occur. Only the Wallowa rosy finch (subspecies of gray-crowned rosy finch) is suspected as occurring on the Malheur (Table 1). Neither species is documented or suspected to occur on the Umatilla National Forest.

Table TW23: Estimated acres of gray-crowned rosy-finch source habitat by Forest and the percent in active grazing allotments, subject to domestic sheep grazing and within designated wilderness.

National Forest	Acres of Source Habitat	Active Allotment	Domestic sheep grazing	Designated Wilderness
Malheur	1,500	38%	15%	66%
Umatilla	3,900	13%	8%	45%
Wallowa-Whitman	39,000	38%	0%	53%
Blue Mountains	44,000	36%	1%	53%

Only Alternative C reduces the amount of source habitat that is subject to domestic sheep grazing; zero on the Malheur and just slightly over one percent on both the Wallowa-Whitman and the Umatilla National Forests. Although alternatives A, B, E, and F have the same amount of source habitat within active allotments, alternatives E and F should have the least impact due to a lower utilization level, followed by alternative A (see table A-8, Appendix A in the DEIS) and then alternative B (see livestock grazing discussion under Focal Species in the DEIS). All alternatives have the following desired conditions (which are plan components) that should guide management activities including grazing:

> The mix of plant species across the landscape creates conditions that are resilient, sustainable, and compatible with maintaining disturbance processes at desired levels. [Herbland environments are classified into phases based on species composition. Phases A and B are least departed from HRV and D is the most departed]. The desired condition for herblands is that only 10-30 percent be in phase C, 0 in phase D and the majority in phase A or B. The desired conditions for herblands should be applied at the project scale (minimum of 1,000 acres).

Although there are slight differences in the overall amount of backcountry between alternatives, the increase in the amount of source habitat included in backcountry areas would be negligible. Most of the habitat for the rosy-finches (alpine) is not within management areas that have open motor vehicle use and therefore the difference in access (open motor vehicle routes) between alternatives would probably not alter the amount of recreation occurring in their habitat. For example, only 16 percent of potential rosy-finch habitat under alternative D occurs within MA 4 on the Malheur. On the Wallowa-Whitman 32 percent of potential habitat in alternative D occurs in MA 4, but 0 percent of occupied habitat occurs within MA 4.

Remoteness of breeding habitat makes it unlikely that human activity will adversely influence populations in the near future. Johnson (2003) states that although largely speculative, it is assumed that since adults tolerate visits to nests by researchers, they are probably undisturbed by recreational activity (hiking, rock climbing, early-summer skiing and snowboarding). Such activities however, could result in increased nest predation by common ravens if they are drawn to alpine areas by discarded human food and trash (Martin 2001). Mining could destroy (by blasting) or create (abandoned or little-used buildings) nest sites. Grazing could have negative impacts if it reduced food supply or drew Brown-headed Cowbirds (*Molothrus ater*) to alpine habitat.

The black rosy finch is considered apparently secure (NatureServe 2012) both globally (G4) and Nationally (N4). The breeding population in Oregon is considered imperiled (S2B). The gray-crowned rosy finch is considered secure both globally (G5) and Nationally (N5) and vulnerable (S3B) in Oregon however the Wallowa subspecies is considered imperiled (S2B). According to NatureServe (2012) nominal subspecies of *L. tephrocotis* generally have not been recognized in recent literature which is supported by the recent DNA work of Drovetski et al. (2009) that suggests there is only one species of rosy-finch in North America. If this is true then the breeding population of this species would be found in Oregon, Washington, Montana, Idaho, California and Alaska. Local expertise however feels that the subspecies of rosy finch in the Wallowa Mountains should continue to be recognized, especially given the effects of climate change and the threats to their high elevation habitats (Carol Hughes, pers. Comm.)

Malheur National Forest

Only the Wallowa rosy finch is suspected to occur on the Malheur National Forest (Table 1) and therefore there is **No Impact** to the **black rosy-finch** under any alternative. None of the alternatives promote increased recreational activity in rosy-finch habitat. Although some cold herbland is found in MA 4, the habitat identified for rosy-finches on the Malheur is found entirely within the wilderness. This is also true regarding grazing; the habitat within the Strawberry wilderness is not within an active grazing allotment even under alternative D.

Based on this analysis it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Wallowa rosy finch habitat is extremely limited on the Malheur National Forest and it is almost entirely within back country management area designations.
2. Less than 15% of the potential habitat for the rosy finch is subject to domestic sheep grazing.
3. It is unclear if the species is found on the Malheur that it would indeed be the sub-species of concern
4. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
5. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Umatilla National Forest

Neither the black-crowned rosy finch nor the Wallowa rosy-finch are known or suspected to occur on the Umatilla National Forest (Table 1). Therefore implementation of any of the alternatives would result in **No Impact** to either species.

Wallowa-Whitman National Forest

The Wallowa rosy-finch is documented and the black rosy-finch is suspected in alpine areas within the Eagle Cap Wilderness area (Table 1). None of the alternatives promote increased recreational activity in rosy-finch habitat. Although some cold herbland is found in MA 4, the habitat identified for rosy-finches on the Wallowa-Whitman is found entirely within the wilderness. Although 38 percent of the habitat is within active grazing allotments none is within domestic sheep allotments. Even for the habitat subjected to grazing, it should manage to achieve the desired conditions of the plan.

Based on this analysis it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Wallowa rosy finch habitat is extremely limited on the Wallowa-Whitman National Forest and all occupied habitat is within back country management area designations.
2. None of the potential habitat for the rosy finch is subject to domestic sheep grazing.
3. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
4. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

The gray-crowned rosy-finch is a migratory species. It tends to spend the summer in high elevation alpine areas (mainly on national forest lands) and winters in adjacent valley areas located off the national forests. None of the national forests within the plan revision support the entire amount of source habitat necessary for this species to be sustainable. However, the nesting and brood rearing habitat located on national forest lands is an essential component for this species sustainability. A compounding factor is the potential impact of climate change (Boucher and Diamond 2001; Brown et al. 1999; Buskirk et al. 2009; Cotton 2003). Jones and Cresswell (2009) state that, "The phenology mismatch hypothesis predicts that migrant birds, which experience a greater rate of warming in their breeding grounds compared to their wintering grounds, are more likely to be in decline, because their migration will occur later and they may then miss the early stages of the breeding season. Population trends will also be negatively correlated with distance, because the chances of phenology mismatch increase with number of staging sites."

Wormworth and Mallon (2006) suggest that projected changes in vegetation shifts caused by climate change could affect bird species. They project that alpine vegetation communities within the arctic would likely be reduced. Romme and Turner (1991) make similar predictions for the Greater Yellowstone ecosystem, resulting in fragmentation and loss of habitat. Although there is a high degree of uncertainty, this same projected change would likely occur within the Blue Mountains.

Recent research has also indicated that introduced trout in high elevation lakes may be impacting these species. When mayflies are available, they may comprise as much as 38% of the Rosy-Finch diet and with the widespread introduction of trout to the historically fishless lakes has undoubtedly resulted in reduced mayfly prey availability (Epanchin et al. 2010).

Forest Mosaic Family/All Forest Communities Group

The forest mosaic family refers to species that need to have a mosaic of forest conditions across the landscape. Alternatives B through D have the following desired conditions that will achieve this condition, which are plan components that would direct the design of projects-

Structural Stages- The distribution and abundance of forested structural stages creates conditions that are resilient, sustainable, and compatible with maintaining disturbance processes. The ranges given (which are based on HRV) allow for variations in the mix of structural stages/PVG combinations across the landscape to respond to potential changes in climate.

Plant Species Composition- The mix of species across the landscape creates conditions that are resilient, sustainable, and compatible with maintaining disturbance processes at desired levels based on HRV. The desired condition ranges for forested species composition within each PVG allow for variations in the mix of species/PVG combinations across the landscape to respond to potential changes in climate.

Stand Density- The range of vegetation density across the landscape creates conditions that are resilient and sustainable based on HRV. The desired condition ranges for the percent of the forested landscape within each of the density classes allow for variations in the mix of vegetation density/PVG combinations across the landscape to respond to potential changes in climate.

Great Gray Owl (Washington only)

Life History and Habitat Description

The great gray owl uses a variety of habitats, primarily mature forests interspersed with open areas suitable for foraging (Duncan and Hayward 1994). Older and mature forests with high canopy closure, adjacent to open areas suitable for foraging, are preferred for nesting, although second-growth forests are sometimes used (Bryan and Forsman 1987; Bull and Henjum 1990; Duncan et al. 1997; van Riper iii and van Wagtendonk 2006). Its preferred foraging habitat includes montane meadows and open forests. Bogs, clearcuts, and early successional forests are also used for foraging (Bryan and Forsman 1987; Franklin 1988).

Great gray owls feed primarily on small mammals. In the western United States great gray owls prey primarily on voles (*Microtus* spp.) and pocket gophers (*Thomomys* spp.) (Bull and Duncan 1993; Bull and Henjum 1990; Franklin 1988). Pocket gophers appear to be an important prey in the southern portion of their range (Franklin 1988). However, even when pocket gophers are abundant, it appears that great gray owls may not breed in the absence of voles, which may be due to the difficulty of catching pocket gophers (Williams 2012). Prey availability is considered the most important factor limiting population growth. Many species of owls are food limited and adequate foraging habitat is critical in maintaining populations (Korpimaki 1984). Habitat availability and quality, especially the availability of nest sites, are also important limiting factors (Duncan and Hayward 1994).

Large broken-top snags, stumps, trees with large mistletoe clumps (*Arceuthobium* spp.), artificial nest platforms, and abandoned raptor and corvid stick nests are used for nesting (Bull and Duncan 1993; Sears 2006). Nests are typically located within .3 km of a meadow or other opening (Bryan and Forsman 1987). In southwestern Oregon, 61 of 63 nest sites were located in forests adjacent to meadows, and all nest sites were in old growth or mature stands (Bryan and Forsman 1987).

Great gray owls are relatively long lived and have a low reproductive rate. Great gray owls usually produce one brood per year, although they are known to re-nest if the first nest fails (Bull and Henjum 1990). Some pairs may not breed in years of low prey abundance. Great gray owls typically nest in the

same home range year after year (Bull et al. 1988). They demonstrate strong fidelity to breeding and wintering areas (Bull et al. 1988), but less to specific nest sites. They will, however, often reuse nests, and a pair will sometimes return to the same nest site year after year (Franklin 1988; Bull et al. 1988). In northeastern Oregon, seven of 18 nest sites were re-used (Bull et al. 1988), while in a study in southwestern Oregon; none of 10 nests were re-occupied in subsequent years (Williams 2012).

Threats

According to NatureServe (2012) in addition to the provision of suitable habitat, management needs include protection of nesting areas from excessive human activity during the nesting season.

Gopher control practices such as strychnine poisoning that are sometimes used to encourage regeneration in clearcuts may offset the increase in local mammal populations (Williams 2012). It is unknown whether Great Gray Owls are indirectly poisoned through gopher control practices (Duncan and Hayward 1994).

High-severity or stand replacing fires can remove snags and large-diameter trees, as well as vacated raptor nests and dwarf mistletoe brooms, used for nesting and foraging (Bull and Henjum 1990; Franklin 1988; Whitfield and Gaffney 1997).

The encroachment of conifers into meadows resulting from fire suppression and climate change has likely reduced foraging habitat quality and availability for Great Gray Owls in Oregon and Washington (Williams 2012).

Large tree and snag removal could reduce the suitability of habitat for great gray owls (Bull and Duncan 1993).

Determination of Effects

In Oregon, great gray owl populations appear to be relatively secure, with strong breeding populations in southwestern Oregon, and in the Blue and Wallowa Mountains and surrounding areas of northeastern Oregon (Williams 2012). Although considered secure in the Blue Mountains of Oregon, a portion of this mountain range on the Umatilla National Forest extends into southeast Washington (representing 1 percent of the state- WDFW 2005) where the great gray owl is considered sensitive at the state level. The great gray owl has been documented as occurring on that portion of the Umatilla NF in Washington (Table 1). It has only been since 1991 that breeding in Washington has been documented, when as many as four possible nesting areas were discovered (NatureMapping Foundation 2012). Great gray owls are listed as a priority 3 species (species vulnerable or declining) in Washington but it is not listed as occurring in the Blue Mountain Eco region (WDNR 2009). Although figure GROW1 does not indicate breeding in the Blue Mountains, according to NatureMapping (2012) due to the substantial population known from Oregon's Wallowa Mountains and in the southern Blue Mountains in Oregon, this species may also occur as a breeder in the Blue Mountains of Washington.

The large home range, movements, and dispersal distances of great gray owls suggest that a landscape scale approach to management is appropriate (Bryan and Forsman 1987; Duncan 1997). Duncan (1997) proposes that management provide a mix of suitable nesting and foraging habitat across a large area. Forest management such as proposed by all of the alternatives encourage a range of successional stages, from early- to mid- to late-seral forests, across the landscape that would mimic the historical condition. This should provide such a mix of suitable habitats.

Umatilla National Forest

The great gray owl is in the Forest Mosaic/All Forest Communities family and group, which is represented by the focal species northern goshawk (see Wales et al. 2011). Similar to goshawks, the great gray owl is associated with larger tree forests for nesting and forest openings for foraging. Source habitat

for the goshawk was identified as forests with >15" DBH and closed canopies. The risk and habitat quality factors were the abundance of forests with trees >20" and closed canopy as well as habitat effectiveness. Primarily as a result of an abundance of source habitat in many areas above the median HRV, the viability of goshawks in the Blue Mountains was calculated to currently be an A outcome (Wales et al. 2011). This resulted in a low level of concern for the viability of the goshawk on the Umatilla National Forest.

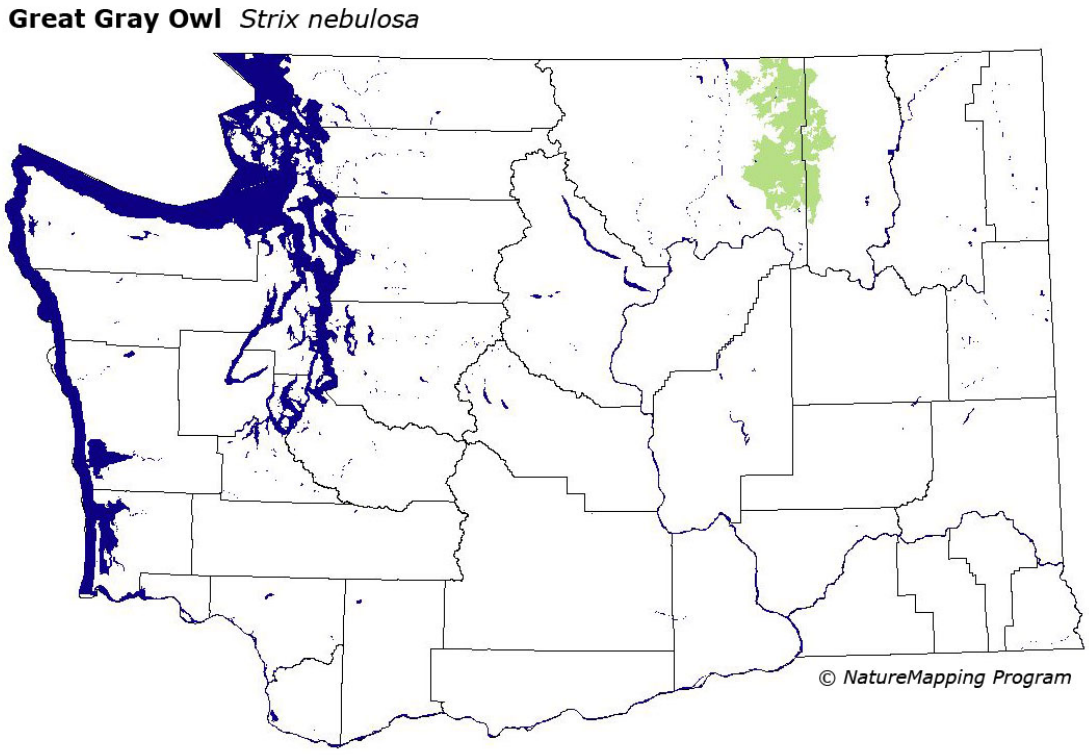


FIGURE GROW1- BREEDING RANGE OF THE GREAT GRAY OWL IN WASHINGTON BASED ON HABITATS IDENTIFIED USING 1991 SATELLITE IMAGERY, BREEDING BIRD ATLAS (BBA), OTHER DATASETS AND EXPERTS THROUGHOUT THE STATE, AS PART OF THE WASHINGTON GAP ANALYSIS PROJECT.

Habitat for the focal species, northern goshawk currently is 140 percent above HRV median. Habitat projections based on implementing the alternatives continue to increase above the HRV median through year 20 in all alternatives except D where it remains neutral (figure NOGO-1). The 50-year trend in habitat for all alternatives is declining but as can be seen from Figure NOGO-1, habitat in alt D is at the level that occurred historically and all other alternatives exceed what would have been expected historically. Even though habitat declines, because it remains within the historic range of variability it is assumed to be adequate to maintain viable populations (Landres et al. 1999) at the level of the Blue Mountains. Because this species is only considered sensitive in Washington it should be further stated that more than 65 percent of the Washington portion of the Blue Mountains is in management areas that are not actively managed (i.e., wilderness or roadless areas). Likely, as similar to the goshawk, the amount of source habitat for great gray owls will remain at or above the HRV median under all alternatives.

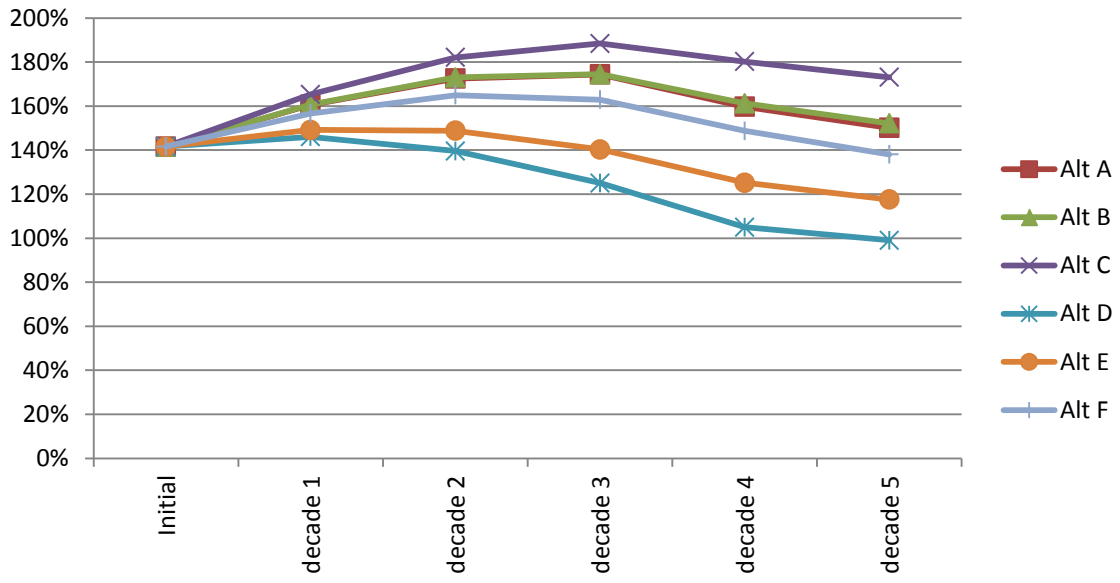
An additional habitat quality factor for these owls would be the presence of large snags and trees for nesting. Impacts to habitat effectiveness (availability of snags) associated with proximity to roads is likely

highest in Alt D. Habitat effectiveness should improve under alternative C the most as the risk associated with roads decreases. In all alternatives there are desired conditions for snag densities:

Snags and Down Wood- Snags and down wood occur within all of the PVGs and vegetation cover types (lodgepole) at levels similar to HRV. Snags and down wood persist across the landscape either singularly or in patches. Snags and down wood density will be highest following disturbance events, such as wildfire, wind events, and insects and disease outbreaks. Snags and down wood density will tend to be higher in riparian areas. Snags are the major source of down wood in both upland and riparian areas.

Alternatives B, C, E, and F have a standard protecting large (>=21" DBH) snags (WLD-HAB-12 S-7) and a guideline or standard that protects large old trees (OF-1 G-59). All action alternatives have a standard or guideline that also protects known nest trees (WLD-HAB-10 G-11) none of the alternatives propose the control of gophers in regeneration areas.

Figure NOGO-1: Percent of source habitat in relation to mid-point HRV by alternative for the northern goshawk over the first five decades on the Umatilla National Forest.



The protection of known nest sites is an important management consideration, and is especially important in areas where available nesting habitat could be a limiting factor (Huff 1996). It is also important to protect known nest sites from excessive human activity during the breeding season and all alternatives have a standard (WLD-HAB-6 S-1) that prohibits such disturbance within 1,200 feet of nest sites during the breeding season.

The breeding population of the great gray owl is considered imperiled (S2B) in Washington, but globally it is considered secure (G5) and nationally it is considered apparently secure (N4) (NatureServe 2012). In Oregon it is considered vulnerable (S3). The Blue Mountains of Washington represent less than one percent of great gray owl habitat in the State. Populations in the western U.S. appear more fragmented than northern populations, although this may be simply due to the fact that the species is at the edge of its range in the western U.S. (Williams 2012). There is no anticipated reduction in suitable nesting habitat within the analysis area under any of the alternatives.

The above analysis suggests that under any alternative it is likely that proposed management activities **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. National forest lands on the Umatilla National Forest represent less than 1 percent of potential breeding habitat for this owl in Washington.
2. Habitat is estimated to exceed historical levels under all alternatives based on the focal species assessment model for this family/group.
3. More than 65 percent of the Washington portion of the Blue Mountains is in management areas that are not actively managed (i.e., wilderness or roadless areas).
4. The great gray owl is considered apparently secure nation wide
5. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
6. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

According to the Washington Conservation Strategy (WDFW 2005) most of the Blue Mountains ecoregion is held and managed by federal and state agencies. The Umatilla National Forest covers over half (52%) of Washington's portion of the ecoregion, while land managed by the Bureau of Land Management makes up about nine percent. The Washington Department of Fish and Wildlife manages about 32,895 acres in the foothills and canyons of the Blue Mountains, including the William T. Wooten, Asotin, and Chief Joseph Wildlife Areas. Thirty-four percent of the ecoregion is private land. Aside from a few mining claims in the mountains, private land holdings are concentrated in the river valley bottoms, which contain the best soils and access to water and are not great gray owl habitat. The only large industrial landowners are timber companies. Although it is assumed that these lands will continue to be managed in a "production" mode (i.e., younger forests), Wisdom et al. (2000) found that source habitats for the great gray owl have increased in the Blue Mountains Ecological Reporting Unit (ERUs), primarily due to an increase in late-seral montane forests.

The encroachment of conifers into meadows resulting from fire suppression and climate change has likely reduced foraging habitat quality and availability for Great Gray Owls in Oregon and Washington. Extensive encroachment of conifers into meadows since the 1940's has been documented in both Oregon and Washington. The extent of encroachment is likely primarily due to fire suppression during this period, although historic grazing and climate change impacts have also likely played a role (Dailey 2008; Franklin et al. 1971; Takaoka and Swanson 2008).

Residential and commercial development has significantly reduced Great Gray Owl habitat in many portions of the species' range including central Oregon, California, and Manitoba (Bryan and Forsman 1987; Sears 2006). Recently, major changes have occurred in the composition of the rural population and land uses in the Blue Mountains and the region is being discovered as more and more town and city residents are seeking rural home sites (WDFW 2005).

Medium/Large Trees Family/Dry Forest Group

White-headed Woodpecker (Regional Forester's Sensitive Species)

Life History and Habitat Description

The white-headed woodpecker is associated with open-canopied ponderosa pine forests (Bull et al. 1986; Frederick and Moore 1991; Garrett et al. 1996; Kozma 2011). White-headed woodpeckers forage predominantly on large-diameter live ponderosa pine trees (Dixon 1995a) with pine seeds being the most important vegetable food item in Oregon (Bull et al. 1986, Dixon 1995a). White-headed woodpeckers are primarily non-migratory (Marshall 2003) and rely on mature, cone-producing trees during winter (Garrett et al. 1996; Milne and Hejl 1989).

This species excavates its nest cavities in moderately decayed wood, usually in large-diameter snags (Raphael and White 1984, Milne and Hejl 1989, Dixon 1995, and Dixon 1995a). Frenzel (2002) found that of 405 nests of white-headed woodpeckers, all but 12 were in completely dead trees. Dixon (1995a, 1995) found population density increased with increasing volumes of old-growth ponderosa pine in both contiguous and fragmented sites. In addition, these woodpeckers may use areas which have undergone various silvicultural treatments, including post-fire areas, if large-diameter ponderosa pines and other old-growth components remain (Frenzel 2002; Raphael 1981; Raphael et al. 1987; Raphael and White 1984; Wightman et al. 2010). Average canopy closure at 55 nest sites studied by Frenzel (2002) was 13%.Understory vegetation is generally sparse within preferred habitat (Garrett et al 1996). Frenzel (2004) found that shrub cover was a significant variable in predicting nest success. Nest sites with <5% shrub cover had the highest mean nesting success of 61%. Nest success with shrub cover >5%, had a mean nest success of 42%.

For the period 1997-2004, Frenzel (2004) found nesting success was 39% at nest sites in silvicultural treatments or sites with low densities of big trees as opposed to 61% for nests in uncut stands. Uncut sites had big tree (> 21 inches [53 cm] DBH) density >=12 trees/ac (0.4/ha)).

Threats

Past, present, and ongoing habitat loss pose a threat to the continued existence of this species throughout its range (Wisdom et al 2000). Amounts of old-growth ponderosa pine remaining in Oregon is unknown, but are probably less than 10 percent of what occurred in pre-European settlement times (Marshall 1997). The loss has occurred mainly through a combination of timber harvest, road building, and wildfire.

Habitat quality has been reduced due to extensive loss of large ponderosa pine trees primarily from historic timber harvesting. They are dependent on large pine seeds as food during non-breeding season and almost all ponderosa pine seed production is by large, dominant trees in open situations (Oliver and Ryker 1990).

Fire suppression has allowed understory encroachment of firs and increased fuel loads which predispose these areas to stand-replacement fires and lack of recruitment of young ponderosa pine.

The loss of snags and down logs (foraging) from timber harvest and fuelwood cutting. Bate et al. (2007) and Wisdom and Bate (2008), found that snag numbers were lower adjacent to roads due to safety considerations, firewood cutters, and other management activities indicating that roads are an indirect threat to snag abundance.

Fragmented habitat increases energy expenditure and risk of predation to secure resources

Determination of Effect

A focal species assessment model was developed for white-headed woodpeckers and used to analyze habitat across each of the national forests (Wales et al. 2011). Source habitat for both current and historical conditions was considered to be the dry forest PVG with single and multi-stories, large-tree structure, > 20 inches DBH, and open canopies (i.e., < 40 percent).Other factors that were considered in the evaluation of habitat for this species included snag, open motor vehicle route density and shrub cover. The ability of white-headed woodpecker to disperse across the planning area was not considered an issue.

The viability outcome for the white-headed woodpecker historically was projected to be an A, while currently on all three national forests the viability outcome is projected to be an E. This results in a high level of concern for the viability of the white-headed woodpecker across all three forests (Table WH-1). The main factor leading to this level of concern is the historic loss of large, open canopied ponderosa pine habitat resulting in levels far below HRV for these habitats.

Mason and Countryman (2010) utilized CVS plot data to summarize snag conditions within the Blue Mountains. Bate et al. (2007) identified some of the short comings of using CVS data for snag analysis but concluded that, with the exception of human access variables such as distance to nearest town, the patterns of distribution were similar between CVS data and the more stratified data that they collected. They also identified a variety of risks that affected snag density which are discussed in more detail later in the document. Snag densities across the three national forests are similar to what would be expected historically (see tables 303, 304 and 305 in the DEIS). High densities of large diameter snags (80 percent tolerance level) in both the dry and moist PVGs are lower than what would be expected, which may be a relic of past harvest practices, as management during the past decade has emphasized the retention of large diameter snags. Although snag densities may be similar to historic levels, it is recognized that distribution across the landscape may be different than what was found historically (Nutt et al. 2010). Wales et al. (2011) demonstrated that in most cases, distribution within source habitat across watersheds within each of the national forests is not what would be expected.

Table WH-1: Level of viability concern by national forest for the white-headed woodpecker currently and projected for each alternative.

	Level of viability concern						
		Alternative					
National Forest	Current	A	B	C	D	E	F
Umatilla	H	H	H	H	H	H	H
Malheur	H	H	H	H	H	H	H
Wallowa-Whitman	H	H	H	H	H	H	H

All alternatives have the same desired condition for snags (section 1.14 Snags and Down Wood in the DEIS) and in the case of the dry PVG all alternatives except alternative D have a standard to retain snags greater than 21 inches DBH and 50 percent of snags between 12 and 21 inches (WLD-HAB-12 S7). Although this will help to maintain current snag levels, it is possible that future snag recruitment could be different between alternatives because of differing harvest levels. Friesen (2009) reviewed modeling efforts and literature to assess the impact on snag dynamics from thinning of forested stands. She found that thinning in young stands does promote the development of larger diameter green trees faster over time than in un-thinned stands. However, the reduced competition from the thinning and snag creation reduces density-dependent mortality in the residual trees, allowing them to be healthier and live longer before succumbing to competition, insects, or disease to become a snag (Davis et al. 2007; Garman et al. 2003; Harrington et al. 2005). Friesen (2009) noted that modeling this question results in different answers, depending on the model. Because traditional implementation of silvicultural systems will probably capture mortality and improve the health of the stand in general, it is assumed that snag

recruitment will take longer under those alternatives with more commercial treatment. Therefore although alternative D does the most to increase source habitat, it also will have the greatest impact on snag dynamics as it treats the most acres commercially (see tables 249, 259 and 251 in the Forested Vegetation, Timber Resources, and Wildland Fire section of the DEIS). However, at the landscape level areas of undisturbed forest are often skipped leaving habitat islands with diverse structural legacies and unique environmental conditions (Foster et al. 1998; Franklin et al. 2002; Friesen 2009). Less than 11 percent of the dry forest PVG would actually be treated commercially for alternative D (see table 310 in the DEIS) on any one national forest in the first decade. All other alternatives have standards and/or guidelines protecting large trees (OF-1 G-59), snags (WLD-HAB-13 S7) and trees with nest cavities (WLD-HAB-11 G-1). It would appear unlikely given the plan components that any alternative during the life of the plan would significantly reduce the potential for snag recruitment at the landscape level based on harvest.

White-headed woodpeckers are also associated with some post-fire habitats (Wightman et al. 2010). Alternative C maintains all important post-fire habitat components whereas alternatives B, E, and F limit salvaging large snags (>=21" dbh) in post fire habitats (WLD-HAB-22 G-6) as well as the area available for salvage harvesting (WLD-HAB-20 G-4, WLD-HAB-21 G-5).

Over a 50 year time frame there is an increase in habitat in all Alternatives across all three national forests, although it remains well below HRV. When the effects of these alternatives are combined with the residual and expected effects of past, present, and future activities in the analysis area, there would be an incremental improvement in habitat for the white-headed woodpecker resulting from old forest ponderosa pine restoration treatments within harvest units. The proposed activities under all alternatives would have a beneficial effect on white-headed woodpecker habitat in the short and long term. Potential habitat would be moved into a suitable habitat condition by all alternatives; the magnitude (number of acres) would vary by alternative. While there would also be a reduction in snags due to hazard and danger tree felling, the impact would be minor.

It is assumed that distribution of habitat will also improve as the amount of habitat increases. It is also assumed that the level of active management (i.e., timber harvest, fuel treatments, prescribed fire) increases the risk of a reduction in habitat attributes such as snags. Those alternatives with the highest amount of prescribed fire probably present the greatest risk to snags. Although it is commonly thought that prescribed fire will create snags, studies have indicated a greater loss of snags than recruitment (Randall-Parker and Miller 2002; Stephens and Moghaddas 2005; Tiedemann et al. 2000).

In white-headed woodpecker habitat, alternative D would have the least risk to snag loss from management activities within the Malheur National Forest as it anticipates no prescribed fire. This is probably the case for the Umatilla and Wallowa-Whitman National Forests as well. Both alternatives E and F would have the greatest risk to snags from all management activities for the Malheur and Umatilla National Forests. For the Wallowa-Whitman National Forest, alternative A would actually pose the greatest risk to snags because of the anticipated amount of prescribed fire followed by alternatives E and F respectively. In summary, alternative D most likely presents the least risk to snags from management actions on all three national forests, due to the lack of prescribed fire, which has far less certainty in its impacts on existing snags.

<u>Open motor vehicle routes (risk to snag density)</u>

Bate et al. (2007), found that the density of snags greater than 9 inches (23 cm) DBH were lower adjacent to roads and towns in the pine and larch forests of northeastern Oregon, presumably due to safety considerations, firewood cutters, and other management activities. Wisdom and Bate (2008) found similar results in western Montana. The snag density data utilized by Wales et al. (2011) came from a modeled data set that did not account for road associated factors. Therefore in addition to snag densities the focal species assessment model uses open motor vehicle route density as a variable to account for the probable

reduced snag densities along open motor vehicle routes. Watersheds were analyzed based on the amount of potential habitat in different open motor vehicle route densities:

- Zero: less than 0.1 miles per square mile
- Low: 0.1 to 1.0 miles per square mile
- Moderate: 1.1 to 2.0 miles per square mile
- High: greater than 2.0 miles per square mile

Open motor vehicle route density was maintained as a constant in the modeling of alternative B. In evaluating risk from other alternatives, it must kept in mind that a higher level of management activity does not necessarily infer a higher level of motor vehicle routes remaining open to the public, since they could be in use administratively and not appear on the motor vehicle use map (MVUM) for the national forest. In general and across all PVGs (table TW12), alternative C would reduce risk to snags the most as it has the least amount of active management and the lowest desired open motor vehicle route density. On the other hand, alternative D would have the greatest risk, due to a desire for higher open motor vehicle route density and more active management.

Table TW12. Percent of each national forest by alternative with a desired open motor vehicle route density of less than 1.5mile per square mile based on acres of management areas

National Forest	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Malheur	5%	16%	36%	12%	17%	17%
Umatilla	23%	42%	55%	32%	41%	41%
Wallowa-Whitman	23%	37%	58%	31%	38%	38%

The impact from open motor vehicle route density to snags in all likelihood would be greatest in the dry forest PVG since it currently has the greatest open motor vehicle route density per acre of all the PVGs. The desired condition for open motor vehicle route density in MA 4A for all alternatives exceeds what was modeled as high (greater than 2.0 miles per square mile) and therefore the risk from open motor vehicle routes as modeled basically would only change measurably for alternative C. Alternative C includes MA 3C, which would have a desire that meets the low category. Although both alternatives E and F include MA 3C on the Umatilla and Wallowa-Whitman National Forests, it represents less than 1 percent of the landscape, which in all probability would not result in a measureable improvement.

The risk to larger snags (21 inches DBH or greater) from firewood harvest is currently ameliorated on all three national forests by restricting harvest to within 300 feet of a road and to snags less than 20 inches DBH per the firewood permit. It is assumed that this restriction on personal use firewood would continue in order to comply with the standard (WLD-HAB-12 S-7- except alternative D), to retain snags greater than 21 inches DBH. Even so, the increased road density in Alternative D increases the risk of snag loss due to wood cutting and hazard tree removal.

The white-headed woodpecker is considered apparently secure (NatureServe 2012) both globally (G4) and nationally (N4). Both the Oregon and Washington populations are considered imperiled or vulnerable (S2/S3).

Malheur National Forest

Current habitat within the Malheur National Forest is well below historic levels, which causes a high level of concern for the viability of the species. As displayed in figure 21of the DEIS, the alternatives increase the amount of source habitat between 165 and 260 percent in year 20; none come close to the 40 percent threshold that has been identified in the literature (Rompré et al. 2010; Tear et al. 2005; With and Crist 1995). Although alternative D has the fastest trajectory of habitat improvement, it comes with the cost of

increased short term disturbance levels. Even so, such a trajectory would indicate that populations should be stable throughout the plan period, assuming no other complicating factors occur. The reasoning for this assumption was that the management emphasis in the plan (see Management Focus section of the proposed plan) is to restore dry forest habitat occupied by this species including the reduction in fuels and thus reduce risk of fire, and insect outbreak.

Under any alternative it is likely that proposed management activities **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Management focus for all alternatives is the restoration of the dry ponderosa pine habitat
2. Habitat is estimated to increase under all alternatives based on the focal species assessment model for this species.
3. The white-headed woodpecker is considered apparently secure nationwide.
4. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
5. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Umatilla National Forest

Current habitat within the Umatilla National Forest is well below historic levels, which causes a high level of concern for the viability of the species. As displayed in figure 22 of the DEIS, the alternatives increase the amount of source habitat between 248 and 419 percent in year 20; none come close to the 40 percent threshold that has been identified in the literature (With and Crist 1995, Tear et al. 2005, and Rompré et al. 2010). Alternative D has the fastest trajectory of habitat improvement, but it comes with the cost of increased short term disturbance levels. Even so, such a trajectory would indicate that populations should be stable throughout the plan period, assuming no other complicating factors occur (see discussion for the Malheur National Forest).

Under any alternative it is likely that proposed management activities **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Management focus for all alternatives is the restoration of the dry ponderosa pine habitat
2. Habitat is estimated to increase under all alternatives based on the focal species assessment model for this species.
3. The white-headed woodpecker is considered apparently secure nationwide.
4. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
5. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Wallowa-Whitman National Forest

Current habitat on the Wallow-Whitman is well below historic levels, which causes a high level of concern for the viability of the species. As displayed in figure 23 of the DEIS, the alternatives increase the

amount of source habitat between 194 to 359 percent in year 20; none come close to the 40 percent threshold that has been identified in the literature (With and Crist 1995, Tear et al. 2005, and Rompré et al. 2010). Alternative D has the fastest trajectory of habitat improvement, but it comes with the cost of increased short term disturbance levels. Even so, such a trajectory would indicate that populations should be stable throughout the plan period, assuming no other complicating factors occur. The reasoning for this assumption was that the management emphasis in the plan (see Management Focus) is to restore dry forest habitat occupied by this species including the reduction in fuels and thus reduce risk of fire, and insect outbreak.

Under any alternative it is likely that proposed management activities **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Management focus for all alternatives is the restoration of the dry ponderosa pine habitat
2. Habitat is estimated to increase under all alternatives based on the focal species assessment model for this species.
3. The white-headed woodpecker is considered apparently secure nationwide.
4. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
5. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects

Past activities, actions, and events that affect the white-headed woodpecker and its habitat include timber harvest and fire suppression. Past timber harvest targeted large diameter open-grown (single-strata) ponderosa pine that this species is dependent on for foraging, reducing the quality and quantity of habitat for this species. Harvest also impacted large diameter ponderosa pine snags used for nesting by this species. Fire suppression has allowed for the encroachment of fire-intolerant conifer species into historically open ponderosa pine stands. The composition and structure of these stands has changed, reducing the quality of these stands for the white-headed woodpecker. These activities, actions, and events have combined to create the existing condition of white-headed woodpecker habitat in the analysis area.

Ongoing (present) and reasonably foreseeable future activities in the analysis area that affect the white-headed woodpecker or its habitat include fire suppression. This activity is having the same effects as those described previously.

Open Forest Family/All Forest Communities Group

Fringed Myotis (Regional Forester's Sensitive Species in Oregon)

Life History and Habitat Description

Fringed Myotis *(Myotis thysanodes)* occurs from sea level to 2,850 m but is most common at middle elevations 1200 to 2,100 m. Although the fringed myotis is found in a wide variety of habitats including desert scrub, mesic coniferous forest, grassland, and sage-grass steppe its distribution is patchy and it appears to be most common in drier woodlands (oak, pinyon-juniper, ponderosa pine). They roost in crevices in buildings, underground mines, rocks, cliff faces, and bridges. Roosting in decadent trees and

snags, particularly large ones, is common throughout its range in western U. S. and Canada. Roosts have been documented in a large variety of tree species and it is likely that structural characteristics (e.g. height, decay stage) rather than tree species play a greater role in selection of a snag or tree as a roost. Recent research by Laki and Baker (2007) found snags are a less significant component of roosting habitat of fringed myotis in ponderosa pine forests on the east side of the Cascades (in OR and WA) than has been reported for the species in other regions of its distribution. However, they cautioned that it is unclear whether this is an actual preference for crevices in rocks by fringed myotis or represents a shortage of quality snags for roosting and warrants further study.

The fringed myotis consumes mostly beetles and moths (Black 1974; Whitaker et al. 1977). They forage by "hover-gleaning" insects off of foliage. The fringed myotis forages in a heterogeneous mix of conifer forests and shrubland/grassland with ample water sources (Keinath 2004). Open water sources are important so the bats can drink while flying. Although the Interior Columbia Basin identified this species as occurring in a broad range of forests and woodland habitats (Group 26), Wisdom et al. 2000, concluded that all the bat species within group 26 have a strong association with water and riparian vegetation.

In eastern Oregon, the fringed myotis can be found in a wide variety of habitats; however it seems to prefer forested and riparian areas (Csuti et al. 2001). Keinath, 2004, concluded that fringed myotis are found mainly in dry habitats where open areas are interspersed.

Important habitat components include roost sites, hibernacula and availability of water. The fringed myotis will roost in man-made structures such as buildings, underground mines and bridges(O'Farrell and Studier 1980). They will also roost in decadent trees and snags. Weller and Zabel (2001) examined 52 roost sites in a Douglas-fir forest in northern California and found the following: all 52 sites were in snags; most were in snags greater than 12 inches in diameter; only decay class 2 and 3 snags were used; roost sites tended to be near stream channels; in at least fifteen of the sites the bats were roosting beneath the exfoliating bark. They also found that bats frequently changed roost sites. Although Lacki and Baker (2007) found that snags were not as important as previously reported for east of the Cascades, those that were used were larger in diameter and taller in height than random snags. Rabe et al. (1998) found that snags used for roosts were more likely to have exfoliating bark than random snags and concluded that snag roosting bats require higher densities of snags than cavity nesting birds.

Fringed Myotis was placed in the Family/Group of Open Forest/All Forest Communities by Wales et al. (2011). Although identified as a focal species, source habitat was not modeled for this species. Source habitat for the fringed myotis is essentially the same as for the western bluebird (forests with >15" DBH, and open canopies) which was modeled. Very important to fringed myotis is the presence of roosting substrates such as large trees, snags, rocks and cliffs. Some of these habitat quality factors were not part of the focal species assessment model for the focal species, western bluebird.

Threats

The greatest threat is human disturbance of roost sites, especially maternity colonies, through recreational caving and mine exploration (Weller 2005), Keinath 2004). Other threats include closure of abandoned mines, renewed mining at historic sites, toxic material impoundments, pesticide spraying, vegetation conversion, livestock grazing, timber harvest, and destruction of buildings and bridges used as roosts (Weller 2005, Keinath 2004). Alteration/destruction or disturbance at roost sites can potentially cause bats to abandon the site (Keinath 2004). Changes in habitat that modifies microclimate in or near roosts may also impact bats (Richter et al. 1993).

Determination of Effects

It is expected that fringed myotis would have similar trends in habitat as the focal species western bluebird. The viability outcome for western bluebird declined from historical habitat levels due to open

canopied forests being well below the HRV median in most areas across the 3 planning units. The viability outcome for the western bluebird is primarily an E on the three planning units.

The viability outcome for the western bluebird historically was projected to be an A, while currently on all three national forests the viability outcome is projected to be an E (Wales et al. 2011). This results in a high to moderate-high level of concern for the viability of the western bluebird across all three forests (Table WB-1). The main factor leading to this level of concern is the historic loss of open habitats within the forested community resulting in levels far below HRV for these habitats. At the same time it should be pointed out that this habitat type was highly abundant and still is common across all three forests. In all likelihood, source habitat for the fringed myotis would follow a similar pattern as the western bluebird resulting in a similar viability concern.

Table WB-1: Level of viability concern by national forest for the western bluebird currently and under each alternative.

	Level of viability concern						
		Alternative					
National Forest	Current	A	B	C	D	E	F
Umatilla	H	H	H	H	M/H	M	H
Malheur	H	H	H	H	M/H	M/H	H
Wallowa-Whitman	H	H	H	H	M/H	M/H	H

The presence of roosting structure is an important habitat quality factor for these bats and any change in the abundance of roosting structures would be important for this species. There is no expected change in the abundance of roosting structures in rocks or cliffs or anthropogenic structures due to management. All alternatives except D indicate that bat maternity and roost sites should not be disturbed (WLD-HAB-18 G-7). Additionally in Alternative C there is a standard to survey for presence of all bats prior to potentially disturbing activities (WLD-HAB-23 *New*). All alternatives except D also have a standard to protect (within 1200 feet) known nesting sites of sensitive species (WLD-HAB-6 S-1).

All alternatives except D have standards and/or guidelines protecting large (>=21" DBH) trees and to protect snags in alternatives B, C, E and F (OF-1 G-59, OF-2 G-60, WLD-HAB-12 S-7). All alternatives also have provisions protecting trees with nest cavities (e.g., WLD-HAB-11 G-1).

The fringed myotis is considered apparently secure (NatureServe 2012) both globally (G4) and nationally (N4). The Oregon population is considered imperiled (S2).

Malheur National Forest

Based on the focal species analysis for the western bluebird, habitat for the fringed myotis within the Malheur National Forest is below historic levels, which causes a high level of concern for the viability of the species. As displayed in figure 26 of the DEIS, all alternatives remain above the 40 percent threshold of source habitat that has been identified in the literature (Rompré et al. 2010; Tear et al. 2005; With and Crist 1995) as a "critical threshold for habitat". All alternatives except D reduce source habitat below the current level in the first decade, and only E and D improve habitat above current levels by the second decade. Although the level of concern for viability remains high, source habitat was highly abundant on the Malheur (over 1 million acres), and so habitat is still relatively common. This reduces the immediate concern for the persistence of species associated with the open forest habitat under all alternatives. Because the fringed myotis is highly vagile, individuals should be able to interact under all alternatives, indicating a high likelihood that all alternatives would maintain viable populations over the life of the plan based on habitat. Part of the reasoning for this assumption is that the management emphasis in the plan (see Management Focus section of the proposed plan) is the restoration (movement towards HRV) of

forested habitats occupied by this species including the reduction in fuels and thus reduces risk of fire, and insect outbreak.

All alternatives desire snag and downwood retained at levels similar to what occurred historically (see section 1.14 Snags and Down Wood in DEIS). As indicated above, all alternatives except D have additional plan components that provide added protection to fine-scale habitat components needed by fringed myotis. Assuming no other complicating factors occur, these desired conditions/plan components combined with the habitat trajectory would indicate that populations should be stable throughout the plan period under any alternative.

Although the fringed myotis is only suspected to occur on the Malheur (Table 1), it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Although habitat is estimated to be less than what occurred historically it is still relatively common.
2. Habitat is estimated to increase under all alternatives based on the focal species assessment model for the focal species representing this group.
3. The fringed myotis is highly capable of dispersal throughout the planning area.
4. The fringed myotis is considered apparently secure both globally and nationwide.
5. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
6. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Umatilla National Forest

The fringed myotis is not suspected nor documented as occurring on the Umatilla National Forest (Table 1) and therefore implementation of any of the alternatives would have No Impact on this species.

Wallowa-Whitman National Forest

Based on the focal species analysis for the western bluebird, habitat for the fringed myotis within the Wallowa-Whitman National Forest is below historic levels, which causes a high level of concern for the viability of the species. As displayed in figure 28 of the DEIS, currently habitat is below the 40 percent threshold of source habitat that has been identified in the literature (Rompré et al. 2010; Tear et al. 2005; With and Crist 1995) as a "critical threshold for habitat". At the end of the first decade all alternatives increase source habitat to above 40 percent or greater and only E and D improve habitat sufficiently by the second decade to cause a change in the level of concern for viability. Although the level of concern for viability is high, source habitat was highly abundant on the Wallowa-Whitman (over 600 thousand acres), and so habitat is still relatively common. This reduces the immediate concern for the persistence of species associated with the open forest habitat under all alternatives. Because the fringed myotis is highly vagile, individuals should be able to interact under all alternatives, indicating a high likelihood that all alternatives would maintain viable populations over the life of the plan based on habitat. Part of the reasoning for this assumption is that the management emphasis in the plan (see Management Focus section of the proposed plan) is the restoration (movement towards HRV) of forested habitats occupied by this species including the reduction in fuels and thus reduces risk of fire, and insect outbreak.

All alternatives desire snag and downwood retained at levels similar to what occurred historically (see section 1.14 Snags and Down Wood in DEIS). As indicated above, all alternatives except D have

additional plan components that provide added protection to fine-scale habitat components needed by fringed myotis. Assuming no other complicating factors occur, these desired conditions/plan components combined with the habitat trajectory would indicate that populations should be stable throughout the plan period under any alternative.

The fringed myotis is documented to occur on the Wallowa-Whitman (Table 1) and it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Although habitat is estimated to be less than what occurred historically it is still relatively common.
2. Habitat is estimated to increase under all alternatives based on the focal species assessment model for the focal species representing this group.
3. The fringed myotis is highly capable of dispersal throughout the planning area.
4. The fringed myotis is considered apparently secure both globally and nationwide.
5. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
6. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

Past activities, actions, and events in the analysis area that have impacted potential roosting habitat include commercial thinning, regeneration harvest, fire suppression, and insect and disease outbreaks. Past harvest activities have impacted the quality, quantity, and distribution of large tree and snag roosting structures in the analysis area as large trees were generally targeted in these stands.

Snags potentially used as roosts would be felled to provide for safety within treatment units and along roads for safety considerations.

White-nose syndrome (a cold loving fungus) has killed hundreds of thousands of bats in the eastern United States. This disease has had a significant impact on bat populations in the eastern United States. The disease has not been confirmed in the western United States. However, the US Fish and Wildlife Service has asked that cavers to use caution when they explore caves. The disease is likely spread from cave to cave via contaminated clothes and/or equipment used by cavers.

Open Forest Family/Post-Fire Habitat Group

Lewis' Woodpecker (Regional Forester's Sensitive Species)

Life History and Habitat Description

Three main habitats used by Lewis' woodpecker throughout its range are burned or logged areas, open ponderosa pine savanna at high elevations, and riparian woodland dominated by large cottonwoods at low elevations (Abele et al. 2004; Bock 1970; Saab and Dudley 1998; Saab and Vierling 2001; Tobalske 1997). Suitability of burned areas as habitat for Lewis's woodpeckers may vary with size of burn, time since burn, intensity of burn, and geographic region (Tobalske 1997, Saab and Dudley 1998, Saab and Vierling 2001, Russell et al. 2007). Recent research by Russell et al. (2007) found that the best predictors of nest location for Lewis's woodpeckers after a wildfire in Idaho were burn severity, patch area, and

snag diameter. In a Wyoming study, nests were preferentially located within or adjacent to burned ponderosa pine forests, and in sites with greater ground cover, more downed logs, and greater amount of open sky than random sites (Linder and Anderson 1998). Linder and Anderson (1998) found that use was declining in an area that burned 20 years earlier.

Studies suggest that optimal canopy closure for nest sites is <= 30% (Linder and Anderson 1998; Sousa 1983). Some studies have suggested that Lewis's woodpeckers require a shrubby understory (e.g., Bock 1970; Sousa 1983), while others have shown that preferred habitat included a relatively sparse (<18% canopy cover) shrub layer (Block and Brennan 1987; Linder and Anderson 1998). In winter this species occupies a variety of habitat types that offer proximity to mast, fruit, or corn. Typically these are oak woodlands or orchards.

Unlike other woodpeckers, Lewis's woodpecker is not morphologically well-adapted to excavate cavities in hard wood (Spring 1965). Lewis's woodpeckers tend to nest in a natural cavity, re-use pre-existing cavities, or may excavate a new cavity in a soft snag (Harrison 1979; Raphael and White 1984; Saab and Dudley 1998; Tobalske 1997). Mated pairs may return to the same nest site in successive years. It begins breeding in late April and May. Both male and female incubate a clutch of 5 to 8 eggs for about 4 weeks. Young fledge about a month after hatching. The diet is mostly insects in spring and summer, with berries and seeds important in the fall.

On partially-logged burns with high nesting densities in Idaho, nest sites were characterized by the presence of large, soft snags and an average of 25 snags > 9 inches DBH per acre (Saab and Dudley 1998). Haggard and Gaines (2001) in northeast Washington found Lewis's woodpeckers in post fire habitat were more abundant in areas with <5 snags (>=9 inches DBH) per acre and were not found in areas with >=15 snags per acre following salvage logging of the burn. Saab et al. (2009) also found Lewis's woodpecker's nests sites were primarily associated with partially logged burns.

Bate et al. (2007), found that snag numbers were lower adjacent to roads due to safety considerations, firewood cutters, and other management activities. Other literature has also found reduced snag abundance along roads (Wisdom and Bate 2008).

Lewis' woodpecker was selected as a focal species because of its s close ties to post-fire habitats, is widespread across the western United States and occurs in suitable habitat across the planning area. This woodpecker is also associated with unburned ponderosa pine forests with open canopies and large trees as well as cottonwood/willow habitat. However, it generally is at lower abundance in these habitats than in post-fire habitat. A focal species assessment model was developed and analyzed for Lewis's woodpeckers across each of the national forests (see Wales et al. 2011). Primary source habitat was defined as wildfire areas from 2001-2007 where the pre-fire conditions were trees >=21", as well as older (1988-2000) post-fire areas in the dry PVGs. Secondary source habitat was identified as pine forests in the xeric pine (xp) and dry pine (dp) PVGs, with trees >21" and <40% canopy closure as well as cottonwood/willow habitats. The risk and habitat quality factors included in the models were snag density, and road density.

Threats

Risks to the snag density habitat component, resulting in decreases in snag densities, are likely to occur with alternatives D, E, and F due to increased levels of management. Increased in road density with Alternative D may increase loss of snags due to wood cutting and hazard tree removal.

Alternatives B, C, E, F have standards and/or guidelines protecting large trees and snags (OF-1 G-59, WLD-HAB-12 S-7). Alternative C has higher retention expectations of these larger trees. Trees with nest cavities are also provided protection (e.g., WLD-HAB-10 G-11). Additionally, as these woodpeckers are associated with post-fire habitats; some components assure that some important post-fire habitat components are maintained. Alternatives B, E, F limit salvaging snags >=21" in post fire habitats (WLD-

HAB-21 G-6) while area available for salvage harvesting is limited as well (WLD-HAB-19 G-4, WLD-HAB-20 G-5).

Determination of Effects

The current level of viability is primarily a C outcome on the Umatilla and Wallowa-Whitman National Forests and a C/D outcome on the Malheur National Forest. Historically this species estimated to have an A outcome (Wales et al. 2011). This results in a Moderately/High level of concern for the viability of the Lewis' woodpecker across all three forests (Table LW-1). This is an increase in the level of concern on both the Umatilla and the Wallowa-Whitman National Forests and no change for the Malheur National Forest. The main factor leading to the high level of concern is the amount of source habitat (Wales et al. 2011). Overall, both primary (post-fire) and secondary (open-canopied large ponderosa pine) source habitats occur at levels below what was estimated to have occurred historically as well as the lower distribution of post-fire habitats.

At year 20, primary habitat decreases from current conditions to below HRV median. Primary habitat is post-fire with large trees and snags. There is a high degree of uncertainty when modeling historical and future fire occurrence, which leads to a commensurate degree of uncertainty in projecting the amount of post-fire habitat that provides source habitat for this woodpecker. Secondary habitat increases for all alternatives but continues to remain well below HRV. Secondary habitat is open dry forest with large ponderosa pine, which is well below HRV across the forest.

Table LW-1: Level of viability concern by national forest for the Lewis' woodpecker currently and under each alternative.

	Level of viability concern						
		Alternative					
National Forest	Current	A	B	C	D	E	F
Umatilla	M	M/H	M/H	M/H	M/H	M/H	M/H
Malheur	M/H	M/H	M/H	M/H	M/H	M/H	M/H
Wallowa-Whitman	M	M/H	M/H	M/H	M/H	M/H	M/H

All alternatives on all forests have a desired condition for fire to play a greater role in creating natural disturbances (see section 1.4.1 Wildland fire in the DEIS) across the landscape. The potential to achieve the desired disturbance over the life of the plan exists, but it is very dependent upon the risks to life and social/economic values, making it extremely difficult to predict how much and where post-fire habitat might occur.

Lewis's woodpecker is considered apparently secure (NatureServe 2012) both globally (G4) and nationally (N4). For both states the breeding population is considered imperiled or vulnerable (S2S3B).

Malheur National Forest

Wales et al. (2011) projected primary source habitat (post-fire habitats) to decrease from current levels to below the HRV median in the next two decades. Because the amount of post-fire habitat declines in the short-term under all alternatives, there may be a reduction in suitable primary habitat for the Lewis' woodpecker. Secondary source habitat (not including cottonwood riparian) however increases under all

alternatives (see figure 30 in the DEIS) on the Malheur. Although the concern for viability does not change, the strong upward trend in secondary source habitat, the high degree of uncertainty in predicting changes in primary habitat and the high dispersal ability of this woodpecker suggests that all alternatives would have a high likelihood of improving the viability of this species. Therefore, under any alternative it is likely that proposed management activities **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Although primary habitat is estimated to be less than what occurred historically it is still relatively common and it is extremely difficult to predict future occurrence with any certainty.
2. Secondary habitat is estimated to strongly increase under all alternatives based on the focal species assessment model for this species.
3. The Lewis' woodpecker is highly capable of dispersal throughout the planning area.
4. The Lewis's woodpecker is considered apparently secure both globally and nationwide.
5. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
6. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Umatilla National Forest

Similar to the Malheur, primary source habitat (post-fire habitats) is predicted to decrease from current levels to below the HRV median in the next two decades (Wales et al. 2011). Because the amount of post-fire habitat declines in the short-term under all alternatives, there may be a reduction in suitable primary habitat for the Lewis' woodpecker. Secondary source habitat (not including cottonwood riparian) however increases under all alternatives (see figure 31 in the DEIS) on the Umatilla. Although the concern for viability changes from Moderate to Moderate/High, this is largely due to the predicted change in post-fire habitat which may or may not be an artifact of the vegetation model. Acknowledging the high degree of uncertainty in predicting changes in primary habitat, the strong upward trend in secondary source habitat and the high dispersal ability of this woodpecker suggests that all alternatives would have a high likelihood of improving the viability of this species. Therefore, under any alternative it is likely that proposed management activities **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Although primary habitat is estimated to be less than what occurred historically it is still relatively common and it is extremely difficult to predict future occurrence with any certainty.
2. Secondary habitat is estimated to strongly increase under all alternatives based on the focal species assessment model for this species.
3. The Lewis' woodpecker is highly capable of dispersal throughout the planning area.
4. The Lewis's woodpecker is considered apparently secure both globally and nationwide.
5. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
6. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Wallowa-Whitman National Forest

Wales et al. (2011) projected primary source habitat (post-fire habitats) to decrease from current levels to below the HRV median in the next two decades. Because the amount of post-fire habitat declines in the short-term under all alternatives, there may be a reduction in suitable primary habitat for the Lewis' woodpecker. Secondary source habitat (not including cottonwood riparian) however increases under all alternatives (see figure TW32 in the DEIS) on the Wallowa-Whitman. Although the concern for viability changes from Moderate to Moderate/High, this is largely due to the predicted change in post-fire habitat which may or may not be an artifact of the vegetation model. Acknowledging the high degree of uncertainty in predicting changes in primary habitat, the strong upward trend in secondary source habitat and the high dispersal ability of this woodpecker suggests that all alternatives would have a high likelihood of improving the viability of this species. Therefore, under any alternative it is likely that proposed management activities **may impact individuals** or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Although primary habitat is estimated to be less than what occurred historically it is still relatively common and it is extremely difficult to predict future occurrence with any certainty.
2. Secondary habitat is estimated to strongly increase under all alternatives based on the focal species assessment model for this species.
3. The Lewis' woodpecker is highly capable of dispersal throughout the planning area.
4. The Lewis's woodpecker is considered apparently secure both globally and nationwide.
5. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
6. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

Past activities, actions, and events that affected the Lewis' woodpecker and its habitat include timber harvest, fire suppression, and wildfire. All of these have occurred on lands outside of the Forest Service as well. Past timber harvest targeted large diameter open-grown (single-strata) ponderosa pine and Douglas-fir that this species is dependent on for foraging and nesting. Harvest also impacted large diameter snags, reducing potential nesting habitat. Fire suppression has allowed for the encroachment of fire-intolerant conifer species into historically open ponderosa pine and Douglas-fir stands. The composition and structure of these stands has changed, reducing the quality of these stands for the Lewis' woodpecker. Burned forest is considered a source habitat for this species.

Suppression of fire as well as harvesting of lands outside of National Forest lands for timber production (including salvage) are expected to continue as currently practiced. As such, it is not expected that these lands will appreciably contribute to either suitable primary secondary habitat for the Lewis' woodpecker.

Upland Grassland Family/Upland Grassland Group

Upland Sandpiper

Life History and Habitat Description

The upland sandpiper is an example of a sensitive species that has extremely limited distribution on the national forests of Oregon. In Oregon they are considered rare and disjunct from their populations in the eastern and mid-western U.S. Wintering in South America (and rarely farther north); this long-distance migrant arrives at its nesting grounds in March-May. Identified as a focal species for the grassland habitat type, an assessment model was not developed due to their limited distribution. The upland sandpiper is distributed sparingly west of the Rocky Mountains in high-altitude meadows of Washington, Oregon and Idaho (Houston and Bowen 2001) where it breeds at scattered locations in southwest Union, southern Umatilla, southern Grant, and western Lake Counties in central and eastern Oregon (Gilligan et al. 1994). Most recent (1990s) breeding locations in northeastern Oregon were in Bear Valley (private lands adjacent to Malheur National Forest) and Logan Valley (Malheur National Forest). Other sightings have occurred in the planning area, but breeding has not been documented.

The main range for the upland sandpiper is the north central portion of the United States east of the Rocky Mountains (Houston and Bowen 2001) with sparse and often isolated populations breeding west of main range in North America (Dechant et al. 1999 (revised 2002)). Logan Valley and Bear Valley are the main strongholds for this species in Oregon, and for the most part Bear Valley is private land (ODFW 2006). Because Oregon is a minor portion of the sandpiper's range, the majority of research available on this species has been conducted in the east of the Rocky Mountains.

In general, upland sandpipers seem to prefer large (100 hectares or more) grassland-associated landscapes that offer a mix of vegetation heights, including short grass areas for courtship displays as well as taller grasses for nesting cover on breeding grounds and on migration and non-breeding grounds, they will use a variety of habitats, from natural grasslands to cultivated or grazed fields (Vickery et al. 2010). Upland sandpipers nest in open flats consisting of native grasses and forbs (Akenson 1991). Two key components of upland sandpiper habitat are nesting cover and availability of insects for young sandpipers (Akenson and Schommer 1992). Sandpipers forage in open meadows for grasshoppers and crickets, but also eat ants, berries and seeds of grasses and forbs (Csuti et al. 1997)

This species generally uses dry grasslands "with low to moderate forb cover, low woody cover, moderate grass cover, moderate to high litter cover, and little bare ground" (Dechant et al. 1999 (revised 2002)). The small and declining populations in mountain valleys and open uplands of NE Oregon (Union, Umatilla, Grant Cos.) are unusual because of altitude (1,035–1,585 m), use of sedge stands and of slightly elevated mounds in wet meadows, and location within 100 m of forest edge (Akenson 1991; Herman and Scoville 1988; Houston and Bowen 2001). Nests are usually hidden within a clump of vegetation, usually grasses and some forbs. The nest is a grass-lined depression with a normal clutch of 4 eggs.

Upland Sandpipers in Oregon, are found in montane meadows ranging 1,000-30,000 ac (400-12,000 ha) at 3,400-5,060 ft (1,036-1,542 m) elevation, generally surrounded by lodgepole sometimes ponderosa pine forests (Stern 2003). Meadows include native and non-native grasses and forbs, often with a small intermittent creek nearby; they may have a component of sagebrush within or along the margin. Presence of forbs such as cinquefoil may be a critical component of nesting habitat (Herman and Scoville 1988).

Threats

At present, loss, degradation, and fragmentation of habitat due to increased urbanization, changes in farming practices and natural forest succession pose the most serious threats to populations (NatureServe 2012). Loss of habitat to agriculture and urban development and heavy grazing is thought to be the

biggest factor in upland sandpiper decline (Houston and Bowen 2001). Other reasons for decline are uncertain, but may include habitat loss caused by encroachment of pine into meadows and use of herbicides to control and eliminate the forb component of the nesting meadows (Stern 2003).

Grazing and recreation would be the major management actions that may impact habitat for this species. The upland rangeland condition in general has improved from the early 1950s but has stabilized in the last decade (see rangeland section of the DEIS). Because some studies report only the presence of upland sandpipers and not how they use grazed areas, it is difficult to give a general statement on effects of grazing on upland sandpipers (Vickery et al. 2010). Basically, sandpipers have been found using grazed areas for nesting, foraging and brood rearing (Bowen and Kruse 1993, Dechant et al. 1999 (revised 2002), Houston and Bowen 2001). Within mixed-grass and tallgrass prairie in South Dakota, nest densities did not differ between idle sites and sites that were grazed in May at a grazing rate of 1.0-2.5 AUM/ha, and in which 20 to 80 percent of the current year's growth was removed (Kaiser 1979). Fourteen nests were found within a 256-ha fragment of moderately grazed prairie in South Dakota (Lokemoen and Duebbert 1974). Kirsch and Higgins (1976) reported that mean nest productivity was lowest on tilled areas (where no nests were observed), higher on grazed and idle areas, and highest on burned areas. Nest loss occasionally occurs as a result of trampling by cattle (Ailes 1980; Bowen and Kruse 1993). None of the alternatives propose any activity that would attract or reduce the amount of recreation other than restricting motor vehicle access.

Determination of Effects

Upland sandpipers were identified as a focal species in the R6 Terrestrial Species Assessment (USDA 2010), but due to their limited distribution and unique habitat within the planning area, a focal species assessment model was not developed

Table 3x-GR shows the differences among alternatives regarding how much grassland habitat is within active allotments. Alternative C is the only alternative that is substantially different from any of the other alternatives. Current grazing assessed at the forest wide scale appears to allow sufficient residual cover to satisfy the needs for nesting and foraging habitat for this species and although it is recognized that small areas exist that do not, these would be addressed at the project level. Basically in regards to grazing alternative C has the least probability of potential impacts from grazing. Although alternatives A, B, E, and F have the same amount of source habitat within active allotments, alternatives E and F should have the least impact due to a lower utilization level (see table 312 in the DEIS), followed by alternative A (see table A-8, appendix A of the DEIS) and then alternative B. It is unknown what utilization level may affect this species, but overgrazing of meadows, especially in spring and early summer during incubation and brood rearing, could have a direct impact. Because domestic livestock grazing is proposed to be moderate under most alternatives (see tables 312 and 313 in the DEIS) and should be managed to achieve the desired conditions stated in appendix A, it is unlikely, other than the potential for the trampling of a nest, that grazing would be detrimental to the breeding population of this species.

Table 3x-GR: Estimated percent of upland sandpiper habitat that occurs within active grazing allotments by alternative and national forest.

Alternative(s)	Malheur National Forest		Umatilla National Forest		Wallowa-Whitman National Forest	
	Dry	Moist	Dry	Moist	Dry	Moist
A, E, and F	94%	87%	44%	33%	79%	87%
B	93%	87%	48%	40%	79%	87%
C	39%	32%	6%	2%	2%	3%
D	96%	89%	44%	33%	80%	88%

Forest succession into source habitat will be managed in all alternatives as the desire is to move toward HRV in all community types, recognizing that forest succession into grasslands has occurred. Management activities that decrease tree densities in grassland types should benefit this species.

The upland sandpiper is considered secure nationwide (NatureServe 2011). Species that occupy the periphery of their range are often found in less favorable habitats and exhibit lower and more variable densities (Brown 1984; Brown et al. 1995; Gaston 1990) which probably accounts for its ranking as critically imperiled for Oregon.

Malheur National Forest

The upland sandpiper is documented as occurring on the Malheur National Forest (table 1) and although the vast majority of sandpiper habitat occurs within active grazing allotments, all alternatives have the desired condition for understory in the uplands to be in ecological phases of A or B (see *livestock grazing and rangeland vegetation* section in DIES). Since moderate grazing does not appear to be detrimental and recreation levels are not encouraged to increase under any alternative, it is assumed that under any alternative it is likely that proposed management activities **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Upland sandpipers are migratory and breeding populations in the west are considered disjunct from the major breeding population of this species in the United States.
2. Upland rangeland conditions have generally improved from the 1950's in the Blue Mountains.
3. The upland sandpiper is highly capable of dispersal throughout the planning area.
4. The upland sandpiper is considered secure nationwide.
5. Two out of three major threats (urbanization and agriculture) do not occur on NFS lands.
6. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Umatilla National Forest

There are no recent observations of these sandpipers on the Umatilla National Forest. Older records for the species occurred near the town of Ukiah and on the Bridge Creek Wildlife Area, neither of which are on NFS lands. The majority of sandpiper habitat occurs within active grazing allotments; all alternatives have the desired condition for understory in the uplands to be in ecological phases of A or B (see *livestock grazing and rangeland vegetation* section in DIES). Since moderate grazing does not appear to be detrimental and recreation levels are not encouraged to increase under any alternative, it is assumed that under any alternative it is likely that proposed management activities **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Upland sandpipers are migratory and breeding populations in the west are considered disjunct from the major breeding population of this species in the United States.
2. Upland rangeland conditions have generally improved from the 1950's in the Blue Mountains.
3. The upland sandpiper is highly capable of dispersal throughout the planning area.
4. The upland sandpiper is considered secure nationwide.
5. Two out of three major threats (urbanization and agriculture) do not occur on NFS lands.

6. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.

7. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Wallowa-Whitman National Forest

Upland sandpipers are uncommon on the Wallowa-Whitman National Forest. A pair was documented on the La Grande Ranger District near Campbell Flats (Starkey Experimental Forest) in the1990s (Akenson 1991) and several pair were located in the Marley Creek (Akenson 1993). Surveys for upland sandpipers have not been conducted since the early 1990s. The majority of sandpiper habitat occurs within active grazing allotments; all alternatives have the desired condition for understory in the uplands to be in ecological phases of A or B (see *livestock grazing and rangeland vegetation* section in DIES). Since moderate grazing does not appear to be detrimental and recreation levels are not encouraged to increase under any alternative, it is assumed that under any alternative it is likely that proposed management activities **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Upland sandpipers are migratory and breeding populations in the west are considered disjunct from the major breeding population of this species in the United States.
2. Upland rangeland conditions have generally improved from the 1950's in the Blue Mountains.
3. The upland sandpiper is highly capable of dispersal throughout the planning area.
4. The upland sandpiper is considered secure nationwide.
5. Two out of three major threats (urbanization and agriculture) do not occur on NFS lands.
6. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
7. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

The upland sandpiper is a long distance migrant, spending the larger part of its life outside the boundaries of the National Forest. Historically, upland sandpipers were intensively hunted in North America. For example, in 1890, two game dealers in Boston received over 9,000 upland sandpipers for sale (Vickery et al. 2010). From the late 1870s to approximately 1890, some 50,000 to 60,000 upland sandpipers were shipped annually from Nebraska (Houston and Bowen 2001). Although no longer intensively hunted, the effects of market hunting may persist to the present.

The use of insecticides and other agrochemicals associated with cultivation practices has been identified as one of the main threats to the Upland Sandpiper on its wintering grounds (Vickery et al. 2010). Changes in ranching and farming practices may also be impacting critical stopover habitats needed during migration (Moore 2000).

Human Disturbance Family/Habitat Generalist Group

American peregrine falcon

Life History and Habitat Description

One of the most widely distributed of warm-blooded terrestrial vertebrates, the Peregrine Falcon occurs from the tundra to the Tropics, from wetlands to deserts, from maritime islands to continental forests, and from featureless plains to mountain crags—it is absent as a breeder only from the Amazon Basin, the Sahara Desert, most of the steppes of central and eastern Asia, and Antarctica (White et al. 2002).

Peregrines are found in many terrestrial biomes in the Americas; none seems to be preferred (although perhaps greater densities in tundras and coastally). The most commonly occupied habitats contain cliffs, for nesting and generally open landscapes for foraging (Hayes and Buchanan 2002; Hays and Milner 2004)). Prominent cliffs function as both nesting and perching sites, and provide unobstructed views of the surrounding landscape (White et al. 2002, Hayes and Buchanan 2002). Nest site suitability requires the presence of ledges that are essentially inaccessible to mammalian predators, provide protection from the elements, and are dry (Johnsgard 1990). A source of water, such as a river, lake, marsh or marine waters is typically in close proximity to the nest site and likely is associated with an adequate prey base of small to medium sized birds (Johnsgard 1990).

Peregrines will nest at locations other than cliff sites, such as at the apex of steep, grass-covered slopes (Beebe 1960), tall buildings and bridges in urbanized or industrial environs (Luniak 2004), rock quarries (White et al. 1988), and very rarely, in trees (Emison et al. 1997).

On average, peregrine falcon eyeries were about 200 feet (60 meters) from a fresh water source in Washington (Hayes and Buchanan 2002). This study reported only a few sites more than 1000 feet (305 meters) from a creek or a body of water >3 acres (1.2 ha) in size (Hayes and Buchanan 2002).

Peregrines range over extensive areas when hunting prey. In Colorado, hunting territories may extend to a radius of 12-15 mi from nest sites (Towry 1987) or greater (Enderson and Craig 1997). In Washington, Dobler (as cited by Hayes and Buchanan 2002) found that home range size during a single winter for an immature female was 24 mi^2 and 30.9 mi^2 for an immature male with areas of concentrated activity being 5 mi^2 and 9 mi^2 for the female and male, respectively.
The wide variety of habitat types and prey species used by the peregrine and the increasing population trend suggest that foraging habitat and prey populations are not currently limiting the population (Hayes and Buchanan, 2002). Even though the increase in human population has led to the degradation of some of foraging areas, pigeon populations associated with urban areas have resulted in increased foraging opportunities (White et al. 2002).

Loss of habitat was not identified as a limiting factor in peregrine recovery and was not a factor identified as contributing to the species' listing (USFWS 1999).

Threats

Rock climbing and other outdoor recreational activities, such as hiking and beach walking; falconry; and industrial activities, such as blasting, can be significant sources of disturbance to nesting peregrines (Hayes and Buchanan 2002). Human activities have been documented to cause disturbance to nesting peregrine falcons (Holthuijzen et al. 1990; Knight and Knight-Skagen 1986; Windsor 1975). Several authors have recommended 800 meter buffers on nest sites to reduce the potential effects of human disturbances on nesting peregrine falcons (Hays and Milner 2004; Richardson and Miller 1997). We assessed the potential for human disturbance to affect nesting habitat using the peregrine falcon nesting habitat disturbance index described in Gaines et al. (2003).

Peregrine falcons in the Pacific Northwest are most affected by bioaccumulation of contaminants, and direct disturbance to their nest sites; both which have caused numerous nesting failures during the previous 20 years of observation (USDI 1982).

Determination of Effects

A focal species assessment model was developed and used to analyze peregrine falcon viability across the 3 planning areas (see Wales et al. 2011). Source habitat was identified as cliff structures that were ≥5 acres in size to allow for distinguishing prominent cliffs structures from the smaller cliffs that were unlikely to provide nesting habitat. Risk and habitat quality factors included in the models were the amount of nesting and foraging habitat within each watershed, and habitat effectiveness in relation to nesting habitat.

The estimated viability outcome on both the Umatilla National Forest and the Wallowa-Whitman National Forest historically was a B/C primarily due to projected distribution across the planning areas. Currently the viability outcome is projected to be a B/C outcome on the Umatilla National Forest, and a C outcome on the Wallowa-Whitman National Forests. The current drop in outcomes is due to human disturbance (e.g. roads in close proximity to source habitat). Wales et al. (2011) did not evaluate viability using the model for the Malheur National Forest due to the extremely limited (<200 acres) amount of source habitat spread across7 watersheds. Although viability was not modeled on the Malheur National Forest, it is likely that similar trends have occurred.

The main factor that may affect this species is the potential change in habitat effectiveness. Much of the source habitat is located within or in close proximity to both key watersheds and Riparian Management Areas. All alternatives have desired conditions, objectives and standards and guidelines which would not increase the risk to peregrine falcon viability. Closure of roads adjacent to cliff habitats would also benefit the species. Alternative C describes the highest potential to close roads, and depending on the location of these road closures, this alternative could have the greatest beneficial effect for the species. However in all likelihood, based on table AP-1, the concern for viability will remain the same as current under any alternative, with the potential to increase slightly due to plan components that could lead to increased habitat effectiveness as discussed below.

Table AP-1: Level of viability concern by national forest for the peregrine falcon currently and under each alternative.

	Level of Concern						
		Alternative					
National Forest	Current	A	B	C	D	E	F
Umatilla	L/M	L/M	L/M	L/M	L/M	L/M	L/M
Malheur *	L/M	L/M	L/M	L/M	L/M	L/M	L/M
Wallowa-Whitman	L/M	L/M	L/M	L/M	L/M	L/M	L/M

*Although viability was not modeled for this species, the level of concern will likely be similar to the other Umatilla and Wallowa-Whitman National Forests.

All alternatives have a standard to protect (within 1200 feet) known nesting sites of sensitive species. In Alternative A, there is a similar Standard RF-2. Minimizing human disturbance near to potential nesting areas will benefit peregrine falcons. In addition, alternatives B, C, D, E, and F incorporate Standard KW-1 S-15, and alternative A-Guideline RF-1 (119) which seek to limit new road construction in riparian areas.

The peregrine falcon is still considered vulnerable (NatureServe 2012) nationally (N3) for both breeding and non-breeding populations.

Malheur National Forest

Although peregrines are documented for the Malheur (Table 1) there are no known peregrine falcon nest sites on the Forest. As indicated above, traditional nesting habitat is not abundant on the forest. Even so, given that none of the alternatives actively seek to increase recreation levels and access will remain what it is currently or be reduced, it is likely that proposed management activities under any alternative **may impact individuals** or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. There are no known nesting sites on the Malheur and potential nesting habitat is extremely limited.
2. Habitat effectiveness is not expected to worsen under any of the alternatives.
3. The American peregrine is highly capable of dispersal throughout the planning area and although it is still considered vulnerable nationwide, the focal species assessment model for the Blue Mountains does not indicate an increase in viability concern within the plan area.
4. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
5. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Umatilla National Forest

Peregrines are listed as suspected as occurring on the Umatilla National Forest as there has been no documentation of nesting on the Forest. Aerial surveys of potential nest sites were completed in the 1990s. These surveys and additional ground surveys failed to detect any nesting peregrine falcons on the Forest. Some Districts have reported observing peregrine falcons foraging during the fall migration (non-breeding season). Given the results of the focal species assessment model and that that none of the alternatives actively seek to increase recreation levels, it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. There are no known nesting sites on the Umatilla.
2. Habitat effectiveness is not expected to worsen under any of the alternatives and there are no actions identified in the plan that would cause destruction of nesting habitat.
3. The American peregrine is highly capable of dispersal throughout the planning area and although it is still considered vulnerable nationwide, the focal species assessment model does not indicate an increase in viability concern within the plan area.
4. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
5. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Wallowa-Whitman National Forest

Peregrine nest site surveys have been conducted periodically in potential nesting habitat since 1991. There are five known active peregrine falcon nests on the Wallowa-Whitman National Forest, four of which are within the analysis area. One site is located in the Hells Canyon National Recreation Area near Hells Canyon Dam and is less than a mile from road 454 that accesses the boat launch and Visitors' center. Additionally there is a known peregrine eyrie that occurs on private lands adjacent to the Forest (Mark Penninger, Pers. Comm.).

Given the results of the focal species assessment model and that none of the alternatives actively seek to increase recreation levels, it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Habitat effectiveness is not expected to worsen under any of the alternatives and there are no actions identified in the plan that would cause destruction of nesting habitat.
2. The American peregrine is highly capable of dispersal throughout the planning area and although it is still considered vulnerable nationwide, the focal species assessment model does not indicate an increase in viability concern within the plan area.
3. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
4. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

There are no foreseeable future cumulative effects anticipated to occur around the peregrine nest sites that would increase human disturbance. All roads within 1 mile of each known nest site within the analysis area have already been closed to motorized vehicles. All alternatives will continue this protection from human disturbance. Human disturbance from having open roads within the peregrines hunting territories is not expected to have any effect because of their ability to forage over many miles and hunt from the air. Also, no changes in the prey base are anticipated either.

Wolverine

Life History and Habitat Description

Montane coniferous forests, suitable for winter foraging and summer kit rearing, may only be useful if connected with subalpine cirque habitats required for natal denning, security areas, and summer foraging (Copeland 1996). Similar to other large mammalian carnivores in the Rocky Mountains (e.g., *Ursus arctos*, *Canis lupus*), the current distribution of wolverines may be more determined by intensity of human settlement than by biophysical factors such as vegetation type or topography (Kelsall 1981, Banci 1994, Carroll et al. 2001).

Several researchers have documented the effects of roads on wolverines and their habitat and have included roads in models of source habitat (Wisdom et al. 2000, Carroll et al. 2001, Raphael et al. 2001, Rowland et al. 2003, Copeland et al. 2007, Krebs et al. 2007). Carroll et al. (2001) found areas with road densities <1mile/mile^2 to be a strongly correlated with the presence of wolverine. Rowland et al. (2003) in a test of the Raphael et al (2001) model, found that road density was a better predictor than habitat amount of wolverine abundance when applied at the watershed scale.

Natal dens are typically above or near treeline, require snow depths of 1-3 meters that persist into spring, and are in close proximity to rocky areas such as talus slopes or boulder fields (Copeland 1996).

The major limiting factor to wolverine populations is human caused mortality and disturbance; this species has such low population densities and reproductive rates that even a small amount of human-caused mortality can substantially reduce population persistence (Beauvais et al. 2004).

Similar to other large mammalian carnivores in the Rocky Mountains (e.g., *Ursus arctos*, *Canis lupus*), the current distribution of wolverines may be more determined by intensity of human settlement than by biophysical factors such as vegetation type or topography (Kelsall 1981, Banci 1994, Carroll et al. 2001). Thus, specific habitat needs are not as important as reducing human disturbance, particularly in natal den sties (subalpine talus cirques) during the denning period.

Wolverines are considered rare throughout all of Oregon, Washington, Idaho, and California; although recent sightings, tracks, and a road kill document their continued presence at low densities (Copeland 1996). Records for eastern Oregon include a partial skeleton and tufts of fur found near Canyon Mountain, Grant County (1992), tracks and a possible denning site discovered in the Strawberry Mountain Wilderness (1997), and tracks that were noted in the Monument Rock Wilderness (1997). Most recently Magoun et al. (2011) using remote cameras confirmed three wolverines in the Wallowa Mountains of Northeast Oregon.

Banci (1994) identified the need for large areas of the appropriate vegetation types and with low human use to provide for the conservation of wolverine. Copeland (1996) documented the potential for disturbance to wolverine natal dens as a result of late-winter to spring snowmobile and other winter recreation activities.

The impacts of roads and OHV activities on wildlife and their habitats are numerous and well documented. Networks of roads and trails fragment habitat, reduce patch size, and increase the ratio of edge to interior (Ouren et al. 2007). This may have serious consequences for area-sensitive species (those that cannot carry out certain aspects of their life cycles without large blocks of habitat or corridors), predator-prey relationships, and overall population dynamics. In particular, fragmentation and edges created by roads and OHV routes may have strong effects on animal movement patterns (Ouren et al. 2007). Precluding or inhibiting animal movements effectively diminishes dispersal to and recolonization in other areas, thus increasing the likelihood of local extirpations.

Threats

The presence of humans may directly conflict with wolverines (Ruggerio et al 1994). Open motorized roads would allow greater human access. Hornocker and Hash (1981) found 15 of 18 mortalities of wolverine in Montana were related to human use near roads. The occurrence of comparatively stable, dense wolverine populations in British Columbia and the Yukon has been attributed to the availability of inaccessible areas, which act as natural refuges (Ruggerio et al 1994). Road closures have the potential to reduce human disturbance to wolverine and their prey.

Human intrusion within denning habitat during the spring is probably the primary threat to this species (Wisdom et al. 2000). Disturbance effects are most likely to have adverse impacts on wolverines during spring; a critical time period since weather conditions are cold, food sources may be limited, thermoregulatory demands are high and reproductive females have the added energetic demands of developing fetuses, giving birth and nursing kits. Human disturbance during this challenging time could result in increased energy expenditures and negative impacts on wolverine survival and reproductive rates.

Wilderness or remote country appears essential to wolverine viability (Hornocker and Hash 1981). Human encroachment into existing refugia may threaten the wolverine's ability to maintain basic life history requirements and may cause habitat fragmentation that could preclude subpopulation interspersion

and lead to population isolation (Copeland 1996). Rowland et al. (2003) found that wolverine were more prevalent in areas with greater amounts of habitat, lower road densities, and low human population densities. The persistence of wolverines in Montana, despite unlimited historic trapping and hunting, may be attributed to the presence of designated wilderness and remote, inaccessible habitat (Hornocker and Hash 1981, Ruggerio et al. 1994). Landscape connectivity is important to maintenance of species viability and biodiversity. Connectivity is the arrangement of habitats that allows organisms and ecological processes to move across the landscape.

In landscapes with high connectivity, patches of similar habitats are either close together or linked by corridors of appropriate vegetation, stream channels and waterways. Fragmentation is the separation or isolation of similar types of habitat, either by natural events or human activities.

Recent technological advances in motor vehicle capabilities have raised concerns about intrusion in previously isolated areas (Wisdom et al. 2000) where natal dens may occur. Increases in motorized recreation have likely displaced wolverines from potential denning habitat (Copeland 1996) or caused females to abandoned occupied dens or attempt to move young. Females with young tend to be very sensitive to disturbance especially before the kits are weaned. Copeland (1996) found that females studied in Idaho moved their young to new maternal den sites following disturbance by humans. Risk of litter loss is potentially high if den relocation occurs. Because wolverines have low reproductive rates, any losses could be substantial. In general, refugia may be the most important habitat component for availability and protection of natal denning habitat (Copeland 1996).

Determination of Effects

A focal species assessment model was developed and analyzed for wolverines across the 3 planning areas (see Wales et al.) Source habitat was identified as areas above 5,000 feet elevation, with road densities of <1 mile/mile^2, and not dry forest PVGs. Risk and habitat quality factors included in the models were presence of denning habitat, patch size of source habitat, and winter habitat effectiveness. The viability outcomes for historical were primarily an A outcome. Currently, the viability outcome on the Malheur is projected to be an E. On the Umatilla and Wallowa-Whitman National Forests, it is projected to be primarily a C/D. Outcomes have declined due primarily to an increase in road densities.

Malheur National Forest

The wolverine is listed as suspected on the Malheur (Table 1) but there is no recent evidence to indicate that the forest currently contains occupied habitat. The Natural Resource Information System (NRIS) database contains observations from the 1990s but the credibility of these observations is unknown. The remains of a juvenile wolverine were found in the Strawberry Mountain Wilderness in 1992 and verified by Oregon State University (Kranich 2011 (14 Dec)). Winter helicopter surveys conducted by Oregon Department of Fish and Wildlife in 1997 documented a potential den site in the Strawberry Mountain Wilderness, and probable wolverine tracks near Pine Creek and in the Monument Rock Wilderness (Holden 1997). Wales et al. (2011) in assessing denning habitat found the vast majority (96%) of the watersheds on the Malheur had zero to low (1-600 acres) amounts of denning habitat (Table 3x-DEN), with only 4 having moderate amounts and there were no watersheds with high amounts (> 1400 acres). This would suggest that it would be highly unlikely that the Malheur National Forest would support a breeding population of wolverines and that occurrence on this Forest would in all likelihood represent extreme dispersal events that are not representative of self-sustaining populations as suggested by Aubry et al. (2007).

All alternatives incorporate standard WLD-HAB-6 S-1 which prohibits management activities near denning sites; however it is extremely unlikely that management actions would occur in the area and during the time of denning. Magoun and Copeland (1998) speculated that deep, persistent spring snow cover was an obligate component of wolverine reproductive denning habitat, possibly because it aides in

the survival of young by providing a thermal advantage (Pulliainen 1968) and refuge from predators (Persson et al. 2003; Pulliainen 1968). Reproductive denning begins in late February to mid-March, and post-weaning, den abandonment occurs in late April and May (Magoun and Copeland 1998; Persson et al. 2003), which for the most part is prior to when field activities associated with the plan would begin. Winter recreation then becomes the largest risk for disturbance of denning wolverines (Copeland 1996; Goldberg 2010). Additionally, recent advances in snowmobile technology capabilities has raised concerns about their ability to access previously isolated areas (Wisdom et al. 2000) where natal denning may be occurring . Wales et al. (2011) assessed winter habitat effectiveness by calculating the density of designated winter routes in wolverine habitat and determined that these routes have little effect on wolverine habitat, but recognized that this did not account for cross-country winter use. As can be seen from Table 3x-OSV, only alternative C measurably reduces the amount of Forest open to cross-country snowmobile use, whereas the other alternatives vary less than 4 percent between them.

Table 3x-DEN, Percent of watersheds by forest having zero, low (1-600 acres), moderate (601-1,400 acres) and High (> 1,400 acres) amounts of wolverine denning habitat

National Forest	Zero	Low	Moderate	High
Malheur	75	21	4	0
Umatilla	87	9	4	0
Wallowa-Whitman	58	15	18	10

In montane habitats in the southern latitudes, wolverines remain at high elevation throughout the year, avoiding lower elevation habitats with xeric conditions (Copeland et al. 2010). Several authors have attributed this to human influence (Carroll et al. 2001; May et al. 2006; Rowland et al. 2003). Carroll et al. (2001) found areas with road densities <1mile/mile2 to be a strongly correlated with the presence of wolverine. Rowland et al. (2003) in a test of the Raphael et al (2001) model, found that road density was a better predictor than habitat amount of wolverine abundance when applied at the watershed scale. As demonstrated in Figure 3x-Wolverine alternatives C does the most for reducing the risk of encounters between wolverines and humans, since it has the most area in backcountry management areas. Additionally alternative C establishes Management area 3C which is intended to be managed for linkages between large blocks of back country.

Because the Malheur National Forest is thought to be unoccupied, it is not expected that individual wolverines would be affected by implementing any of the management alternatives. All alternatives are managing habitats towards HRV and as mentioned under the Canada Lynx, the cold forest is relatively close to what occurred historically. Currently, the overall permeability of the planning area for wolverine was rated as moderate to high; meaning in all likelihood wolverine mobility is not restricted (Wales et al. 2011). There is potential for wolverines from the Rocky Mountain population to enter Oregon from Idaho, Wyoming, or Montana. Although individuals may be impacted, overall management direction of any of the alternatives would contribute to habitat conditions for viability and persistence of this species.

Based on this analysis it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. According to the proposed listing document "…, *the best scientific and commercial information available indicates that only the projected decrease and fragmentation of wolverine habitat or range due to future climate change is a threat to the species now and in the future. The available scientific and commercial information does not indicate that other potential stressors such as land management, recreation, infrastructure development, and transportation corridors pose a threat to the DPS.*"

2. Currently there are no known breeding individuals occupying the Malheur and there is very little habitat identified as potential denning habitat.
3. The majority of the habitat on the Malheur identified as wolverine habitat by the listing document occurs in existing wilderness or unroaded areas under all alternatives
4. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

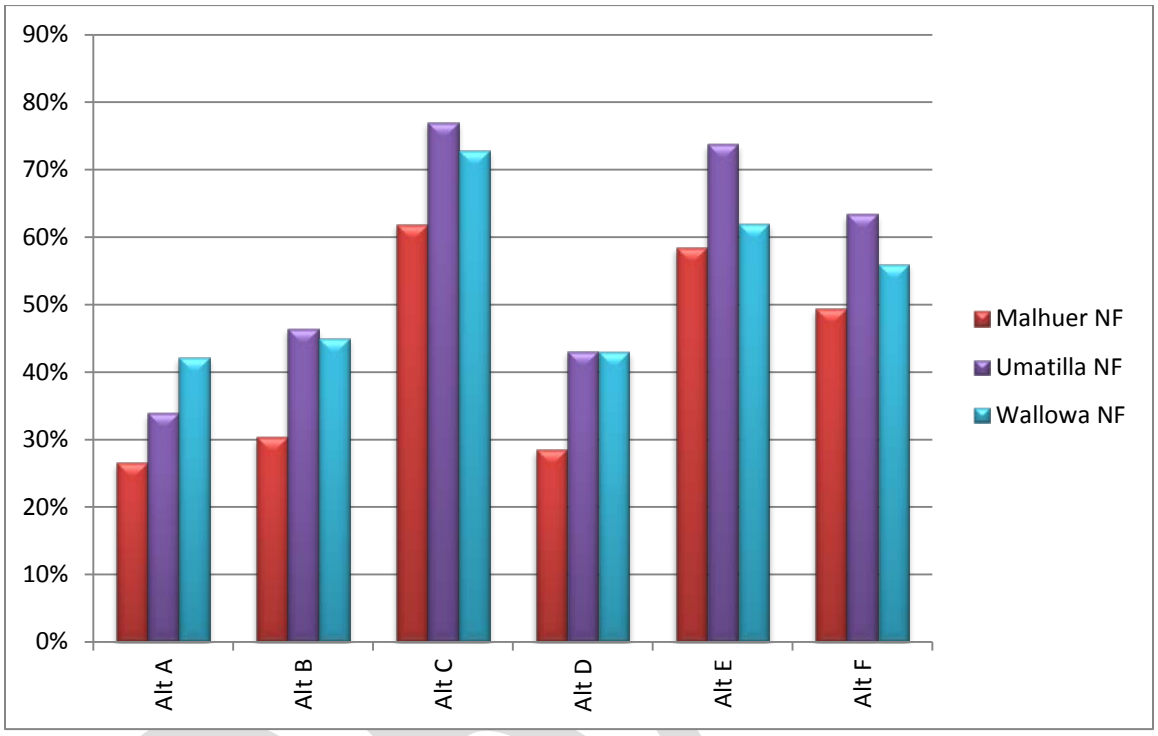


Figure 3x-Wolverine. Percent of source habitat for the North American wolverine by alternative and by national forest that occurs in management areas with an open route density of less than 1.5 miles per square mile

Umatilla National Forest

The wolverine is listed as suspected on the Umatilla National Forest (Table 1) but currently there is no evidence to indicate that the forest contains occupied habitat. Snow tracking surveys conducted in the analysis area during the early 1990s and winter 2011 (Sharps Ridge route) for wolverine, fisher, American marten, and lynx have resulted in no suspected wolverine tracks. There have been no sightings of this species on the Umatilla National Forest. Similar to the Malheur (Table 3x-DEN), 96 percent of the watersheds on the Umatilla had zero to low (1-600 acres) amounts of denning habitat (Wales et al. 2011) with only 4 percent having moderate amounts and there were no watersheds with high amounts (> 1400 acres). Unlike the Malheur National Forest, 87 percent of the watersheds on the Umatilla National Forest have no denning habitat. This would suggest that it would be highly unlikely that the Umatilla National Forest would support a breeding population of wolverines and that occurrence on this Forest would in all likelihood represent extreme dispersal events that are not representative of self-sustaining populations as suggested by Aubry et al. (2007).

All alternatives incorporate standard WLD-HAB-6 S-1 which prohibits management activities near denning sites; however it is extremely unlikely that management actions would occur in the area and

during the time of denning (see discussion under the Malheur National Forest). There is a wider spread between alternatives in reducing over the snow travel on the Umatilla and overall there is less area on the forest open to OSVs (Table 3x-OSV). Still, Alternative C reduces OSV suitability the most, with Alternatives E and F, ranking second for improving winter habitat effectiveness for the wolverine.

Because the Umatilla National Forest is thought to be unoccupied, it is not expected that individual wolverines would be affected by implementing any of the management alternatives. All alternatives are managing habitats towards HRV and as mentioned under the Canada Lynx, the cold forest is relatively close to what occurred historically. Currently, the overall permeability of the planning area for wolverine was rated as moderate to high; meaning in all likelihood wolverine mobility is not restricted (Wales et al. 2011). There is potential for wolverines from the Rocky Mountain population to enter Oregon from Idaho, Wyoming, or Montana. Although individuals may be impacted, overall management direction of any of the alternatives would contribute to habitat conditions for viability and persistence of this species.

Based on this analysis it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. According to the proposed listing document "…, *the best scientific and commercial information available indicates that only the projected decrease and fragmentation of wolverine habitat or range due to future climate change is a threat to the species now and in the future. The available scientific and commercial information does not indicate that other potential stressors such as land management, recreation, infrastructure development, and transportation corridors pose a threat to the DPS*."
2. Currently there are no known breeding individuals occupying the Umatilla and there is very little habitat identified as potential denning habitat.
3. The majority of the habitat on the Umatilla identified as wolverine habitat by the listing document occurs in existing wilderness or unroaded areas under all alternatives
4. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Wallowa-Whitman National Forest

There have been several unconfirmed sightings reported periodically in numerous areas on the Wallowa-Whitman National Forest. Sightings are mostly from wilderness, or more remote, high-elevation areas. Formal winter track surveys for wolverine were conducted during the winters of 1991 through 1994 but did not detect wolverines. Currently the Wallowa-Whitman National Forest is working cooperatively with The Wolverine Foundation and several other partners on a systematic survey for wolverine in and around the Eagle Cap Wilderness. The survey is utilizing remote cameras, snow tracking, and aerial surveys. Recently three wolverines were confirmed in the Wallowa Mountains of Northeast Oregon (Magoun et al. 2011).

Currently there are no confirmed denning areas of wolverines on the Wallowa-Whitman National Forest. Unlike the Malheur and Umatilla National Forests, the Wallowa-Whitman however actually has watersheds that were categorized as having high amounts of denning habitat (Table 3x-DEN). Wales et al. (2011) determined that 18 percent of the watersheds had moderate amounts of denning habitat while at least 10 percent had high amounts (> 1400 acres). Less than 58 percent of the watersheds had no denning habitat. As suggested by Mogoun et al. (2011), it is possible that the Wallowa-Whitman National Forest supports a small breeding population of wolverines and that their occurrence on this Forest may not represent extreme dispersal events as suggested by Aubry et al. (2007). Wales et al. (2011) determined

that the watersheds with the greatest amount of potential denning habitat are all in the Wallowa Mountains (Eagle Creek, Upper Wallowa Creek, Upper Imnaha River, and the Minam River) which would align with the recent documentation of wolverines on the Wallowa-Whitman National Forest (Mogoun et al. 2011)

All alternatives incorporate standard WLD-HAB-6 S-1 which prohibits management activities near denning sites; however it is extremely unlikely that management actions would occur in the area during the time of denning (see discussion under the Malheur National Forest). There is a wider spread between alternatives in reducing over the snow travel on the Wallowa-Whitman and overall there is less area on the forest open to OSVs (Table 3x-OSV). Still, Alternative C reduces OSV suitability the most, with Alternatives E and F, being the next best for improving winter habitat effectiveness for the wolverine.

Because the Wallowa-Whitman National Forest is thought to be occupied, it is possible that individual wolverines could be disturbed by implementing any of the management alternatives. All alternatives however are managing habitats towards HRV and as mentioned under the Canada Lynx, the cold forest is relatively close to what occurred historically. Currently, the overall permeability of the planning area for wolverine was rated as moderate to high; meaning in all likelihood wolverine mobility is not restricted (Wales et al. 2011). There is potential for wolverines from the Rocky Mountain population to enter Oregon from Idaho, Wyoming, or Montana. Although individuals may be impacted, overall management direction of any of the alternatives would contribute to habitat conditions for viability and persistence of this species.

Based on this analysis it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. According to the proposed listing document "*…, the best scientific and commercial information available indicates that only the projected decrease and fragmentation of wolverine habitat or range due to future climate change is a threat to the species now and in the future. The available scientific and commercial information does not indicate that other potential stressors such as land management, recreation, infrastructure development, and transportation corridors pose a threat to the DPS.*"
2. Wolverines currently occupy the Wallowa-Whitman however breeding has not been documented even though there are watersheds that are estimated to have high amounts of potential denning habitat.
3. All of the habitat on the Wallowa-Whitman identified as wolverine habitat by the listing document occurs in existing wilderness or unroaded areas under all alternatives
4. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on wolverine

The wolverine has circumboreal distribution. In North America, it extends across Canada and Alaska, and uses forested and non-forested environments. In the western U.S., they are known to occur in Washington, Idaho, Montana and Wyoming. Wisdom et al. (2000) estimated a 14 percent increase in source habitat within the Columbia River Basin with over 80 percent of the watersheds in the Blue Mountain ERU (6) showing an increase of more than 100 % in source habitat compared to historical. Raphael et al. (2001) evaluated wolverine habitat across the Columbia Basin and showed that likely better habitat for wolverine occurred in the northern Blue Mountains than the southern parts (e.g. the Malheur National Forest).

Since most wolverine habitat is found on remote, high-elevation Forest Service lands, few cumulative effects are expected from lands under private, state or other federally administered lands. Probably the greatest threat to wolverines is the ever increasing disturbance from activities such as snowmobiling, heli-skiing, cross-country skiing, and snow-shoeing. Recent advances in snowmobile technology capabilities has raised concerns about their ability to access previously isolated areas (Wisdom et al. 2000) where natal denning may be occurring . Although none of the alternatives attempt to expand this type of recreation in the future, it is anticipated that expansion of such activities will occur.

As with most species that inhabit high elevation habitats of the Blue Mountains, climate change is of concern, but more so with the wolverine. Spring snow cover, which has been shown to strongly correlate with wolverine denning locations and year-round movement, is also correlated to dispersal pathways across the landscape (Copeland et al. 2010; Schwartz et al. 2009). This bioclimatic niche (Copeland et al. 2010) is likely to continue to be strongly impacted by global climate change (Mote et al. 2005), threatening wolverine throughout their geographic distribution.

Woodland-Grass-Shrub Family/Woodland-Grass-Shrub Group

Striped Whipsnake (Washington only)

Life History and Habitat Description

Occurs in open brushy country; desert scrub, sagebrush flats, and mixed woodlands. Often found along the edges of rivers or ponds. *M. taeniatus* reaches the northern extent of its range in Washington. Evidence indicates the species was never common. Little is known about the habitat requirements in Washington. The Washington occurrences are limited to the central area of the Columbia Basin (Figure SW-1) that receives the least precipitation (0-20.3 cm annually) and tends to have shrub dominated communities rather than shrub-steppe. The areas of Grant County where they occur have relatively undisturbed shrub-steppe habitat with a low cover of cheatgrass (Washington Herp Atlas 2009).

The closest known occurrence to the Umatilla National forest are the historical occurrences documented in 1922 three miles east of Walla Walla (Figure SW-2). Hallock (Hallock 2006) used orthophotos to search for habitat attributes surrounding each of the known locations and concluded that no suitable habitat currently existed for the Walla Walla location. Most of the habitat had been converted to agriculture and it was extremely unlikely that the whipsnake occurred in the area (*ibid*). All of Washington occurrences are below 1500 feet elevation which may be a result of egg-laying requirements of reptiles that are the primary prey species (*ibid*). The vast majority of lands at or below this elevation in the Columbia Basin have been converted to agriculture or inundated by the reservoirs for the Columbia Basin Irrigation project.

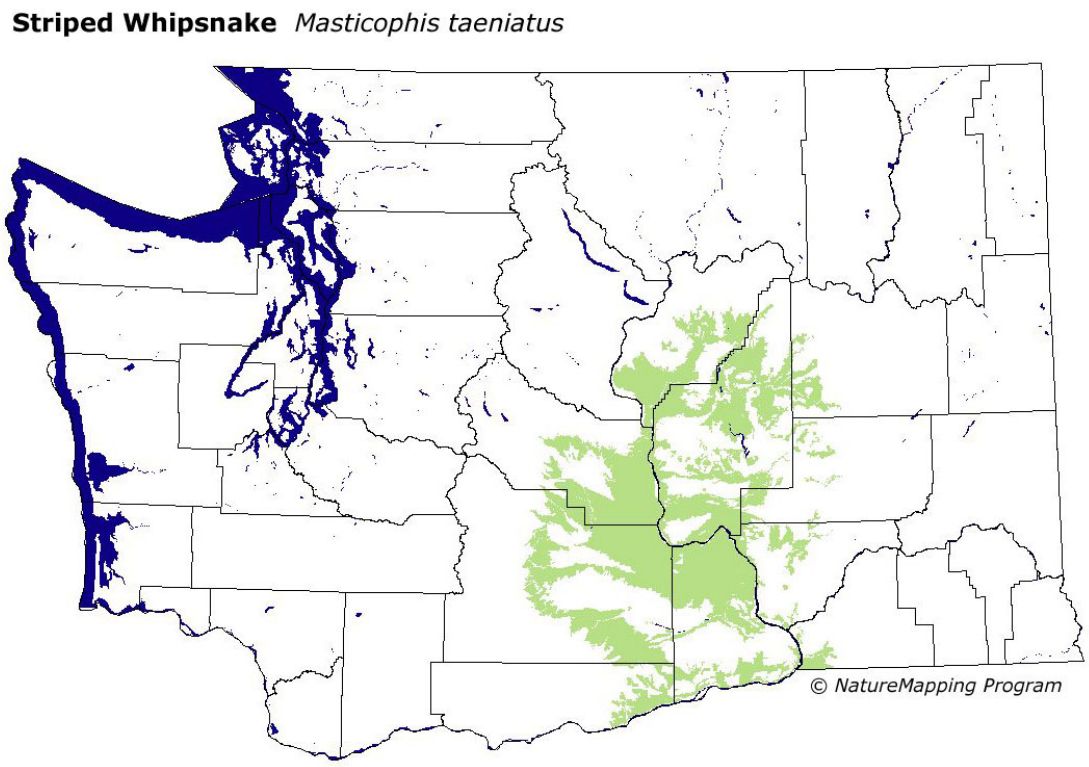


FIGURE SW- 1: ESTIMATED RANGE OF THE STRIPED WHIPSNAKE IN WASHINGTON BASED ON HABITAT (FROM HTTP://NATUREMAPPINGFOUNDATION.ORG/NATMAP/MAPS/WA/REPTILES/WA_STRIPED_WHIPSNAKE.HTML)

Risks

Road mortalities from vehicles have been documented (Hallock 2006). Grazing and other activities that would result in changes to shrub structure (i.e. removal of lower branches) is a concern for both this species and the snakes' main prey (*U.stansburiana*) (*ibid*). Additionally grazing and other activities that may crush mammal burrows may impact this species as they often use these burrows for shelter.

Additionally, there is a possibility that a loss of sagebrush and native grasslands may occur in the planning area due to conversion to exotic vegetation due to many forces, some not related to forest management. Invasion of exotic vegetation, altered fire regimes, road development, and use, mining, energy development, climate change, encroachment of pinyon-juniper woodlands, intensive grazing by livestock, and conversion to agriculture, to urban use, and to non-native livestock forage all have contributed to the continuing demise of the sagebrush ecosystem (Bachelet et al. 2001; Bunting et al. 2003; Knick 1999; Miller and Eddleman 2000; Noss et al. 1995; Tausch et al. 1995).

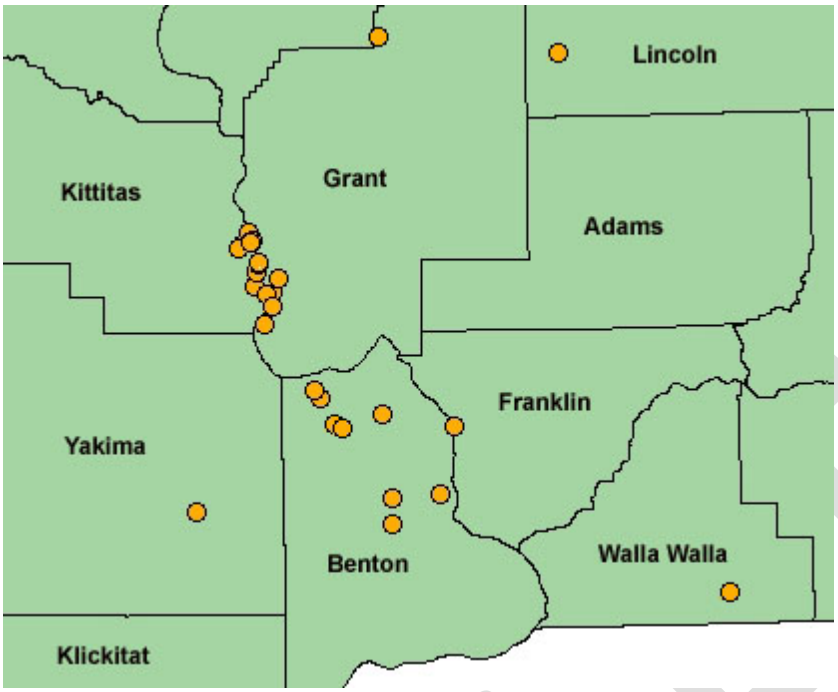


FIGURE SW- 2: KNOWN LOCATIONS OF THE STRIPED WHIPSNAKE IN WASHINGTON

Determination of Effects

In Oregon, striped whipsnake populations are considered secure, whereas in Washington they are considered critically imperiled (NatureServe 2012). A portion of the Umatilla National Forest extends into southeast Washington where this species is considered sensitive by the Forest Service. As such, only the Umatilla National Forest is addressed for this species.

The striped whipsnake is within the Family and Group Woodland/Grass/Shrub. This species is best represented by the focal species of lark sparrow and sage thrasher. The viability models for these focal species projected little change in the abundance of shrub dominated communities on NFS lands. Sagebrush steppe is identified as a special habitat in the forest plan, with a desire of no net loss and at least 70 percent with an understory of native species, resulting in conditions that are sustainable and resilient to disturbance, meaning that they are capable of recovering to their potential community without intervention after a disturbance. The other 30 percent of the landscape would include areas of juniper encroachment, non-sagebrush shrub lands, annual grasslands, and non-native perennial grasslands that potentially could be re-habilitated and enhanced as sagebrush habitat. This would be true no matter which action alternative is being evaluated.

Table Focal-1: Level of viability concern on the Umatilla National Forest currently and under each alternative for the sage thrasher and lark sparrow

	Level of viability concern						
		Alternative					
Focal Species	Current	A	B	C	D	E	F
Sage thrasher	M	M	M	M	M	M	M
Lark sparrow	L	L	L	L	L	L	L

Overall the Forest Service manages little of this habitat and as demonstrated in Figure SW-3 National Forest land does not encompass any habitat that meets the limitations described by Hallock (2006) for Washington. Although the ISSSSP list indicates that this specie is suspected to occur on the Umatilla

National Forest, the current information available would indicate that this is extremely unlikely. Even if habitat still occurred near the 1922 documented occurrence three miles east of Walla Walla, it would still be below 1500 feet in elevation and at least nine miles from the National Forest.

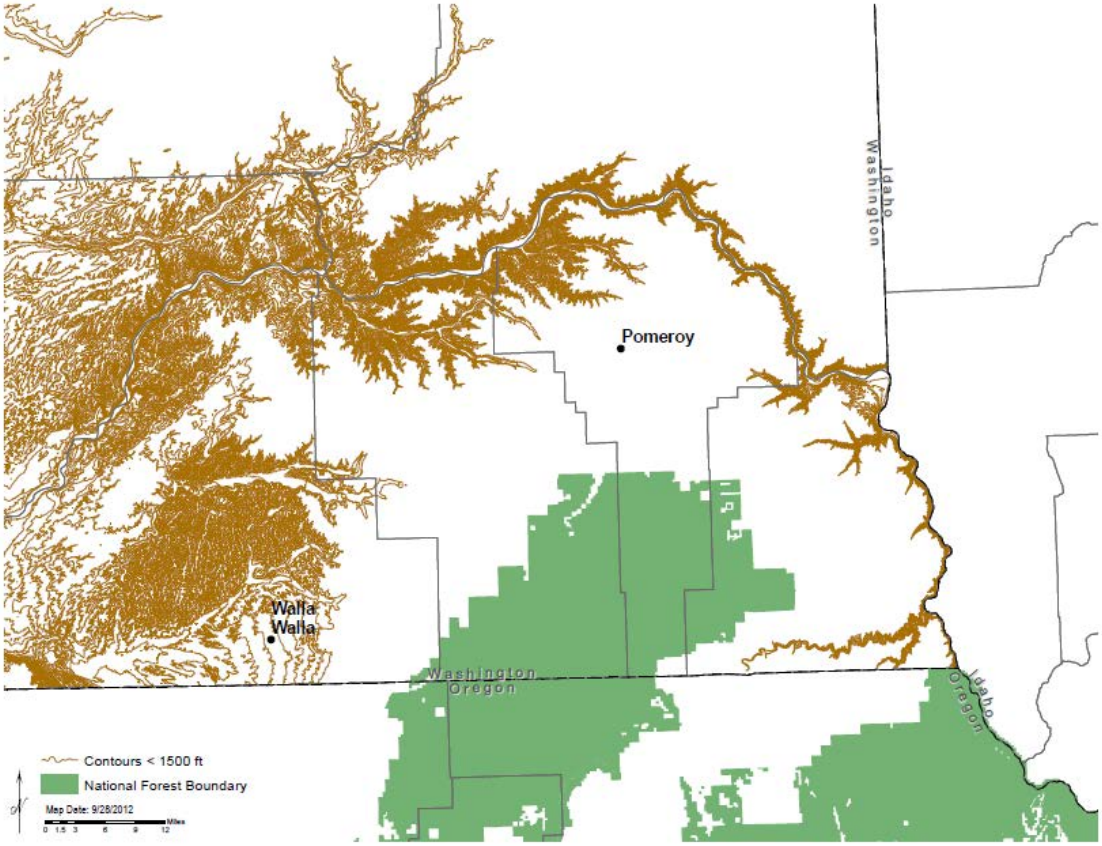


FIGURE SW- 3: NATIONAL FOREST IN RELATION TO ELEVATION LIMITATIONS OF THE STRIPED WHIPSNAKE IN WASHINGTON

Umatilla National Forest

Although the striped whipsnake is listed as suspected to occur on the Umatilla National Forest given the above analysis this appears extremely unlikely and therefore proposed management activities under any alternative will have **no impact** on individuals, their habitat, or viability of the population or species.

Because:

1. This species is only sensitive in Washington as striped whipsnake populations are considered secure in Oregon.
2. The best scientific information available indicates that neither this species nor its habitat would be expected to occur on the Umatilla National Forest in Washington.

Cumulative Effects on species

Since the species is not expected to occur on the forest cumulative effects are not addressed.

Spotted Bat

Life History and Habitat Description

According to the Western Bat Working Group species account (Chambers and Herder 2005) the spotted bat has been found from below sea level to 2700 m elevation and occurs from arid, low desert habitats to high elevation conifer forests. Prominent rock features appear to be a necessary feature for roosting. This species has been found in vegetation types that range from desert to sub-alpine meadows, including desert-scrub, pinyon-juniper woodland, ponderosa pine, mixed conifer forest, canyon bottoms, rims of cliffs, riparian areas, fields, and open pasture. Roost sites are cracks, crevices, and caves, usually high in fractured rock cliffs.

Winter range and hibernacula are unknown for most its range, though the species has been captured year-round in the southern part of its range and it may be year-round in central Oregon with the exception of December and January.

Spotted bats likely breed in late summer with females giving birth to a single pup in early summer (May or June). Postpartum females have been captured from June to late August. They appear to be solitary animals but occasionally roost or hibernate in small groups. Roost sites are cracks, crevices, and caves, usually high in fractured rock cliffs. In British Columbia and Arizona, bats showed high roost fidelity, using the same roosts nightly.

This species has been found in vegetation types that range from desert to sub-alpine meadows, including desert-scrub, pinyon-juniper woodland, ponderosa pine, mixed conifer forest, canyon bottoms, rims of cliffs, riparian areas, fields, and open pasture. During summer, bats may travel from roosts in desert-scrub to forage in high elevation meadows, returning to roosts within an hour of dawn. Males and females are capable of long distance (20 km in British Columbia, 80 km in Arizona) and rapid (50 kph) flight, thus foraging ranges can be large. Spotted bats avoided conspecifics when foraging in British Columbia, probably to reduce competition for food resources. In Arizona and Oregon, conspecifics did overlap when foraging. In British Columbia, bats foraged within 6-10 km of day roosts, maintaining exclusive foraging areas. In Arizona, spotted bats traveled up to 40 km from roosts, and night roosted for 1 to 3 hours in or away from their day roost. Bats in Oregon and Arizona did not appear to be as predictable in their foraging locations as in British Columbia, but predictability of foraging may change over seasons. Early in summer, foraging patterns may be restricted to a few locations with abundant prey. As prey become more plentiful later in summer, spotted bats may be able to acquire food in shorter foraging periods across more locations.

Threats

Little is known about possible threats to spotted bats because of the lack of knowledge concerning this species. Since the spotted bat roosts in remote locations, threats to roosts seem unlikely. However, recreational rock climbing may cause impacts in some areas. Dam construction that inundates high cliffs and canyons may remove roost locations. Urbanization in some areas (for example, mesas in the Sierra foothills in California, areas around Bend and Redmond, Oregon) may affect roosting habitat since spotted bats appear to roost in some of these areas. Collection of spotted bats by humans and use of pesticides that may bio accumulate in bats or kill prey may also be threats. In Montana, coal bed methane development creates toxic ponds that may harm animals. Loss of foraging habitat (grazing of meadows and desert-scrub, conversion of desert wash vegetation, or conversion of native grasslands to cheatgrass or other invasive species) may reduce food availability. In the southwest, loss of accessible, open water that has been introduced in many areas for grazing livestock may impact bats because of the bats' high rates of evaporative water loss. As with most bat species, threats include habitat destruction or alteration, disturbance, sensitivity to pesticides and other pollutants, and overexploitation.

Chambers et al. (2011) explains that foraging areas could be affected by a variety of activities, including overgrazing that may reduce insects that these bats depend upon, loss of water sources such as livestock ponds during times of drought, and the development of wind-energy installations. Additionally in AZ, they found maternity roosts were remote, difficult to access and within protected areas thus not necessarily at risk.

Determination of Effects

Lark sparrow was the focal species modeled for this family and group. The lark sparrow model projected little change in the abundance of source habitat on NFS lands (See table focal-1). The viability outcome for the lark sparrow changed little from historical on all three national forests and therefore the concern for viability is low. As pointed out by Wales et al. (2011) the pallid bat was also chosen as focal species for this group, largely due to their high dependence on unique and not necessarily widespread roosting sites. This would also be true of the spotted bat, but as indicated above, roosts for this species are normally very remote and not subject to alteration by most management activities of the Forest Service. In any case alternatives B, C, E, and F contain the following plan component- Bat maternity and roost sites should not be disturbed (WLD-HAB-18 G-7) providing further protection for roost sites. Additionally Alternative C has a standard to survey for the presence of all bats prior to potentially disturbing activities (WLD-HAB-23 *New*). Alternatives B, C, D, E, and F have a plan component to protect (within 1200 feet) known nesting sites of sensitive species (WLD-HAB-6 S-1).

The spotted bat is considered apparently secure (NatureServe 2012) globally (G4) and nationally it is considered vulnerable or apparently secure (N3/N4). The Oregon population is considered imperiled (S2) and the Washington population is considered vulnerable (S3).

Malheur National Forest

The spotted bat is not known or suspected to occur on the Malheur National Forest (Table 1). Therefore implementation of any of the alternatives would result in **no impact** on individuals, their habitat, or viability of the population or species.

Umatilla National Forest

The spotted bat is not known or suspected to occur on the Umatilla National Forest (Table 1). Therefore implementation of any of the alternatives would result in **no impact** on individuals, their habitat, or viability of the population or species.

Wallowa-Whitman National Forest

Given the results of the focal species assessment model, the fact that roosting habitat is usually remote and there are plan components that address bat roost and nesting sites, and that the quality of habitat is not expected to be reduced from implementing the plan under any alternative it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Roost sites appear to be highly remote and inaccessible.
2. The focal species assessment model for this group indicated a low concern for viability within the plan area.
3. The spotted bat is a highly mobile bat and could easily disperse throughout the planning area and although it is still considered imperiled in Oregon it is widely distributed throughout the west.

4. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.

5. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

There is relatively little known concerning the ecological information about this species, making it difficult to determine potential cumulative effects. It is not known to be affected by white-nose syndrome (NatureServe 2012).

Pallid Bat

Life History and Habitat Description

According to the Western Bat Working Group species account (Rambaldini 2005) the pallid bat inhabits low elevation (< 1,830 m / 6,000 feet) rocky arid deserts and canyon lands, shrub-steppe grasslands, karst formations, and higher elevation coniferous forests (> 2,100 m / 7,000 feet). It is most abundant in xeric ecosystems, including the Great Basin, Mojave, and Sonoran Deserts. Day and night roosts include crevices in rocky outcrops and cliffs, caves, mines, trees (e.g., basal hollows of coast redwoods and giant sequoias, bole cavities of oaks, exfoliating ponderosa pine and valley oak bark, deciduous trees in riparian areas, and fruit trees in orchards), and various human structures such as bridges (especially wooden and concrete girder designs), barns, porches, bat boxes, and human-occupied as well as vacant buildings. They forage over open shrub-steppe grasslands, oak savannah grasslands, open ponderosa pine forests, talus slopes, gravel roads, lava flows, fruit orchards, and vineyards.

Antrozous pallidus is somewhat less associated with mountains and are species more of drier valleys, plains, and foothills of moderate to low relief and elevation in the Columbia River Basin (Marcot 1996). Bridge night roosting does appear to be widespread for *A. pallidus* and may be a reasonable indicator of the presence/absence of this species in an area (Barbour and Davis 1969; Lewis 1994; Pierson et al. 1996)(from Pierson et al. 1996)

Threats

Pallid bats tend to roost gregariously and their relative sensitivity to disturbance makes them vulnerable to mass displacement. Roosts and hibernacula can be damaged or destroyed by vandalism, mine closures and reclamation, recreational activities such as rock climbing, forestry practices such as timber harvest, and, where man-made structures are occupied, demolition, modification, chemical treatments, or intentional eradication and exclusion. Maternity colonies and hibernating bats are especially susceptible to disturbance. Loss or modifications of foraging habitat due to prescribed fire, urban development, agricultural expansion, and/or pesticide use pose potential threats.

Determination of Effects

As pointed out by Wales et al. (2011) the pallid bat was chosen as focal species for this group, largely due to their high dependence on unique and not necessarily widespread roosting sites. However they were not modeled due to not having sufficient knowledge to adequately map roosting habitat and develop a model at a forest wide scale. Lark sparrow was another focal species that was modeled for this family and group. The lark sparrow model projected little change in the abundance of source habitat on NFS lands (see table Focal-1). The viability outcome for the lark sparrow changed little from historical on all three national forests and therefore the concern for viability is low. Although loss or modification of foraging habitat

can pose a potential threat, the focal species assessment indicates that this should not be the case at the scale of the forest under any alternative. Therefore, the most important concern for this species would be any change in the abundance of roosting structures.

As indicated above, this species uses a wide variety of roosting structures that normally are not subject to alteration by most management activities of the Forest Service. In any case alternatives B, C, E, and F contain the following plan component- Bat maternity and roost sites should not be disturbed (WLD-HAB-18 G-7) providing further protection for roost sites. Additionally Alternative C has a standard to survey for the presence of all bats prior to potentially disturbing activities (WLD-HAB-23 *New)*. Alternatives B, C, D, E, and F have a plan component to protect (within 1200 feet) known nesting sites of sensitive species (WLD-HAB-6 S-1). Alternatives B, C, E, F have standards and/or guidelines protecting large (>=21" DBH) trees and snags (OF-1 G-59, WLD-HAB-12 S-7) which should further protect potential tree roosts of this species.

The pallid bat is considered secure (NatureServe 2012) both globally (G5) and nationally (N5). The Oregon population is considered imperiled (S2) and the Washington population is considered imperiled or vulnerable (S2/S3).

Malheur National Forest

The pallid bat is not known or suspected to occur on the Malheur National Forest (Table 1). Therefore implementation of any of the alternatives would result in **no impact** on individuals, their habitat, or viability of the population or species.

Umatilla National Forest

The pallid bat is not known or suspected to occur on the Umatilla National Forest (Table 1). Therefore implementation of any of the alternatives would result in **no impact** on individuals, their habitat, or viability of the population or species.

Wallowa-Whitman National Forest

Given the results of the focal species assessment model, the fact that this species uses a wide variety of roosting habitat, plan components exist that address bat roost and nesting sites, and that the quality of habitat is not expected to be reduced from implementing the plan under any alternative it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Roosts and hibernacula appear to be highly diverse in structure, including man-made structures such as bridges and dwellings.
2. The focal species assessment model for this group indicated a low concern for viability within the plan area.
3. The pallid bat is a highly mobile bat and could easily disperse throughout the planning area and although it is considered imperiled in Oregon it has a large range throughout western North America.
4. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
5. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

Similar threats to roosts and hibernacula as described for forest service lands such as mine closures and reclamation, rock climbing and timber harvest could and do occur on adjoining lands. Where man-made structures are occupied, demolition, modification, chemical treatments, or intentional eradication and exclusion has a higher probability of occurring.

Woodland-Grass-Shrub Family/Juniper Woodland Group

Ash-Throated Flycatcher (Washington only)

Life History and Habitat Description

Ash-throated Flycatchers are fairly common, and in some places quite abundant, throughout most of the western United States and Mexico. The breeding range extends as far north as Oregon and Washington, as far east as central Texas, and as far south as central Mexico. They winter in Central America and southern Mexico.

Ash-throated Flycatchers are generalists when it comes to breeding habitat. They breed in chaparral, mesquite thickets, oak scrub, dry plains spotted with trees or cacti, deserts, and open deciduous and riparian woodlands (Cardiff and Dittman 2002). It can be found in a wide variety of habitats in Oregon. East of the Cascades they use semi-arid slopes and canyons with large western juniper (Marshall et al. 2003, Reinkensmeyer 2000), sometimes with an understory of sagebrush, bitterbrush, and/or rabbitbrush (Marshall et al. 2003). Washington is the northern distributional limit for this species and breeding birds are usually associated with drier woodlands dominated by Garry oak (Cardiff and Dittman 2002, Birdweb 2005) found in the south central portion of the State (Figure AF-1).

Ash-throated flycatchers are opportunistic nesters, using almost any natural or artificial cavity, size permitting and ≥0.3 m above ground. As a secondary cavity nester they nest primarily in natural cavities (usually in dead portions of trunks and larger branches of trees, large shrubs, and in columnar cacti) or woodpecker cavities (Cardiff and Dittman 2002). They also use nest boxes as well as cavities in other human-made structures such as wooden posts or hollow metal poles.

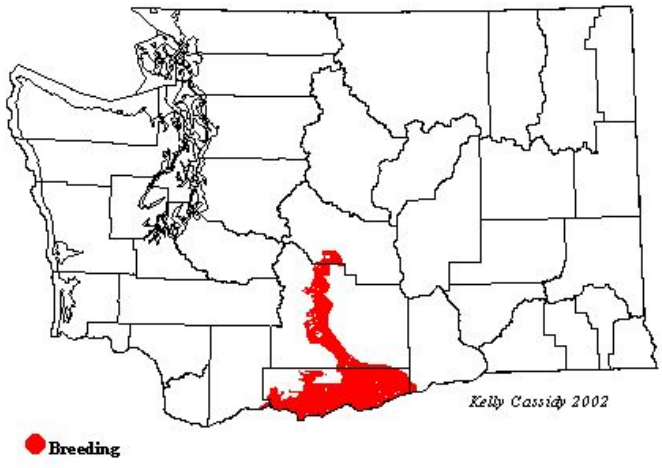


FIGURE AF- 1: BREEDING RANGE OF ASH-THROATED FLYCATCHER FROM WWW.BIRDWEB.ORG/BIRDWEB/BIRD/ASH-THROATED_FLYCATCHER

Within these general habitats the main necessity is the presence of shrubs or trees with trunks or branches thick enough to serve as nest-cavity substrates and the presence of at least one woodpecker species to excavate cavities; or the presence of trees, shrubs and/or artificial structures that provide natural or artificial cavities of sufficient size and densities to support population of flycatchers adjacent to relatively dry and open woodland or scrub habitat for foraging (Cardiff and Dittman 2002). In many situations, nests are located in "woodland" corridors along washes, streams, and canyon bottoms, or at the edge of more extensive, denser woodland or forest habitats (where nest sites more readily available) with adjacent foraging territories of more homogeneous, open desert scrub or dense semiarid scrub habitats (e.g., chaparral, coastal sage scrub, or sagebrush [*Artemisia* spp.]). Sufficient shrub/forb/grass cover is needed to support the insect prey-base (Zwartjes, et al.2005).

Threats

Ash-throated flycatcher was selected as focal for the Woodland group because it has the widest distribution throughout the planning area and covers the major risk factors well. Ash-throated flycatchers nest in tree cavities and may be affected by livestock grazing.

In woodlands, grazing may negatively affect ash-throated flycatchers through (1) the loss of snags due to changes in the natural fire regime and the occurrence of catastrophic fire, and (2) decreased availability of insects (Zwartjes et al. 2005).

Determination of Effects

In Oregon, ash-throated flycatcher populations are considered secure, whereas in Washington they are considered imperiled (NatureServe 2011). A portion of the Umatilla National Forest extends into southeast Washington (representing 1 percent of the state- WDFW 2005) where this species is considered sensitive by the Forest Service. As such, only the Umatilla National Forest is addressed for this species.

A focal species assessment model was developed and analyzed for ash-throated flycatchers across each of the national forests (see Wales et al. 2011). Source habitat was defined as Juniper habitat >15" in diameter. Habitat quality factors included in the model were snag density (calculated as % of source habitat with tree size >=21") and grazing. Historically the viability outcome for this flycatcher was estimated to be an A, while the current outcome was modeled to be primarily a D. Loss of large tree juniper habitat is the primary reason for a decline in the viability outcome.

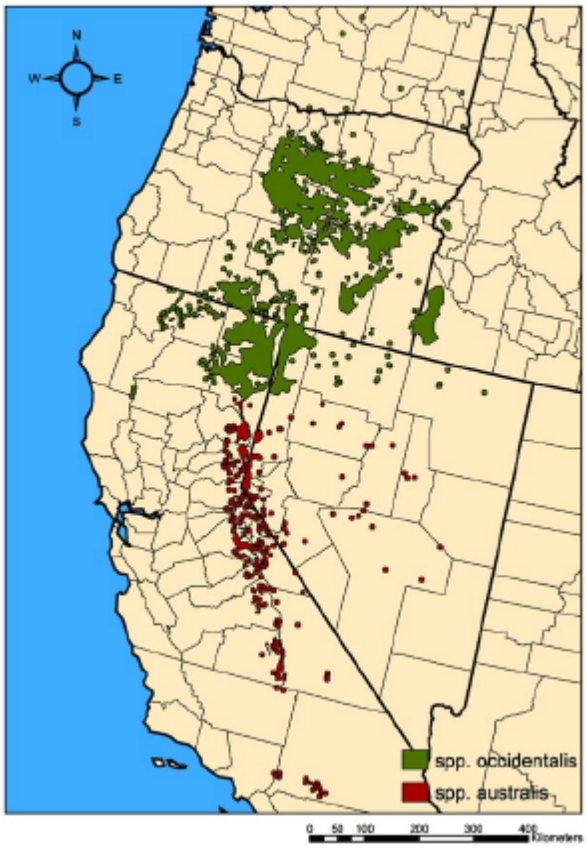
Table AF-1: Level of viability concern on the Umatilla National Forest currently and projected for each alternative.

Focal Species	Current	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
Ash-throated Flycatcher	H	M/H	M/H	M/H	M/H	M/H	M/H

The above assessment probably has limited applicability to the Washington portion of the Umatilla National Forest due to the lack of Juniper. Dealey (1990) indicates Western juniper stands, more limited in size extend up the valleys and foothills of the southern Blue Mountain region. Miller et al. (2005) indicate that small groups or individuals are scattered sparsely through the northern Blue Mountains into Washington (figure 1). Shaughnessy and O'neil (2001) do not recognize juniper woodland habitat as occurring in Washington, which is also supported by the vegetation data used for plan revision analysis. Typically a bird of open, arid habitats breeding ash-throated flycatchers are restricted to a small band of Garry oak and streamside woodlands in the southeastern Cascade foothills (Birdweb 2005) of Washington and do not occur on the Umatilla.

The Forest Service manages little potential habitat for this species on the Umatilla National Forest and although the species is documented for the Washington portion of the Forest, in all likelihood it was a migrating bird.

Figure 1. Distribution map of western juniper (*Juniperus occidentalis* var. *occidentalis*) and Sierra juniper (*J. occidentalis* var. *australis*) (derived from Griffin and Critchfield 1972, Charlet 1996, Gedney et al. 1999, and USGS 1:250,000 maps; developed by Steve Petersen, Department of Rangeland Ecology and Management, Oregon State University, Corvallis, Oregon).



None of the alternatives propose management in the juniper/sagebrush transition zone that is expected to negatively affect this species. In general, throughout the planning area (Blue Mountains), juniper source habitat is expected to improve through succession under all alternatives. Livestock grazing may occur, however grazing levels are considered moderate under all alternatives (RNG-5) and all alternatives are proposing to decrease the spread of exotic vegetation that might degrade the quality of these habitats. Livestock grazing effects are expected to have the lowest risk for this species under Alt. C (less grazing), and the highest risk under Alt. D (increased grazing). Additionally all alternatives provide protection for trees with nest cavities (WLD-HAB-11 G-1) and have a standard to limit excessive human activity during the breeding season (WLD-HAB-6 S-1).

Umatilla National Forest

Although the ash-throated flycatcher is considered a priority 3 species in Washington it was not identified for the Blue Mountain Ecoregion (WDFW 2008, WDNR 2009). Dealy (1990) indicates that although limited western juniper stands extend up the valleys and foothills of the southern Blue Mountain region, only small groups or individuals are sparsely scattered throughout the northern Blue Mountains into Washington.

According to Shaughnessy and O'neil (2001), juniper woodland habitat does not occur in Washington, which is also supported by the vegetation data used for plan revision analysis. A the ash-throated flycatcher is restricted to a small band of Garry oak and streamside woodlands in the southeastern Cascade foothills (Birdweb 2005) and does not occur on the Umatilla.

Although the ash-throated flycatcher has been documented to occur on the Umatilla National Forest given the above it is highly unlikely that breeding individuals would occur on the forest in Washington and therefore proposed management activities under any alternative will have **no impact** on individuals, their habitat, or viability of the population or species.

Because:

1. Ash-throated flycatchers are migratory, so only breeding populations are considered sensitive.
2. This species is only sensitive in Washington as ash-throated flycatcher populations are considered secure in Oregon.
3. The best scientific information available indicates that breeding individuals of this species would not be expected to occur on the Umatilla National Forest in Washington.

Cumulative Effects on species

Since breeding individuals are not expected to occur on the forest cumulative effects are not addressed.

Woodland-Grass-Shrub Family/Woodland-Shrub Group

Gray Flycatcher (Washington only)

Life History and Habitat Description

The Gray Flycatcher is a common inhabitant of arid woodland and shrublands of the interior western United States in summer, preferring sagebrush and juniper (Sterling 1999). Woodland habitat includes mountain-mahogany, old-growth and mid-successional juniper, and open ponderosa pine with an understory of sagebrush or bitterbrush (Sterling 1999, Reinkensmeyer 2000). In Washington, gray flycatchers are found in open ponderosa pine–Garry oak (*Quercus garryana*)–Douglas fir (*Pseudotsuga taxifolia*) woodland with bare understory (Lavers 1975). It does extend into sagebrush in some parts of Washington, but mostly sticks to park-like Ponderosa pine stands lacking a shrub-layer, most of which have been logged or thinned, some multiple times (birdweb 2005). It is uncommon in the Okanogan valley and Okanogan Highlands and very rare in the Blue Mountains (NatureMapping Foundation 2012).

Gray Flycatchers were first recorded in Washington in 1970, and first found breeding here in 1972; since then, they have expanded their range considerably (figure GF-1), reaching southern British Columbia in 1986 (Cannings 1987). This rapid expansion may have been due to forest management practices that cleared understory and thinned stands of Ponderosa pine forests, creating the park-like habitat that Gray Flycatchers prefer (NatureMapping Foundation 2012).

This monogamous species sometimes occurs in loose colonies when habitat is favorable. In Ponderosa pine habitat, nests are typically placed on a large, horizontal branch, against the trunk. The female builds the nest, although the male sometimes helps. The nest is a bulky cup of loose grass, needles, bark, and other material, lined with plant down, feathers, and hair. The female incubates three to four eggs for 14 to 15 days. Both parents feed the young, which leave the nest at about 16 days. The parents continue to feed the young for another 14 days. Over much of their breeding range, they lay a second clutch after the first clutch fledges.

Gray Flycatchers migrate shorter distances than many of their relatives, wintering in southern Arizona, Baja California, and Mexico (Sterling 1999). They arrive in Washington at the end of April and leave in August.

Risks

Local increases in agriculture and cattle that enhance Brown-headed Cowbird populations may adversely affect nesting success of Gray Flycatchers (Sterling 1999).

Determination of Effects

The breeding population of the gray flycatcher is considered imperiled (S2B) in Washington, but globally it is considered secure (G5) and nationally it is considered secure (NB5) (NatureServe 2012). In Oregon, gray flycatcher populations are considered apparently secure (S4). Sterling (1999) reported that this flycatcher appears to be relatively common and increasing in western North America without special management efforts. A portion of the Umatilla National Forest extends into southeast Washington where this species is considered sensitive by the Forest Service. As such, only the Umatilla National Forest is addressed for this species.

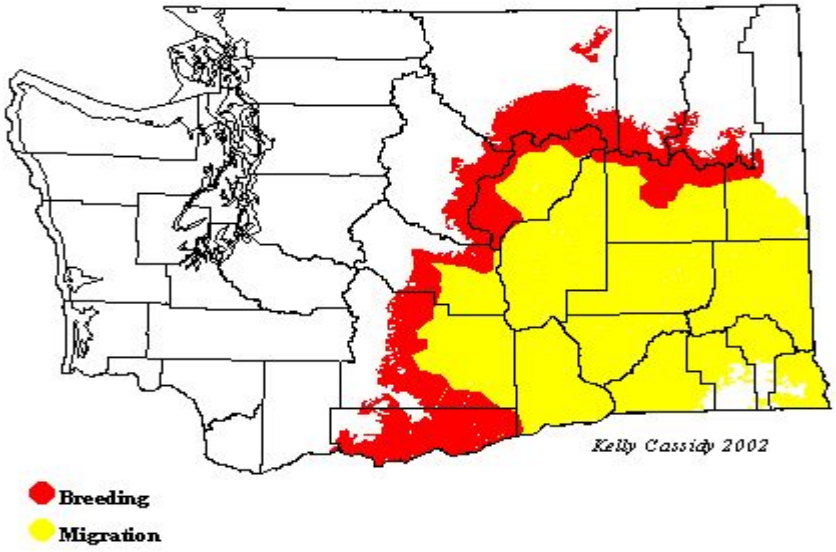


FIGURE GF- 2: BREEDING RANGE OF THE GRAY FLYCATCHER FROM WWW.BIRDWEB.ORG/BIRDWEB/BIRD

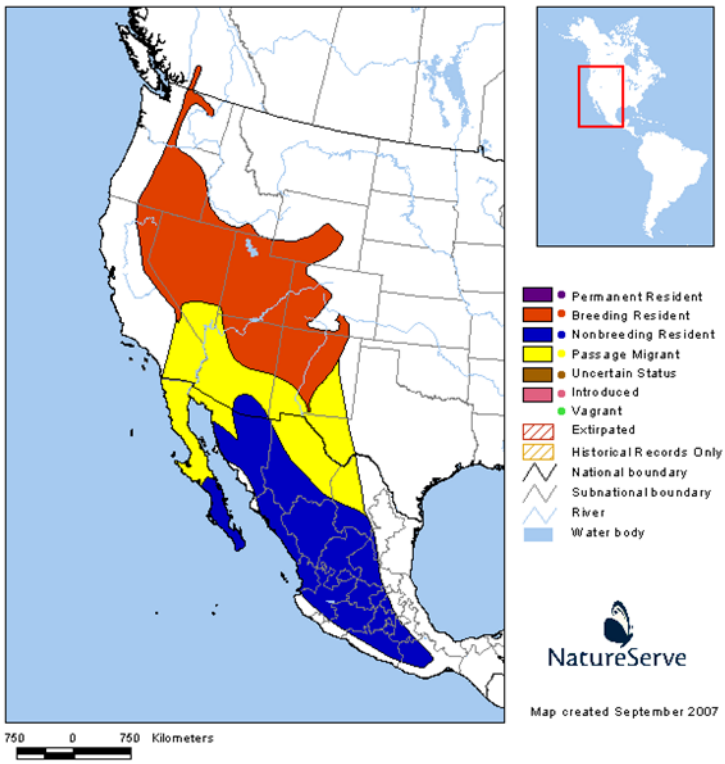
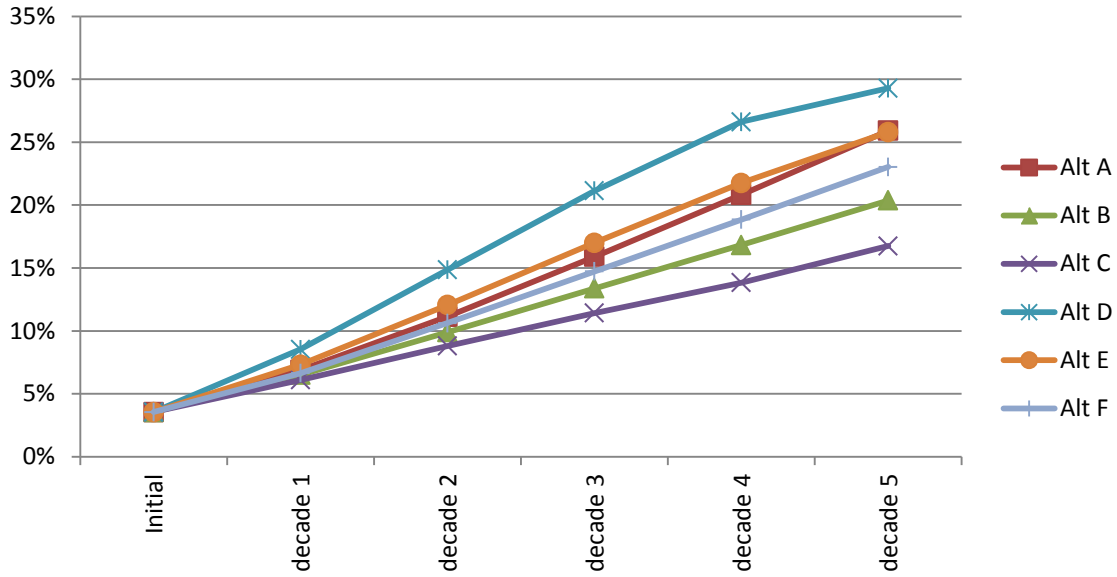


Figure GF- 2: Breeding range of the gray flycatcher

Throughout most of its range, the gray flycatcher is considered an obligate or semi-obligate species in the juniper woodlands (Balda and Masters 1980; Francis et al. 2011; Paulin et al. 1999; Pavlacky and Anderson 2004). The gray flycatcher is within the Family Woodland/Grass/Shrub, and Group Woodland/Shrub. The focal species for this group is the loggerhead shrike (USDA 2010) which was not modeled for alternative B (Wales et al. 2011). As previously demonstrated for the ash-throated flycatcher, juniper is extremely scarce in Washington (see figure 1) and therefore not a representative habitat for the gray flycatcher. Additionally, breeding individuals of this species in Washington are found in open ponderosa pine–Garry oak (*Quercus garryana*)–Douglas fir (*Pseudotsuga taxifolia*) woodland with bare understory (Lavers 1975). This habitat type is more likely represented by the white-headed woodpecker which represents the open ponderosa pine Forests. The viability models estimated large losses compared to the historical amount of large open ponderosa pine habitat within the Blue Mountains. However as demonstrated in figure WHWO-1, all alternatives indicate an

improvement in the amount of this source habitat on the Umatilla NF. It is also important to note that populations of the gray flycatcher appear to be expanding in Washington.

Figure WHWO-1: Percent of Source habitat on the Umatilla National Forest in relation to mid-point HRV by alternative for the white-headed woodpecker over the first five decades.



Umatilla National Forest

Gray flycatchers are known to occur on the Umatilla National Forest, but according to figure GF-1 and GF-2, these individuals would most likely have been migratory. According to Marshall et al. (2003) the gray flycatcher is less selective of habitat during migration, often being found in riparian areas. The gray flycatcher is considered a priority 3 species in Washington but it was not identified for the Blue Mountain Ecoregion (WDFW 2008; WDNR 2009) The gray flycatcher has not been documented to occur on the Umatilla National Forest and given the above it is highly unlikely that breeding individuals would occur on the forest in Washington and therefore proposed management activities under any alternative will have **no impact** on individuals, their habitat, or viability of the population or species.

Because:

1. Gray flycatchers are migratory, so only breeding populations are considered sensitive.
2. This species is only sensitive in Washington as gray flycatcher populations are considered apparently secure in Oregon.
3. The best scientific information available indicates that breeding individuals of this species would not be expected to occur on the Umatilla National Forest in Washington.

Cumulative Effects on species

Since breeding individuals are not expected to occur on the forest cumulative effects are not addressed.

Woodland-Grass-Shrub Family/Woodland-Shrub Group

Green-Tailed Towhee

Life History and Habitat Description

Green-tailed towhees breed in a range of mixed-species shrub communities, including open shrubsteppe, montane shrubland, and successional growth in disturbed coniferous forest (Dobbs et al. 1998, Hutto and Young 1999). They prefer areas of high shrub species diversity in sagebrush (*Artemisia*)-dominated communities, in foothill shrublands, and within open pinyon (Pinus)-juniper (*Juniperus*) woodland (Wiens and Rotenberry 1981, Sedgwick 1987, Knopf et al. 1990, Berry and Bock 1998). The green-tailed Towhee reaches its northernmost range limit in the Blue Mountains of Washington (figure GT-1) and is an extension of the population nearby in the Wallowa Mountains of Oregon (Birdweb 2005). The Green-Tailed Towhee is a local and rare breeder at moderate elevations in the Blue Mountains where it is found mainly in ponderosa pine-sagebrush associations in dry, brushy foothills and canyons (Marshall et al. 2003). In southeastern Washington, the green-tailed Towhee breeds in dry shrubby hillsides and post-disturbance shrubby second growth areas that have a high diversity of shrub species providing dense, low cover.

FIGURE GT- 1: BREEDING RANGE OF THE GREEN-TAILED TOWHEE IN WASHINGTON BASED ON HABITATS IDENTIFIED USING 1991 SATELLITE IMAGERY, BREEDING BIRD ATLAS (BBA), OTHER DATASETS AND EXPERTS THROUGHOUT THE STATE, AS PART OF THE WASHINGTON GAP ANALYSIS PROJECT. WWW.BIRDWEB.ORG/BIRDWEB/BIRD

Threats

Conflicting impacts of humans on towhee breeding habitat, including negative effects of fire suppression but potentially positive effects of logging, may influence the stability of towhee populations overall (Dobbs et al 1998). Logging in high-elevation forests may increase available habitat for breeding towhees by reducing overstory and increasing shrub layer (Franzreb and Ohmart 1978; see also below). Although this kind of habitat alteration may be favorable to towhees, fire suppression associated with timber production may result in reduced breeding habitat in high-elevation coniferous forests (Beedy 1982, Raphael et al. 1987, Hejl 1994) through both degradation of suitable disturbed forest habitat (through forest succession) and limitation of postfire succession (by fire suppression regimes) that creates suitable habitat for breeding (Braun et al. 1976).

Determination of Effects

The breeding population of the green-tailed towhee is considered imperiled (S2B) in Washington, but globally it is considered secure (G5) and nationally it is considered secure (N5) (NatureServe 2012). In Oregon, populations are considered apparently secure (S4B). A portion of the Umatilla National Forest extends into southeast Washington where this species is considered sensitive by the Forest Service. As such, only the Umatilla National Forest is addressed for this species.

The green-tailed towhee is within the Family Woodland/Grass/Shrub, and Group Woodland/Shrub represented by the focal species loggerhead shrike (USDA 2010) which was not modeled for alternative B (Wales et al. 2011). Based on the breeding habitat descriptions given for the green-tailed towhee in Washington, this species is more likely represented by the fox sparrow which represents the early successional stage in the open forest community. The viability model for the fox sparrow projected an improvement of the early successional stage within the Blue Mountains which led to an improvement in the level of concern (table FS-1).

Table FS-1: Level of viability concern on the Umatilla National Forest currently and projected for each alternative.

Focal Species	Current	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
Fox sparrow	M	M	M	M	M/L	M/L	M

All action alternatives prioritize restoration treatments in the dry PVGs. Likely management actions that open up the canopy and promote shrub development whether through burning or cutting should benefit this species. Alternative D proposes the most.

Umatilla National Forest

Breeding Bird Survey records indicate that there have been no major changes in the Washington population since 1966 (Birdweb 2005). This population is at the northern edge of the range and because of this is not likely to ever be widespread or common in Washington.

Given the above, the fact that habitat for this species increases over time under all alternatives, and that the quality of habitat is not expected to be reduced from implementing the plan under any alternative it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Green-tailed towhees are migratory, so only breeding populations are considered sensitive.

2. This species is only sensitive in Washington as green-tailed towhee populations are considered apparently secure in Oregon.
3. Early successional habitat is projected to increase under all alternatives within the plan area.
4. The green-tailed towhee is highly mobile and could easily disperse throughout the planning area and although it is considered imperiled in Washington it has a large range throughout western North America.
5. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
6. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

Because the breeding population of green-tailed towhee is restricted to the Blue Mountains in Washington where it is listed as sensitive but it is considered secure outside of this area, cumulative effects would only be addressed within that geographic area. As previously noted Umatilla NF manages 52% of this eco-region in Washington (figure E-1) and essentially all of the current breeding areas for this species and as such no cumulative effects are expected from non-federal entities to the breeding population found in Washington.

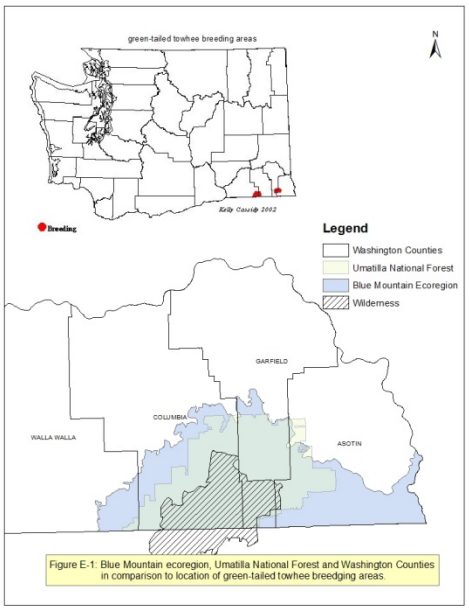


Figure E-1: Blue Mountain ecoregion, Umatilla National Forest and Washington Counties in comparison to location of green-tailed towhee breedging areas.

Woodland-Grass-Shrub Family/Shrub Group

Pygmy Rabbit

Life History and Habitat Description

The historical distribution of the pygmy rabbit included much of the semiarid shrub steppe biome of the Great Basin and adjacent intermountain regions of the western United States (Green and Flinders 1980a), and included portions of Montana, Idaho, Wyoming, Utah, Nevada, California, Oregon, and Washington. Pygmy rabbits occur in a variety of semiarid shrub steppe habitat types that are found throughout their historical distribution. A recently developed database of range wide occurrences combined with an assessment of potentially suitable shrub steppe vegetation communities throughout the western United States has allowed the USFWS (2012) to refine the estimated historical distribution of the pygmy rabbit (Figure pygmy-1).

Pygmy rabbits are not currently distributed continuously across their range, nor were they in the past. Rather, they are found in areas within their broader distribution where suitable habitats occur. The local distribution of suitable habitat patches, and thus pygmy rabbits, likely shifts across the landscape in response to various sources of disturbance (*e.g.*, fire, flooding, grazing, crop production) combined with long- and short-term weather patterns. In the past, more dense vegetation along permanent and intermittent stream channels, alluvial fans, and sagebrush plains provided travel corridors and dispersal habitat for pygmy rabbits between appropriate use areas (Green and Flinders 1980a; Weiss and Verts 1984; WDFW 1995). Since European settlement of the western United States, more dense vegetation associated with human activities (*e.g.*, fence rows, roadway shoulders, abandoned fields) likely also

provide avenues for dispersal between local populations of pygmy rabbits (Green and Flinders 1980a; Pritchett et al. 1987)

Pygmy rabbits occur as small disjunct populations in Oregon (Marshall et al. 1996). Habitat for this species consists of islands of tall dense stands of big sagebrush in deep (greater than 20 inches) loose soils (Weiss and Verts 1984). It is highly dependent on sagebrush for food and shelter throughout the year. Big sagebrush (*Artemisa tridentata*) is the primary food source, particularly in winter, but grasses (particularly native bunch-grasses, such as *Agropyron* spp. and *Poa* spp.) and forbs also are eaten in spring and summer (Green and Flinders 1980, Lyman 1991).

Unlike most other rabbits, it digs burrows, which are around 3 inches in diameter; a burrow may have multiple entrances. Pygmy rabbits occasionally use of burrows abandoned by other species and may occur in areas of shallower or more compact soils if these sites support sufficient shrub cover (USFWS 2010). Microhabitat for nesting is poorly known; prior to 2005 evidence of nests had not been found in burrows (USFWS 2010). Rachlow et al. (2005) provide information on seven natal burrows found in Lemhi Valley, Idaho. Two other studies (Burak 2006, Larrucea 2007) also documented natal burrows. Because pygmy rabbits dig their own burrows, soil texture and content is very important (Hagar and Lienkaemper 2007).

Pygmy rabbits tend to have relatively small home ranges during winter and larger home ranges during spring and summer. Home range size varies between genders and can vary from one to over 70 acres (Katzner and Parker 1997, WDFW 1995). Crawford (2008, p. 47) found that pygmy rabbit annual home ranges in southeastern Oregon and northwestern Nevada differed between the sexes and ranged from 1.2 to 25.8 acre for males and 0.27 to 18.7 acre for females. During the breeding season, home ranges for males ranged from 0.27 to 18.5 acre and from 0.15 to 17.5 acre for females.

Although some authors have suggested pygmy rabbits have a low dispersal potential due to their small home ranges and apparent reluctance to cross open areas (Weiss and Verts 1984, Marshall et al. 1996)), individuals have been observed traveling relatively long distances (Green and Flinders 1979, Katzner and Parker 1998). Estes-Zumpf (2008) observed median dispersal movements of 1.2 and 4.8 km and maximal dispersal movements of 6.4 and 12.1 km by juvenile male and female pygmy rabbits, respectively, in Idaho and southwestern Montana. Crawford (2008) recorded dispersal events in excess of ½ mile with the greatest being in excess of 5 miles in southeastern Oregon. During such movements, individuals likely use clumps of sagebrush as resting and foraging sites when crossing otherwise unsuitable areas (Katzner and Parker 1998). Documentation of this species' ability to cross unsuitable habitat may suggest that populations are not as isolated as previously described (Katzner and Parker 1998, Crawford 2008).

Threats

The single largest loss in cover types within the Columbia Basin has been the decline in big sagebrush (Hann and others 1997). According to the U.S. Fish and Wildlife Service (USFWS 2010) conversion of pygmy rabbit habitat to agriculture, although it has occurred has not led to a significant loss of habitat in most of its range including Oregon. On the other hand, Leu and Hanser (2011) indicated that a large portion of the more productive big sagebrush habitat has been converted to agricultural land. The removal of sagebrush to improve rangelands for domestic livestock grazing has had a large impact on sagebrush habitats (Flinders et al. 2005) but the current altered disturbance regimes and threat of invasive species (e.g., cheatgrass) coupled with climate change are probably the greatest threat to the sagebrush ecosystem (Miller et al. 2011). Sagebrush cover is critical to pygmy rabbits and with this dependence on big sagebrush, pygmy rabbits are likely vulnerable to sagebrush eradication and fragmentation (Holechek 1981, Katzner and Parker 1998), which renders habitat inadequate to support populations and may limit dispersal.

All of the sites surveyed by Hagar and Lienkaemper (2007) in Oregon had evidence of cattle grazing, and in many areas it was evident that heavy use by cattle had resulted in a decrease of shrub cover. In addition to reducing shrub cover through trampling, grazing by cattle also has been reported to reduce the nutritional quality of forage for pygmy rabbits (Siegel Thines et al., 2004).

Invasion of exotic vegetation, altered fire regimes, road development, and use, mining, energy development, climate change, encroachment of pinyon-juniper woodlands, intensive grazing by livestock, and conversion to agriculture, to urban use, and to non-native livestock forage all have contributed to the continuing demise of the sagebrush ecosystem (Noss et al. 1995, Tausch et al. 1995, Knick 1999, Miller and Eddleman 2000, Bachelet et al. 2001, Bunting et al. 2002).

Determination of Effects

The pygmy rabbit is within the Family Woodland/Grass/Shrub and the Shrub Group. It is not listed for either the Umatilla or Wallowa-Whitman National Forests. It is suspected for the Malheur portion of the planning unit and therefore the remaining discussion is restricted to the Malheur National Forest. The focal species that best represents the pygmy rabbit is the sage thrasher. Overall only about 50,000 acres of big sagebrush habitat occur within the Malheur National Forest. The viability model for the sage thrasher projected little change in the abundance of shrub dominated communities on NFS lands due to management activities. Currently there is a moderate concern for the viability of the sage thrasher (table ST-1), which does not change under any alternative over time. Likely the viability for the pygmy rabbit would be similar.

Table ST-1: Level of viability concern by national forest for the sage thrasher currently and under each alternative.

	Level of Concern						
		Alternative					
National Forest	Current	A	B	C	D	E	F
Umatilla	M	M	M	M	M	M	M
Malheur	M	M	M	M	M	M	M
Wallowa-Whitman	M	M	M	M	M	M	M

The plan identifies sagebrush steppe as a special habitat in all alternatives, with a desire of no net loss and at least 70 percent with an understory of native species, resulting in conditions that are sustainable and resilient to disturbance, meaning that they are capable of recovering to their potential community without intervention after a disturbance. The other 30 percent of the landscape would include areas of juniper encroachment, non-sagebrush shrub lands, annual grasslands, and non-native perennial grasslands that potentially could be re-habilitated and enhanced as sagebrush habitat. This would be true no matter which action alternative is being evaluated.

Management activities proposed under any alternative that may occur in potential pygmy rabbit habitat is primarily livestock grazing. As indicated above, no management is planned to eradicate sagebrush habitat. Ironically, Marshal et al. (1996) pointed out that some dense sagebrush stands occur where past heavy grazing or cultivation eliminated natural vegetation. It is assumed that livestock grazing would be managed in a manner to promote movement of rangeland ecosystems toward desired conditions of the plan (HRV). Based on both utilization and stocking levels, Alternative C, followed by E and F would be the least potential effects from livestock grazing to sagebrush habitats based on utilization within the uplands (RNG-5 and RNG-6 G-47), however all alternatives are to manage grazing in a manner to achieve HRV. According to the Fish and Wildlife Service (USFWS 2010) there are several examples where pygmy rabbits have been document to continue to occupy areas grazed by livestock, which may indicate an apparent compatibility between livestock grazing and area use by pygmy rabbits under certain

grazing conditions. They concluded that livestock grazing was not a significant threat to the pygmy rabbit now or in the foreseeable future.

All alternatives desire plant communities as well as disturbance regimes (i.e., fire) to be within HRV, which should preclude the use of fire as a management tool in the sagebrush community where the risk of exotic grass invasion is high. This species may benefit from standards and guidelines addressing sage grouse habitat (Rowland et al. 2006) which may overlap with potential pygmy rabbit habitat: Alternatives E and F provide added management emphasis with standards and guidelines (FIRE-4 *New*; FIRE-5 *New*; WLD-HAB-24 *New*) to call attention to this risk. Additionally there are standards that address the spread of noxious weeds and plan components that guide restoration.

The pygmy rabbit is considered apparently secure (NatureServe 2012) both globally (G4) and nationally (N4). The Oregon population is considered imperiled (S2?) and the Washington population is considered critically imperiled (S1). The Washington population was classified as a distinct population segment (DPS) in 2003 (USFWS 2003) and is considered isolated from other populations (Figure pygmy-1). The Columbia Basin DPS range of this species in Washington does not include national forest lands in the Blue Mountains (USFWS 2012).

Malheur National Forest

The Forest database includes 3 observations on the BLM Prineville District, one of those very near to the Blue Mountain RD. In addition, there is 1 recorded sighting of an individual in the Elkhorn TS on the Blue Mountain Ranger District (1990), although the reliability of this observation is unknown. As discussed under sage grouse and indicated in figure sage-1, there really are only minor amounts of potential habitat on the Malheur National Forest which lessens the probability that it occurs on the forest.

Given the above, the results of the focal species assessment model for the sage thrasher, there is little proposed management in the potential source habitat that is expected to negatively affect this species under any alternative, and that the quality of habitat is not expected to be reduced from implementing the plan under any alternative it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. The focal species assessment model for this group indicated no change in the concern for viability within the plan area.
2. The pygmy rabbit has a moderately large range throughout western North America.
3. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
4. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Umatilla National Forest

The pygmy rabbit is not known or suspected to occur on the Umatilla National Forest.

Wallowa-Whitman National Forest

The pygmy rabbit is not known or suspected to occur on the Wallowa-Whitman National Forest.

Cumulative Effects on species

There has been a recent and widespread interest in the protection and restoration of sagebrush habitats with an emphasis on greater sage-grouse conservation (Hagen 2011). It is uncertain whether efforts implemented to improve greater sage-grouse habitat will benefit pygmy rabbits. Some habitat manipulation to benefit greater sage-grouse could benefit pygmy rabbit (e.g. p. 127). Connelly et al. (2000) recommend managing sagebrush canopy cover for greater sage-grouse habitat at 10 to 25 percent for brood-rearing, 15 to 25 percent for breeding habitat, and 10 to 30 percent for winter habitat. Pygmy rabbits, in general, prefer taller, denser sagebrush cover relative to the surrounding landscape (Green and Flinders 1980b, p. 138; Weiss and Verts 1984, p. 567), which can be greater than the 10 to 30 percent range suggested for greater sage-grouse habitat needs during their various life history stages. Burak (2006, pp. 63-64) found total shrub cover values ranged from 41 to 67 percent and sagebrush cover values ranged from 12 to 60 percent in areas occupied by pygmy rabbits. Reducing dense sagebrush cover to benefit greater sage-grouse may be in conflict with habitat needs of pygmy rabbits.

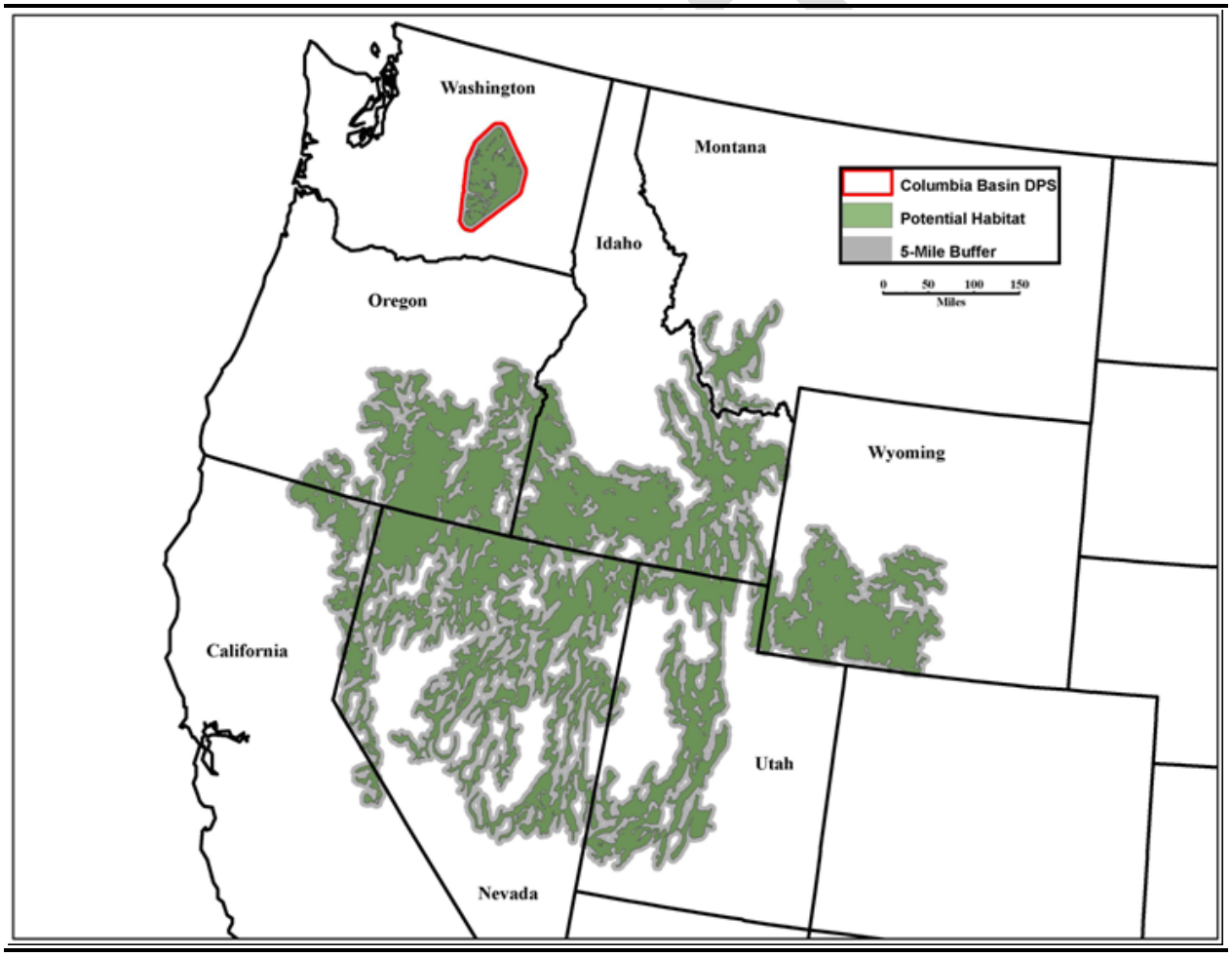


Figure pygmy-1. Approximate historical distribution of the pygmy rabbit based on available occurrence data and the distribution of potentially appropriate shrub steppe community types (USFWS 2012).

Woodland-Grass-Shrub Family/Grass-Shrub Group

Sharp-tailed Grouse

Life History and Habitat Description

The Columbian sharp-tailed grouse is one of seven recognized subspecies of sharp-tailed grouse that have been described in North America. Formerly widespread from British Columbia and northern California to Montana and Colorado, it now occupies less than 10% of former range and is threatened by habitat loss/degradation due to agricultural practices and livestock overgrazing (NatureServe 2012). According to Oregon Department of Fish and Wildlife (ODFW 2009) Columbian sharp-tailed grouse were historically found in most counties of eastern Oregon where they preferred the bunchgrass prairies interspersed with stream bottoms containing deciduous shrubs and trees. This habitat was particularly common in north-central Oregon and the Columbia Basin. These same areas were also attractive to early homesteaders which had converted most of the bunchgrass prairie to crop production by 1915. In 1929, Oregon closed its hunting season for sharp-tailed grouse and it has never re-opened. The species was gone from Wallowa County by the late 1940s, and the last Columbian sharp-tails in Oregon probably occurred in Baker County, Oregon. By the late 1960's sharp-tailed grouse were believed to have been extirpated from Oregon.

Since its extirpation, personnel of state and federal agencies and private citizens have expressed interest in the reintroduction of Columbian sharp-tailed grouse into Oregon. This species, one of very few extirpated from Oregon, was absent from the state for over 20 years before being re-introduced in early 1991. A total of 12 releases have resulted in translocation of 368 grouse from southeastern Idaho and northeastern Utah to Wallowa County, Oregon, since 1991. Grouse dispersed from the initial release site (Clear Lake Ridge) to the Leap Area north of Enterprise, OR. Consequently, all subsequent releases have been made at the Leap Area, a site used by grouse from 1991 through present (ODFW 2009, Snyder 2001)

Columbian sharp–tailed grouse habitat is characterized by bunchgrass and shrub/bunchgrass rangelands in good ecological condition with at least 20% of the landscape in tall, deciduous shrub thickets provided by riparian zones, mountain shrub patches, and aspen stands (Giesen and Connelly 1993, McArdle 1977, Saab and Marks 1992). Sharp-tailed grouse primarily choose habitat based on height and density of vegetation, and secondarily on species composition (Hoffman and Thomas 2007, Hoffman 2001). Good sharp-tailed grouse habitat contains well developed perennial bunchgrasses, forbs, and many species of shrubs (Marks and Marks 1987, Stinson and Schroeder 2012). In summer they spend most of their time in more open grasslands, while in the winter they make use of trees and shrubs for cover such as deciduous trees and shrubs located in riparian or mountainous areas (Marks and Marks 1988, Giesen and Connelly 1993).

Spring-to-fall home range sizes of Columbian sharp-tailed grouse are relatively small and the areas used are usually within a short distance of a lek (Hoffman and Thomas 2007, Giesen and Connelly 1993). Columbian sharp-tailed grouse remain in shrub-steppe habitats until the onset of snow, when they form small flocks and move to either riparian or mountain shrub communities where vegetation remains above the snow line. Seasonal movements to wintering areas from breeding grounds are typically less than three miles (Marks and Marks 1988).

Sharp-tailed grouse nest on the ground, preferably among tall, rank grasses, but may also nest in brushy or woody areas (DeGraaf et al 1991). Residual herbaceous vegetation is important nesting cover because little current growth is available in early spring when most nests are constructed (Prose 1987). Female sharp-tailed grouse usually do not travel far from leks (dancing or breeding grounds) to nest if suitable cover is available (Hoffman and Thomas 2007).

Threats

Excessive hunting in the mid- to late-19th century is thought to be a major contributing factor to the early extirpation of local populations and the initial reduction of the Columbian sharp-tailed grouse range. Since the turn of the 20th century, the conversion of native habitats to crop production and habitat degradation as a result of livestock grazing are thought to be the primary factors in population declines and range reduction (Buss and Dziedzic 1955; McDonald and Reese 1998). Modern fire suppression policies have allowed conifers to invade bunchgrass-prairie habitats in some areas to the detriment of sharp-tailed grouse populations. In these situations, prescribed burning may be effective in maintaining suitable habitats (Giesen and Connelly 1993).

In western Idaho, mountain shrub and riparian cover types were the most important winter habitats for Columbian sharp-tailed grouse. These cover types are sometimes heavily damaged by livestock. Any disturbance that may damage or eliminate these cover types may have severe negative impacts on Columbian sharp-tailed grouse (Marks and Marks 1988). In general, grazing should be regulated so that approximately 15 percent of an area remains unused during a season (Sisson 1976). Implementation of light or moderate grazing levels, or varied grazing systems, may maintain or improve forage conditions on range lands and do not necessarily adversely affect Columbian sharp-tailed grouse populations (USFWS 2006a).

Fire is a continual threat to sharp-tailed grouse populations (Tirhi 1997). Fire has become a major tool for altering large blocks of sagebrush rangelands. In Lincoln County (WA), three large prescribed fires and one chemical control of sagebrush in the 1980s, in areas containing active leks, were believed to be directly responsible for the decline of both sharp-tailed grouse and sage grouse populations (Stinson and Schroeder 2012). McArdle (1977) found less use by sharp-tailed grouse in burned areas compared to other vegetation manipulations. Modern fire control policies have allowed conifers to invade bunchgrass-prairie habitats in some areas, so in these situations prescribed burning may be effective in maintaining suitable habitats. Factors such as drought and inclement weather may also significantly affect the population in Oregon due to the small population size.

Determination of Effects

The sharp-tailed grouse is within the Family Woodland/Grass/Shrub and the Grass/Shrub Group. It is not listed for either the Umatilla or Malheur National Forests. A re-introduced population is known for the Wallowa-Whitman portion of the planning unit and therefore the remaining discussion is restricted to the Wallowa-Whitman National Forest. The focal species identified for this group was bighorn sheep which was not modeled using a focal species assessment model.

Lek counts and summer flush counts since the initial release indicate a small, persisting population of grouse is present in Wallowa County. These counts indicate sharp-tailed grouse numbers have fluctuated since their reintroduction, most recently peaking in 2002 and 2003 and declining after the 2003-04 winter. It was expected that translocation efforts made in 2006 - 2009 and continued habitat improvements would cause this species to once again become a permanent part of Oregon's diverse suite of grouse species (ODFW 2009).

Most of the habitat areas in Oregon that are currently or may potentially be used by Columbian sharp-tailed grouse occur on privately-owned lands. Some large portions of these privately-owned lands have been withdrawn from crop production and planted to native and non-native cover under the federal Natural Resources Conservation Service (NRCS) Conservation Reserve Program (CRP), established in 1985. A portion of Wallowa County that currently supports a reintroduced population of Columbian sharp-tailed grouse has been designated a Conservation Priority Area by the NRCS under the CRP program in order to benefit the species (Coggins and Matthews 2000).

Overall approximately 22,000 acres of bluebunch wheatgrass habitat occurs within the planning area of the Wallowa-Whitman. An additional 20,000 acres of sagebrush habitat also occurs. Sagebrush steppe is identified as a special habitat in all alternatives, with a desire of no net loss and at least 70 percent with an understory of native species, resulting in conditions that are sustainable and resilient to disturbance, meaning that they are capable of recovering to their potential community without intervention after a disturbance.

Management activities proposed under any alternative that may occur in potential sharp-tailed grouse habitat is primarily livestock grazing. As indicated above, no management is planned to eradicate sagebrush habitat. It is assumed that livestock grazing would be managed in a manner to promote movement of rangeland ecosystems toward desired conditions of the plan (HRV). Based on both utilization and stocking levels, Alternative C, followed by E and F would be the least potential effects from livestock grazing to sagebrush habitats based on utilization within the uplands (RNG-5 and RNG-6 G-47), however all alternatives are to manage grazing in a manner to achieve HRV. All alternatives desire plant communities as well as disturbance regimes (i.e., fire) to be within HRV, which should preclude the use of fire as a management tool in the sagebrush community where the risk of exotic grass invasion is high. This species may benefit from standards and guidelines addressing sage grouse habitat (Rowland et al. 2006) which may overlap with potential sharp-tailed grouse habitat: Alternatives E and F provide added management emphasis with standards and guidelines (FIRE-4 *New*; FIRE-5 *New*; WLD-HAB-24 *New*) to call attention to this risk. Additionally there are standards that address the spread of noxious weeds and plan components that guide restoration.

The Columbia sharp-tailed grouse is considered vulnerable (NatureServe 2012) nationally (N3). The Oregon population is considered critically imperiled (S1).

Malheur National Forest

Species is not known or suspected to occur on the Malheur National Forest.

Umatilla National Forest

Species is not known or suspected to occur on the Umatilla National Forest

Wallowa-Whitman National Forest

According to the proposed listing (USFWS 2006a) for this species the translocation effort in Oregon has likely failed and the population appears to be extirpated from the State. Lek counts conducted as late as 2009 however indicate the bird has persisted within the Leap area on private land (ODFW 2009). The species is not present on the Wallowa-Whitman National Forest.

Because no occupied habitat occurs on national forest lands and plan components are in place that will not cause deterioration of habitat by implementing the plan under any alternative there will be **No Impact** to the sharp-tailed grouse under any alternative.

Cumulative Effects on species

Although sharp-tails can adapt to agriculture, large scale conversions or alteration of native habitats can be detrimental (McDonald and Reese 1998, Schroeder et al. 2000). Additionally the conversion of agricultural lands to residential lands threatens future recovery of habitat. Some authors speculate that a population decline can be expected if the Conservation Reserve Program is discontinued or participation in the program declines (Hoffman 2001, Snyder 2001). A possibility exists that this species could be re-introduced to Nature Conservancy lands on the Zumwalt prairie but there are no plans to attempt to establish populations outside of Wallowa County (Pat Mathews, ODFW).

Preble's shrew (Washington Only)

Life History and Habitat Description

The range for the Preble's shrew extends from extreme southern British Columbia to eastern Montana south to Oregon; records are sparse, but this may be the result of difficulty in capturing the species; recent pitfall trapping has substantially increased the number of known sites (NatureServe 2012). Recorded habitats include arid and semiarid shrub-grass associations, openings in montane coniferous forests dominated by sagebrush (Washington), willow-fringed creeks, marshes (Oregon), bunchgrass associations, sagebrush-aspen associations (California), sagebrush-grass associations (Nevada), and alkaline shrubland (Utah) (Cornely et al. 1992; Hoffmann et al. 1969; Williams 1984).

Until recently, the Preble's shrew was known only from the Blue Mountains in Washington. All specimens were found in a small area including Subalpine Fir/Lodgepole Pine, and Grand Fir/Englelmann Spruce forests between 5000 and 6000 feet (NatureMapping Foundation 2012). These are atypical habitats when compared to where these shrews are found in other states. It is believed that this species is at the very edge of its range in Washington State. Recently it was collected in Douglas County (indicated by star in figure PS-1) of south-central Washington (Gitzen et al. 2009).

As Gitzen et al. (2009) note the natural history of the Preble's shrew and its distribution across western North America is poorly understood. Although *S. preblei* has been captured at numerous locations in eastern Oregon (Verts and Carraway 1998), only one location exists for the Blue Mountains with the majority being in southeastern Oregon in association with grasses and sagebrush. Verts and Carroway (1998) suggested that the "rarity" of this shrew was largely a factor of sampling effort. Although NatureServe (2012) still shows this shrew as distributed only in extreme SE Washington, it was recently collected in Douglas County (indicated by star in figure PS-1) of south-central Washington (Gitzen et al. 2009). Also Shohfi et al. (2006) extended the range of this shrew some 140 km southward in California.

As Verts and Carroway (1998) noted the wide variety of habitats occupied by this shrew suggests that their requirements may be more specific than those described by the dominant vegetation or soil moisture regime. Although the original high-elevation forested sites for Washington were considered atypical, the two sites recently documented in California were also at high elevations- subalpine woodlands (Shohfi et al. 2006). The recent find in Washington was associated with formerly cultivated private land enrolled in the USDA Conservation Reserve Program (CRP), about 170 km south of the nearest British Columbia locality and about 235 km northeast of previous Washington records (Gitzen et al. 2009). Most Preble's shrews captured in Montana have been associated with extensive arid sagebrush-grassland habitat in non-forested terrain or smaller openings of similar habitat within coniferous forest, but are not restricted to sandy soils (Hendricks and Roedel 2002).

Because this shrew has a relatively low bite force suggests that it feeds on soft-bodied prey (Verts and Carroway, 1998) such as earthworms, slugs, and caterpillars. On the basis of skull morphology Cornely et al. (1992) suggested that *preblei* has its closest affinity to *S. cinereus* whose food habits are better understood. Such affinity supports *preblei*'s projected prey as being soft-bodied as *S. cinereus*'s diet is mostly larvae of Lepidoptera (Bellocq et al. 1994, McCay and Storm 1997).

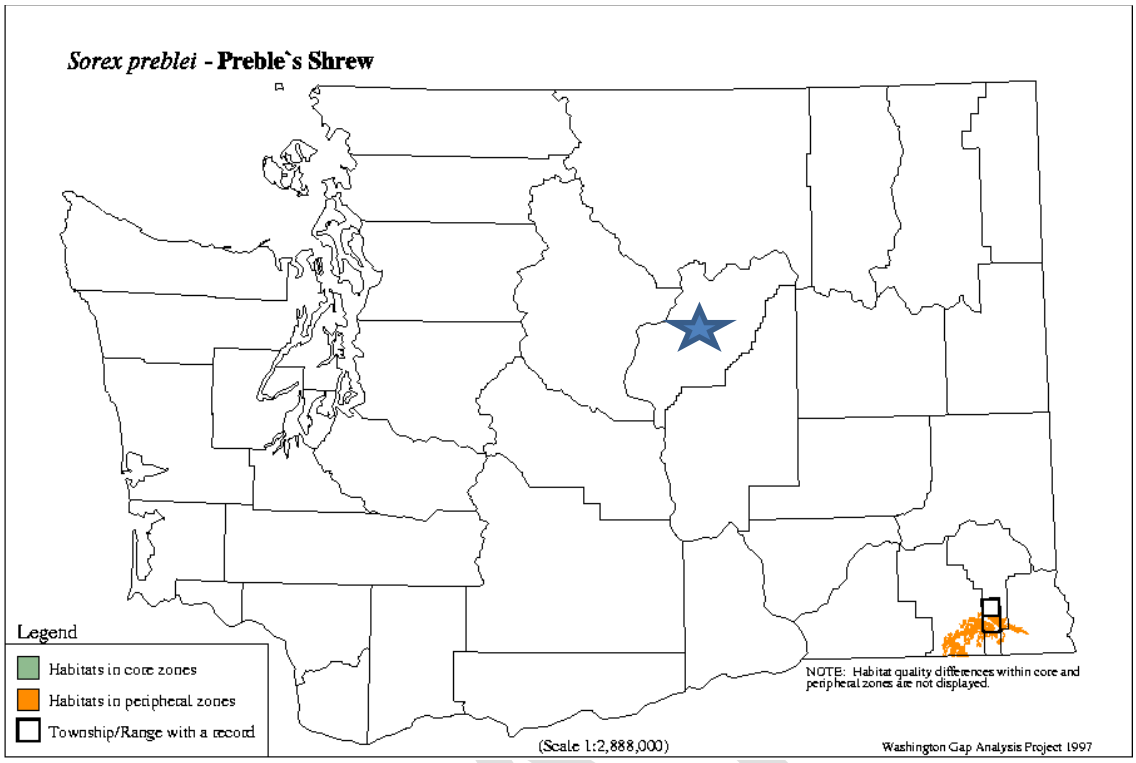


FIGURE PS- 1: SUSPECTED RANGE OF PREBLE'S SHREW IN WASHINGTON.

Threats

According to NatureServe (2012) there are no known threats. It has been suggested that management activities could result in less food availability, however this is highly speculative. Whitaker et al. (1983) found that although livestock grazing resulted in less availability of earthworms due to compaction that *S. vagrans* changed feeding habits in response, consuming more caterpillars. Shrews can be viewed as opportunistic feeders, and, given the energetic constraints under which they live they cannot afford to ignore potential food items. For this reason most shrew species demonstrate a high diversity of prey items in their diet (Kirkland 1991; Churchfield 1991). Moore et al. (2002) did not find a significant difference in the abundance of soil fauna between harvested and un-harvested hardwood forests in Canada and Zwolak (2009) could not identify a significant response either short or long term to timber harvest for two shrew species. Bellocq et al. (1992) did not find a change in total abundance of *S. cinerus* between control and forested area sprayed with an insecticide, although a shift from lepidopteron larvae to an alternate prey occurred in the treated area.

Determination of Effects

Because there are no known threats to this species and it inhabits a wide spectrum of habitats, it is difficult to determine what impacts if any would result from implementing any of the alternatives. Although it was included in the woodland/grass/shrub family and the grass/shrub group (USDA 2010), it is clear that, at least for the Blue Mountains of Washington, the focal species for this group would not be representative for this species. Less than 35% of the national forest lands in the Washington Blue Mountains are within MA 4 (active management area), meaning that 65% will not see active management

(see figure E-1) other than livestock grazing which only occurs on approximately 28% of the area. Because the overreaching intent of all alternatives is to move towards the historical range of variation, it seems extremely unlikely that there would be long term negative effects to this shrew with the implementation of any of the alternatives proposed.

Umatilla National Forest

Although the Preble's shrew is considered imperiled in Washington, nationwide it is considered apparently secure (N4). In Oregon it is considered vulnerable (S3?) probably due to a restricted range which Verts and Carraway (1998) suggest is primarily an artifact of little sampling effort. In Washington, the species is considered critically imperiled (S1), probably due to its previous highly restricted range. The analysis above suggests a degree of plasticity such that under any alternative it is likely that proposed management activities **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. No known threats have been identified for this species.
2. More than 65 percent of the Washington portion of the Blue Mountains is in management areas that are not actively managed (i.e., wilderness or roadless areas).
3. The Preble's shrew appears to utilize a broad spectrum of habitats and its range has been extended in Washington.
4. The Preble's shrew is considered apparently secure nation wide
5. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
6. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

In general, shrews appear to be opportunistic regarding habitat and prey. Obviously based on Gitzen (2009), *S. preblei* is found on private lands and is capable of adapting to past habitat alteration activities. Intensive livestock grazing and conversion, degradation and/or fragmentation of habitat are probably the greatest cumulative risks to the shrew. In general it is estimated that functional habitat for all wildlife continues to be altered at a rate of 30,000 to 80,000 acres per year in Washington (WDFW 2005).

Mountain Goat (Washington only)

Life History and Habitat Description

Mountain goat habitat varies throughout North America ranging from dense coastal forests at sea level in Alaska and British Columbia (Hebert and Turnbull 1977) to alpine basins in Colorado (Hibbs 1967) and Oregon (Matthews and Coggins 1994). According to a 2000 review, mountain goats use all seral stages within forests except for the stem exclusion stage of montane and lower montane forests (Wisdom et al. 2000). Mountain goats often forage in open, grassy alpine and subalpine habitats where they are most vulnerable to predation, and therefore they tend to select foraging sites within 1,300 feet (400 m) of steep, broken, rocky terrain—often called escape terrain—that includes rock ledges, outcrops, and cliffs (Innes 2011). In winter, mountain goat habitat use is largely determined by snow depth and hardness, but

typically foraging mountain goats select treeline rock outcrops, windblown alpine ridges, and shrubby and forested sites that lack persistent, deep or crusted snow (*ibid*).

The most important factors influencing habitat selection by goats appears to be security from predators and acquisition of food (Gross et al. 2002). The steep and broken topography characteristic of escape terrain often has substantial surface rock and does not support productive plant communities, so the survival advantages of selecting escape terrain may be offset by the quality and quantity of available forage at those sites (Hamel and Cote 2007)

Native mountain goats in Washington currently occupy both the Cascade and Selkirk Mountain Range, which is similar to their historic distribution in the state as early as the 1800's when the first mountain goats were documented in Washington (Beus 2010; Wells et al. 2011). They are also found living in the Olympics where they were introduced in the 1920s. Mountain goats in Washington occupy two very distinct ecosystems, the very wet areas of western Washington as well as the dry open areas in the eastern region of the state. Though goat populations adapt to diverse regional variation, they generally prefer a band of habitat near tree line, which varies in elevation throughout Washington.

The majority of authors do not include the Blue Mountains of Washington in the historical distribution of mountain goats (Côté and Festa-Bianchet 2003; Johnson 1977; Johnson 1977a; Lyman 1988; Rideout and Hoffmann 1975). Most of the published works attempting to establish the historic range of mountain goats in the Pacific Northwest have relied on anecdotal information due to the lack of confirmed records. For example, Dice (1919) stated that "Goats are reported by Floyd Kendall [Forest Ranger on the Imnaha] to have occurred at one time in the Blue Mountains of Washington but they are now absent from the region ". Regarding this record, Bailey (1939) suggests that although it cannot be ignored, it seems very doubtful. Dalquest (1948) [in Johnson 1977] felt that this report by Dice was based on erroneous identification and Johnson (1977) stated that goats do not currently inhabit the Blue Mountains of Washington. Both Bailey (1936) and Verts and Carroway (1998) were doubtful that mountain goats occurred naturally in Oregon. Using several anecdotal accounts, published reports of archaeological evidence of mountain goats on the Idaho side of Hells Canyon and an unpublished report of similar evidence at Camp Creek on the Oregon side of Hells Canyon, Mathews and Coggins (1994) concluded that mountain goats were "indigenous to the northeast corner of Oregon and most likely portions of the Oregon Cascades". Mathews and Heath (2008) reviewed historical publications and go to great lengths to establish Oregon in the historical distribution for this species and conclude:

> *The literature suggests to us that mountain goats existed in small isolated populations in the Oregon Cascades and northeast Oregon both pre-historically and historically, and that extirpation of the mountain goat from Oregon occurred during the early to mid-nineteenth century probably as a result of over harvest and stochastic events.*

In any event, goats were introduced into the Wallowa Mountains starting in 1950 using animals from Chopaka Mountain in Washington and then augmented several times with animals from Olympic National Park, Idaho and Alaska leading Verts and Carroway (1998) to conclude that the "*homogenization of genetic material from several regions cause us to regard the question of subspecies of mountain goats in Oregon as moot*." Mathews and Heath (2008) do not present any new information regarding northeast Oregon compared to what was presented by Mathews and Coggins (1994) to which Verts and Carroway (1998) conclude that "*Considering that claimed specimen-based evidence of mountain goats remains unpublished, we are strongly skeptical of the proclaimed historic occurrence of the species in the state*."

Mountain goat populations typically occur as meta-populations scattered across the landscape on "habitat islands" where topographic and vegetative characteristics are suitable for goats. The sizes and distribution of these islands of suitable habitats are just now being documented in Washington (WDFW 2008). Mountain goat dispersal and establishment of sub-populations has been well documented (Ballard 1977; Festa-Bianchet et al. 1994; Lemke 2004; Toweill et al. 2004; Williams 1999). The establishment of a goat herd in the Strawberry Mountains of eastern Oregon demonstrates this. However even by the Mathews and Heath (2008) account, this would represent colonization of habitats outside its native range. The recent connectivity analysis in Washington (figure MTGO-1) for the mountain goat did not identify locations in the Wenaha-Tucanon Wilderness as "habitat concentrations areas" and therefore did not identify least cost corridors. It appears highly unlikely that interchange between the Blue Mountains and the current known populations of mountain goats in Washington would occur.

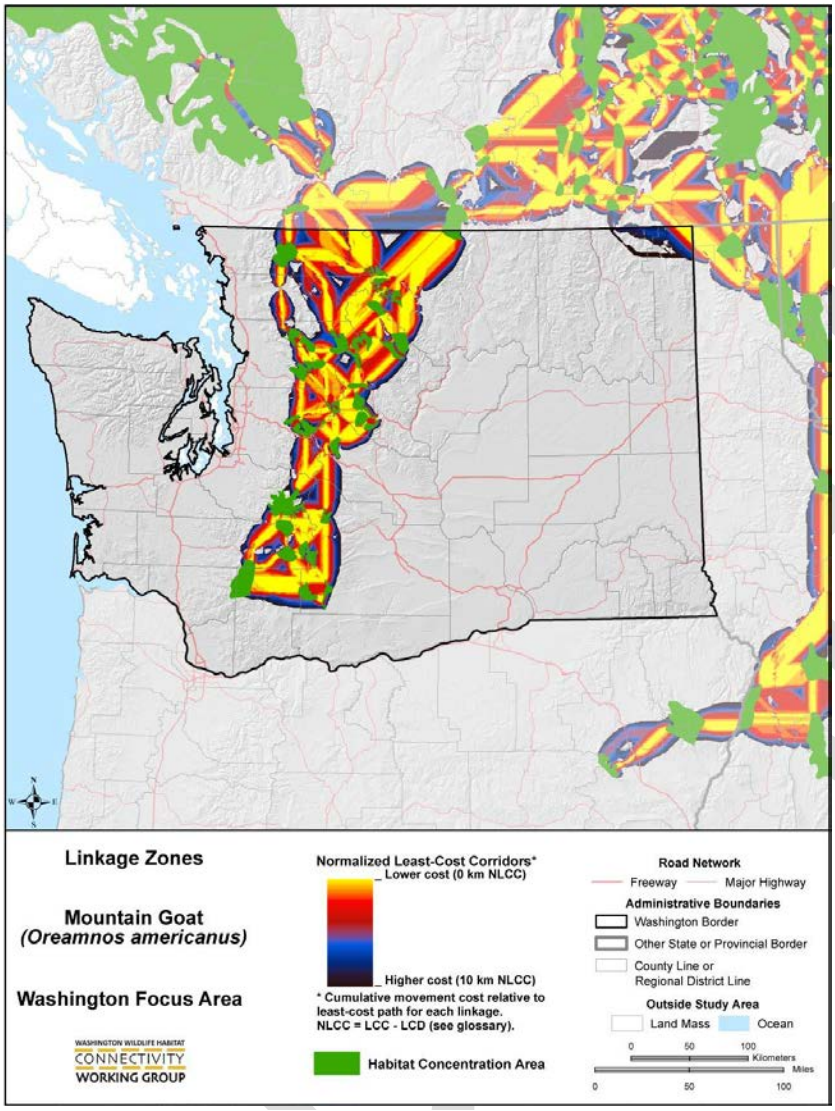


FIGURE MTGO-1: MOUNTAIN GOAT CONNECTIVITY ANALYSIS FOR WASHINGTON FROM WDFW 2008.

Threats

Threats to mountain goat populations include overharvesting, particularly of females; increased human disturbance in formerly isolated habitats; reduction in forage quantity and quality because of successional changes in habitats from fire exclusion; habitat fragmentation due to human land uses, habitat succession, and climate change (loss of alpine meadows); and tree removal in forested winter range (Festa-Bianchet and Cote 2007, Wisdom et al. 2000).

Human disturbance: Mountain goats are sensitive to human disturbance (Cote and Festa-Bianchet 2003, Festa-Bianchet and Cote 2007). They may habituate to human disturbance in some areas, but where disturbance is unpredictable; mountain goats tend to be alarmed by disturbance (Festa-Bianchet and Cote 2007, Varley 1998). Potentially adverse effects of disturbance on mountain goats included altered movements, range abandonment, increased vulnerability to predation, increased human access for hunting, and increased stress.

Logging can have both positive and negative effects on mountain goats. Overstory removal can increase forage productivity in areas where fire exclusion has reduced the extent of open habitats. However, logging may reduce winter cover and loss of cover could increase snow depth locally, thus making forage unavailable in logged sites during winter (Fox 1983, Wisdom et al. 2000). Logging also increases human access to mountain goat habitat through road construction, and this has led to increased hunting mortality in some herds (Chadwick 1973).

Mountain goat populations respond directly to fire-caused changes in cover and food. Fire's occurrence and its impacts on mountain goat populations apparently vary between alpine and forest habitats (Innes 2011). In general, the literature regarding fire effects in alpine and subalpine mountain goat ranges suggests that fire increases mountain goat forage availability and diversity, particularly herbs and shrubs important in the diet, and reduces tree encroachment, potentially for long periods (Innes 2011, Peek 2000, Toweill 2004a). In low and mid-elevation forests, fire may reduce important mountain goat forage and cover, particularly on winter rangelands (Hebert and Turnbull 1977). Fire exclusion can also result in increased density of trees in formerly open stands, reducing mountain goat forage quantity and quality. This has caused mountain goat rangeland deterioration and loss of quality habitat throughout the species' range (Blood 2000, Wisdom et al. 2000).

Determination of Effects

Many factors have led to declines in mountain goat populations including disease and parasitism, disturbance caused by recreational activities, winter habitat degradation through timber harvest, predation, loss of habitat due to conifer intrusion into alpine meadows as a result of fire suppression, and mineral, coal, gas and oil development (Coˆte´ and Festa-Bianchet 2003, Peek 2000, Varley 1998). Although fire suppression policies and natural forest succession continue to degrade important mountain goat foraging habitat in Washington, the degradation and loss of alpine meadows, coupled with increasing recreational human use and disturbance of alpine habitat are likely the two greatest negative impacts to mountain goats (WDFW 2011).

Direct habitat alteration in mountain goat range has not yet become a major concern for wildlife managers (ODFW 2003) and in fact, goats themselves have been the cause of degradation of sensitive alpine habitats in the Olympic Peninsula (Houston et al. 1994). Most goat habitat does not encompass economically valuable natural resources (other than aesthetically valuable ones). A major concern for goat management is increased human access resulting in increased legal harvest, illegal harvest, and disturbance (Fox et al. 1989). In British Columbia, for example, large declines in goat populations are attributed to increased hunter access after new road systems were created in formerly undeveloped areas (Foster 1977).

None of the alternatives propose actively increasing recreational opportunities or improving access to alpine habitats. All alternatives have desired conditions (which are plan components) to return all ecosystems closer to what occurred historically and none promote or encourage a change in human accessibility to or within goat habitat. The current individuals addressed as sensitive in this document are within the Wenaha-Tucannon wilderness, which lies within the Blue Mountains of southeast Washington and contains a considerable amount of habitat suitable for mountain goats (Mathews and Heath 2008). It should also be noted that approximately 65% of source habitats for mountain goats occur in management areas (wilderness, roadless, etc.) that do not anticipate having a high degree of mechanical treatment. This is a population introduced by ODFW and it is using the Grande Ronde River and Wenaha River drainages that border the states of OR and WA and is believed to number about 30 individuals (M. Penninger pers. comm.). The sighting in 2006 of a group of 4 individuals in Washington most likely represents wanderers from this introduced herd (P. Wick pers. Comm.). As can be seen from figure MTGO-2 it is highly unlikely that interaction between mountain goats in the Blue Mountains of Washington with goats

elsewhere in the state would occur due to the amount of non-forest and agricultural lands that would need to be traversed.

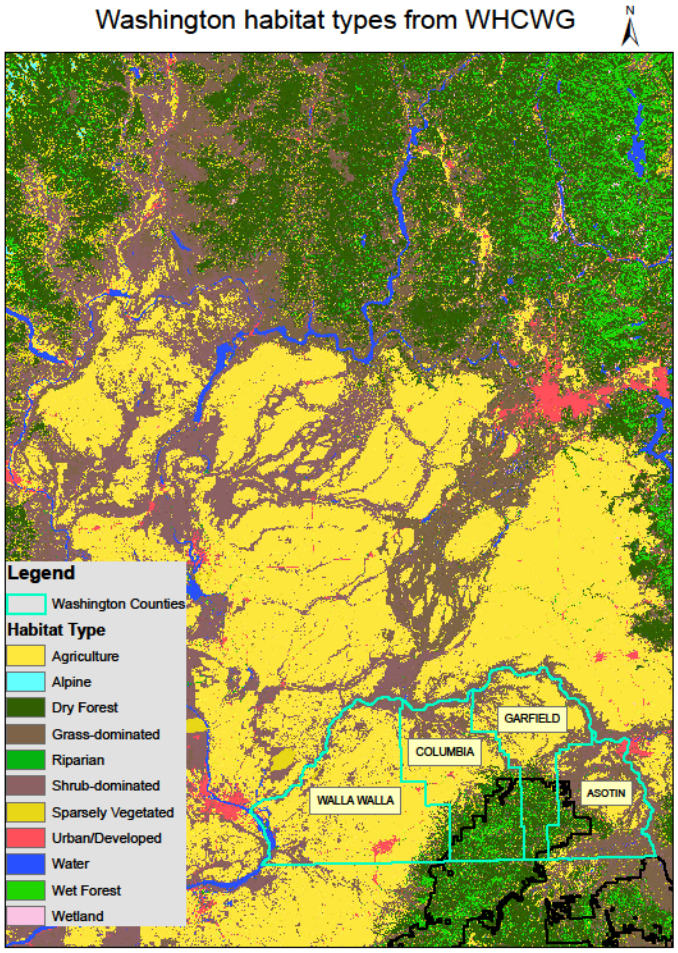


FIGURE MTGO- 2: WILDLIFE HABITATS IN WASHINGTON AS DEPICTED BY THE WASHINGTON HABITAT CONNECTIVITY WORKING GROUP.

In the United States the mountain goat is considered secure (N5); in Washington it is considered between imperiled and vulnerable (S2S3) and Oregon it is considered "exotic" (NatureServe 2012).

Umatilla National Forest

Given the above analysis, status of mountain goats in adjacent states and that the quality of habitat is not expected to be reduced from implementing the plan under any alternative it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. More than 65 percent of the Washington portion of the Blue Mountains is in management areas that are not actively managed (i.e., wilderness or roadless areas).
2. The goats in the Blue Mountains are most likely from the population introduced in Oregon, where NatureServe (2012) considers the species as an exotic.
3. The mountain goat is considered secure nation wide
4. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
5. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

Research indicates mountain goat population are very sensitive to over-harvest, and goats cannot sustain harvest rates typical of other ungulate species (Adams and Bailey 1982; Gonzalez-Voyer et al. 2003). Currently, mountain goat hunting is an once-in-a-lifetime opportunity in Washington. During the 2008 season, only a fraction of the mountain goat range was open to hunting (figure MTGO-3), with 18 permits in 10 goat units, none of which included the Blue Mountains of Washington. Because the goat herd in question is actually from Oregon, the hunting on the Oregon side could also affect the goats in question.

Currently however, no tags are issued for goat hunting in those units that would contain this herd on the Oregon side either. As such, although hunting is cumulative within Washington, it does not impact the sub-population in the Blue Mountains of Washington. Also because most of the mountain goat habitat within the Blue Mountain ecoregion of Washington occurs on forest service lands (figure MGTO-2) there are no significant cumulative effects anticipated to occur on other lands.

FIGURE MTGO-3: MOUNTAIN GOAT DISTRIBUTION (SHADED, EXCLUDING OLYMPIC AND MOUNT RAINIER NATIONAL PARKS) AND AREAS OPEN TO HUNTING (CROSSHATCH) 2008 (TAKEN FROM WDFW 2008A)

Climate change: Because weather affects mountain goat population dynamics, global climate change may potentially affect mountain goat populations (Bowman et al. 2002, Festa-Bianchet and Cote 2007). Global climate change is predicted to increase fall and winter precipitation in the range of mountain goats, resulting in greater snow accumulations. However, increased temperatures predicted by global climate change will probably result in more rain and less snow in winter, shorter duration of snow cover, a prolonged growing season, and an increase in the upper limits of plant growth as glaciers and snowfields recede (Bjork and Molau 2007). As snowfields recede, food availability for mountain goats may increase (Martin 2001, Toweill 2004b), or conversely, food availability may decrease due to increased tree encroachment into subalpine and alpine habitats preferred by mountain goats (Bjork and Molau 2007, Pettorelli et al. 2007, Rochefort et al 1994). Increased tree encroachment may fragment alpine habitats used by mountain goats. This could result in mountain goat populations becoming increasingly isolated from one another, making dispersal more difficult and individual herds becoming smaller and more vulnerable to losses from wildfires, severe winter weather, or diseases and parasites (Mainguy et al. 2007, Martin 2001, Toweill 2004b, Toweill et al 2004).

Woodland-Grass-Shrub Family/Grassland Group

Grasshopper sparrow

Life History and Habitat Description

Although the grasshopper sparrow appears to have a wide distribution across much of temperate North America, it is often locally distributed and even uncommon to rare throughout parts of its range with the main population occurring in the Great Plains, from North Dakota south to northern Texas, and east to

Illinois (Dechant et al. 1998(2002)). Many North American populations have experienced long-term declines since the early part of this century, owing mostly to loss and conversion of prairies and agricultural grasslands (Vickery 1996).

Generally prefers moderately open grasslands and prairies with patchy bare ground; selects different components of vegetation, depending on grassland ecosystem. Occupies lusher areas with shrub cover in arid grasslands of Southwest and West, but selects sparser vegetation in East and Midwest

In Oregon, this species has a restricted distribution and occurs in small numbers. According to Marshall et al. (2003) in northeastern Oregon it is found in scattered colonies on the unforested northern slopes of the Blue Mountains. Holmes and Miller (2010) studied this species on the bombing range in Morrow County and found it to have a strong association with tall perennial bunchgrass communities in this portion of their range, agreeing with other studies. Marshall et al. (2003) recognized the grasshopper sparrow as a very local breeder with small populations appearing in an area, persisting for a few years and then disappearing, only to return at some later date. This probably explains why NatureServe (2012) does not incorporate much of Oregon in the range of this species (Figure GRSP-1). Because the species is migratory, observations in other some parts of Oregon could be seasonal non-breeding resident or as a migratory transient.

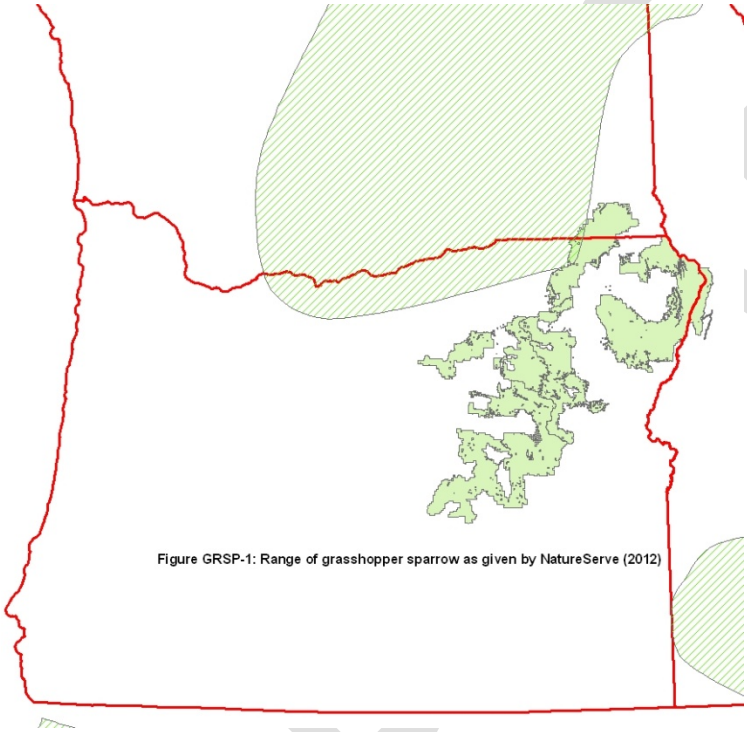


Figure GRSP-1: Range of grasshopper sparrow as given by NatureServe (2012)

Threats

Habitat loss, fragmentation, and degradation are the primary reasons for grasshopper sparrow declines in North America (NatureServe 2012). The conversion of bunchgrass prairies to dryland wheat and other crops is a threat to this species in Oregon (Marshall et al. 2003).

Extensive and intensive grazing in w. North America has had negative impacts on this species (Bock and Webb 1984). In lusher grassland habitats, i.e., tallgrass prairie and eastern hayfields, light to moderate grazing is generally beneficial to grasshopper sparrow, whereas grazing on arid grasslands on shortgrass prairie and in se. Arizona and California is detrimental (Saab et al. 1995), even though intensive grazing has been an important disturbance factor on the shortgrass-prairie ecosystem (Knopf 1994).

Determination of Effects

The northern harrier was the species chosen to represent the grassland group in the Blue Mountains because it is a widely distributed species across grasslands in the planning area. Wales et al. (2011) determined that northern harrier viability will remain the same or improve due primarily to plan components that encourage preventing invasive exotics, likely the main threat to loss of this habitat type. They also recognized that the Forest Service manages relatively few acres of this habitat type and that the majority occurs on private lands. Several studies have confirmed an association of the grasshopper sparrow with sparse vegetation and patchy bare ground, characteristics typical of bunchgrass grasslands

(Vickery 1996, Reinking 2005, Powell 2008). Bunchgrass communities comprise less than 14,000 acres on the Malheur National Forest.

Grazing in sparse, arid grasslands can be detrimental, as vegetation may become too short and open for grasshopper sparrow use (Bock et al. 1984, Bock and Webb 1984, Bock et al. 1993). However, in areas where grass is too tall or dense, grazing benefits grasshopper sparrows by creating patchy areas, decreasing vegetation height, and thinning dense vegetation (Skinner 1974, Kantrud 1981, Whitmore 1981). Kantrud and Kologiski (1982) found significantly greater Grasshopper Sparrow densities on lightly grazed plots than on heavily grazed plots, and moderately grazed plots supported intermediate sparrow densities. In north central Colorado, grasshopper sparrows were found on prairie that was heavily grazed in the winter, but not on prairie that was heavily grazed in the summer (Wiens 1970).

The grasshopper sparrow is considered secure (NatureServe 2012) both globally (G5) and nationally (N5B; N5N). The Oregon population is considered imperiled (S2) and the Washington population is considered vulnerable (S3).

Malheur National Forest

Species is suspected to occur on the Malheur National Forest. Given the above, the results of the focal species assessment model for the sage thrasher, there is little proposed management in the potential source habitat that is expected to negatively affect this species under any alternative, and that the quality of habitat is not expected to be reduced from implementing the plan under any alternative it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. The focal species assessment model for this group indicated no change in the concern for viability within the plan area.
2. The grasshopper sparrow has a large range throughout North America.
3. Habitat for this species is extremely limited on the Malheur National Forest
4. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
5. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Umatilla National Forest

Species is not known or suspected to occur on the Umatilla National Forest

Wallowa-Whitman National Forest

Species is not known or suspected to occur on the Wallowa-Whitman National Forest

Cumulative Effects on species

Because there are essentially no data on winter mortality and survivorship for this species (only 1 study of adult male survivorship: Delany et al. 1993), it is impossible to adequately determine whether reproductive failure or winter survival has a greater influence on this species' population regulation. Research on winter mortality and survivorship is urgently needed.

The vast majority of habitat occurs on private lands and it is not anticipated that major changes in management of these lands will occur. They do breed in both native and tame grassland vegetation, so programs like the Conservation Reserve Program can be beneficial (Dechant et al. 1998(2002)).

Chambers-Caves Family/Chambers-Caves Group

Townsend's Big-Eared Bat

Life History and Habitat Description

Townsend's big-eared bats have been reported from sea level to 3,300 meters in a wide variety of habitat types including coniferous forests, mixed meso-phytic forests, deserts, native prairies, riparian communities, active agricultural areas, and coastal habitat types (Piaggio and Sherman 2005; Kunz and Martin 1982). Distribution is strongly correlated with the availability of caves and cave-like roosting habitat, including abandoned mines (Sherwin et al 2000; Pierson et al 1999; Gruver and Keinath 2006). Along the Pacific coast this species has been found roosting in buildings, generally in open attics (Brown et al. 1994; Pearson et al. 1952). Fellers and Pierson (2002) found males of this bat species roosting in a large hollow tree in the coastal area of California; although the majority of the bats they studied returned to the maternity roost- an abandoned building. Foraging associations include: edge habitats along streams, or adjacent to and within a variety of wooded habitats (Gruver and Keinath 2006). *Corynorhinus townsendii* is a moth specialist, with more than 90 percent of the diet consisting of lepidopterons (reviewed in Pierson et al. 1999).

C. townsendii populations appear to be quite sedentary, with marked animals (all females) not known to move more than a few kilometers from their natal roost. Banding, light-tagging and radio tracking studies suggest that movement in the nursery season, either for foraging or shifting to an alternate roost, is confined to within 15 km of the primary roost (Brown et al., 1994; Pearson et al., 1952; Humphrey and Kunz, 1976). Seasonal movements also appear to be limited with hibernacula usually located within 3 to 64 km from their summer roosts (Gruver and Keinath 2006).

Townsend's have been noted foraging in a wide variety of habitats (Pierson et al. 1999) throughout its western range, and this may reflect the need to roost where structures are available as opposed to within a particular vegetative zone (Gruver and Keinath 2006). Suitable foraging habitat is likely to be a heterogeneous mosaic of forested and edge habitats, including riparian zones, which are also used for commuting and drinking (Fellers and Pierson 2002).

Threats

According to Piaggio and Sherman (2005) the primary threat is almost certainly related to disturbance and/or destruction of roost sites (e.g., recreational caving or mine exploration, mine reclamation, and renewed mining in historic districts). Surveys conducted in Oregon and California indicate that current and historic roost sites have been negatively impacted by human visitation and renewed mining in recent years with most reported colonies exhibiting moderate to sizable reduction in numbers (Pierson and Rainey 1998; Perkins 1998). It is well documented that *C. townsendii* maternity colonies are highly sensitive to human activities, and that even modest disturbance can lead to roost abandonment (Pearson et. al 1952; Humphrey and Kunz 1976; Pierson and Rainey 1996; Gruver and Keinath 2002). Roads may indirectly affect bat species by increasing human access to roost sites.

Loss or modification of foraging habitat can also be detrimental (Gruver and Keinath 2002). Townsends do not use large clear-cuts or regenerating stands. Activities that reduce the productivity of riparian areas probably impact Townsend's by reducing prey availability and drinking sites.

Determination of Effects

The Townsend's bat was the focal species identified for the Blue Mountains for this group. A focal species assessment model was not built for any of the bat species. It was felt that the knowledge to adequately map habitat and develop a model at this scale for these species did not exist (Wales et al. 2011). Wales et al. (2011) did conclude that it was *"not likely that management activities described in the proposed action or any of the alternatives will lead to an increased risk to the viability of any of the bat species of conservation concern."*

A 1989-1990 survey of 14 localities in Oregon and Washington indicated that over a 5-year period populations rapidly decreased at 8 sites; 6 populations, receiving moderate to high protection, were stable or increasing (Perkins 1990). A 1994 survey of one Oregon locality indicated a decline in 4 of 5 caves (Perkins 1994).

No management activities are proposed in any of the alternatives at potential caves or mines within any of the alternatives. All alternatives consider caves as special habitats with a desired condition that they remain persistent on the landscape and provide high quality habitat for associated species. Additionally alternatives B, C, E, and F have a guideline that bat maternity and roost sites should not be disturbed (WLD-HAB-18 G-7) and alternative C has a standard to survey for presence of all bats prior to potentially disturbing activities (WLD-HAB-23 *New*). Further direction would be provided in WLD-HAB-6 S-1 for alternatives B, C, D, E, F which is a standard to protect (within 1200 feet) known nesting, roosting or denning sites of sensitive species.

Although treatment is anticipated within foraging habitat for this species, it is to be undertaken with the intent of restoring vegetation to what was expected to occur historically. Additional plan components in the form of standards and guidelines have also been incorporated to improve riparian conditions as well. In many instances this should lead to improved forage habitat for this species.

Townsend's big-eared bat is considered between imperiled and vulnerable (S2S3) in Washington and imperiled in Oregon (S2). Globally it is considered vulnerable (G4) and it is considered between vulnerable and apparently secure (N3N4) nationally (NatureServe 2012).

Malheur National Forest

Townsend's big-eared bats have been documented at three locations on the Emigrant Creek Ranger District. Given the analysis above and that the quality of habitat is not expected to be reduced from implementing the plan under any alternative it is likely that proposed management activities **may impact** individuals or habitat under any alternative but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Wales et al. (2011) assessment for this group indicated no change in the concern for viability within the plan area.
2. The Townsend's big-eared bat has a large range throughout western North America.
3. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
4. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Umatilla National Forest

The Townsend's big-eared bat is known to occur in abandoned mines particularly in the Granite Creek area of the Forest.

Given the analysis above and that the quality of habitat is not expected to be reduced from implementing the plan under any alternative it is likely that proposed management activities **may impact** individuals or habitat under any alternative but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Wales et al. (2011) assessment for this group indicated no change in the concern for viability within the plan area.
2. The Townsend's big-eared bat has a large range throughout western North America.
3. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
4. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Wallowa-Whitman National Forest

The Townsend's big-eared bat is known to occur in abandoned mines and caves in several areas across the forest. In particular these bats have been found along the Snake and Imnaha Rivers.

Given the analysis above and that the quality of habitat is not expected to be reduced from implementing the plan under any alternative it is likely that proposed management activities **may impact** individuals or habitat under any alternative but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Wales et al. (2011) assessment for this group indicated no change in the concern for viability within the plan area.
2. The Townsend's big-eared bat has a large range throughout western North America.
3. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
4. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

Locatable mineral development is authorized under the US mining laws however, unless valid rights exist, some areas within the national forest have been withdrawn from mineral development (e.g., wilderness, wild river corridors). Locatable mineral development is highly dependent upon global mineral commodity values, which greatly determines the number of claims active at any one time. Although it is not anticipated that large numbers of abandoned mines would be re-opened, with the rising price of gold the level of interest and inquiries from the public has increased in recent years. This could lead to mines both on NFS lands and private lands becoming active again during the life of the plan.

Riparian Family/Conifer Riparian Group

Rocky Mountain Tailed Frog

Life History and Habitat Description

Rocky Mountain Tailed Frogs (*Ascaphus montanus)* are primarily nocturnal, and live in fast-flowing headwater streams in old-growth forests (Nielson et al, 2001). Mating, egg-laying, and larval development occur in streams. Adult female frogs deposit egg masses beneath large relatively stable cobbles or boulders in the summer and hatchlings emerge the following spring. At northern latitudes it takes up to four additional summers for tadpoles to metamorphose and begin a life of both lotic and terrestrial activity (Daugherty and Sheldon 1982, Brown 1990). Thus the larval life stages are particularly vulnerable to land uses that alter channel conditions (Bury 1983, Corn and Bury 1989, Bull and Carter 1996, Welsh and Ollivier 1998, Dupuis and Steventon 1999, Aubry 2000).

They occur in very cold, fast-flowing streams that contain large cobble or boulder substrates, little silt, and are often darkly shaded (Bull and Carter 1996). Hatchlings are striking because they have no pigment and are almost transparent. Tailed frogs develop very slowly in the cold water, and tadpoles are two to five years old before they metamorphose (Corkran and Thoms 1996). Juveniles take another few years to reach sexual maturity. Tadpoles cling to the undersides of submerged moss-free boulders and cobbles. Adults often occur on stream banks at night and during wet weather.

Threats

Tailed frog populations are sensitive to the increased siltation and water temperatures that may accompany timber harvest, being found most often in old growth reaches of streams (Bury 1983; Corn and Bury 1989; Welsh 1990; Walls et al. 1992). This has generated concern over the loss and fragmentation of old growth habitat in the Pacific Northwest and the effect this may have on populations of tailed frogs (Bury 1983; Corn and Bury 1989; Welsh 1990; Walls et al. 1992; Blaustein et al. 1994).

While no studies were found on the effects of grazing on tailed frogs, several studies have shown that livestock grazing can change the composition and quality of riparian habitats, cause soil compaction, and stream bank trampling (see Krausman 1996 and Wales 2001 for reviews). Of particular importance is the potential for grazing to contribute sedimentation to stream providing tailed frog habitat (Waters 1995, Welsh and Ollivier 1998).

Roads can influence riparian habitats for amphibians by removing habitat, limiting the ability of amphibians to disperse, creating a source of mortality and as a source of fine sediment deposited in amphibian habitats (deMaynadier and Hunter 2000, Dupuis and Steventon 1999, Fahrig et al. 1995, Welsh and Ollivier 1998, Yanes et al. 1995). Research has indicated the potential for reduced snag abundance along roads (Bate et al. 2007, Wisdom and Bate 2009) which would likely lead to reduced down-log densities.

<u>Determination of Effects</u>

A focal species assessment model was developed and analyzed for Rocky Mountain tailed frogs across the range of the species within the Umatilla and Wallowa-Whitman National Forest s (see Wales et al. 2011). The risk and habitat quality factors included in the models were grazing, habitat effectiveness and presence of invasive animals (e.g. trout). Source habitat was defined as within 100m of class 1-3 streams, tree size >=15", and canopy closure >60% in the cool moist and cold dry PVGs. The viability outcomes for historical were primarily an A. On the Umatilla, the current outcome is primarily a B/A and on the Wallowa-Whitman National Forest it is primarily a C outcome indicating that habitat conditions have decreased for this species since historical. A 'C' outcome indicates suitable environments are moderately

distributed and/or exist at moderate abundance relative to historical conditions. Declines in the outcomes currently were due to risk and habitat quality factors as the amount of habitat was not assumed to have changed since historical.

Based on the desired conditions and goals of all alternatives, it is unlikely there will be a reduction in the amount of source habitat or increased risk to the quality of this habitat due to the implementation of any of the forest plan alternatives. In all likelihood the viability of this species may improve under all alternatives due to the attention placed on improving riparian area and function where much of this species habitat is located. Livestock grazing (area and/or intensity) under Alt C is greatly reduced from current levels, especially in riparian source habitat. Alt. C provides the highest degree of riparian habitat protection and restoration including the potential for reduced road densities.

All action alternatives establish Riparian Management Areas that have several standard and guidelines that should alleviate some of the risks posed to tailed frogs. All alternatives have RMAs that would encompass the entire modeled habitat for this species except alternative D. Alternative A has several standard and guidelines with similar intent to protect riparian areas in RHCAs.

Riparian areas, lakes, and wetlands are protected under all management direction. Executive Order 11190 (Carter 1977) also limits the loss or conversion of this type of habitat.

Table RT-1: Level of viability concern by national forest for the Rocky Mountain tailed frog currently and projected for each alternative.

National Forest	Current	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
Umatilla	L	L	L	L	L	L	L
Malheur	NA	NA	NA	NA	NA	NA	NA
Wallowa-Whitman	M	M	M	M	M	M	M

The Rocky Mountain tailed frog is considered apparently secure (NatureServe 2012) both globally (G4) and nationally (N4). The Oregon population is considered imperiled (S2) and the Washington population is considered possibly imperiled (S2?).

Malheur National Forest

The Malheur National Forest is outside the historical range of the tailed frog.

Umatilla National Forest

The tailed frog has been documented on the Pomeroy Ranger District and the Walla Walla Ranger District. Given the above, the results of the focal species assessment model, and that the quality of habitat is not expected to be reduced from implementing the plan under any alternative it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. The focal species assessment model for this species indicated no change in the concern for viability within the plan area.
2. All alternative except D, incorporate the majority of tailed frog habitat into MA 4B (Riparian Management Areas).
3. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.

4. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Wallowa-Whitman National Forest

Tailed frog surveys across the Wallowa-Whitman National Forest area have found this species to be common in high elevation streams (Bull and Carter 1996). They have been found in every county and ranger district. Given the above, the results of the focal species assessment model, and that the quality of habitat is not expected to be reduced from implementing the plan under any alternative it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. The focal species assessment model for this group indicated no change in the concern for viability within the plan area.
2. All alternative except D, incorporate the majority of tailed frog habitat into MA 4B (Riparian Management Areas).
3. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
4. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

There are no anticipated cumulative effects anticipated for this species, since the majority of habitat occurs on national forest lands.

Black Swift

Life History and Habitat Description

This swift occurs widely throughout western North America in summer, with its breeding range extending as far north as southeastern Alaska, as far east as central Colorado, and south through Mexico and Central America to Costa Rica (Lowther and Collins 2002) . Despite this extensive distribution, only about 100 specific nesting localities have been documented (Lowther and Collins 2002, Levad et al. 2008); most nesting sites are associated with sheer cliffs and waterfalls. Nowhere in this range is it considered to be an abundant summer resident. Black swifts nest on ledges or shallow caves in steep rock faces and canyons, usually near or behind waterfalls and typically inaccessible due to steep and vertical configuration (Levad et al. 2008).

Their preference for damp cliffs (e.g., near waterfalls) in montane areas (inland populations) and for damp coastal caves (coastal populations) as nesting sites has led to a patchy breeding distribution within North America (Wiggins 2004)

Critical factors for nest locations in other states appear to be temperature with little or no direct solar exposure and high humidity which help attach nest to substrate (Marin 1997).

Black swifts breed in the Cascades of western Oregon, although only one definite breeding site has been identified (Marshall et al. 1996) and probably the Wallowa Mountains of northeastern Oregon (Gilligan et al. 1994).

Threats

Few threats are documented for this species though inland waterfall nesting sites are often popular destination of hikers; 1 egg destroyed by rock thrown into nest (Foerster 1987).

Determination of Effects

Black swifts are rare within the planning area. They were identified as a focal species in the R6 Terrestrial Species Assessment (USDA 2010), but due to their limited distribution and unique habitat within the planning area, a focal species assessment model was not developed. This species is in the same Group as the Rocky Mountain tailed frog (Conifer Riparian) whose viability showed declines from historical levels due to livestock grazing, reduced habitat effectiveness and introduced trout. None of these risk/habitat quality factors are known to affect Black swifts. Likely the viability of this species on NFS lands has not changed compared to the historical condition.

Alternatives B, C, D, E, and F have a standard to protect (within 1200 feet) known nesting sites of sensitive species (WLD-HAB-6 S1).

The effect of potential risk factors is unknown; however no current management practices by the Forest Service have been identified as causing a negative risk to this species. The viability of black swifts is not expected to change due to any management activities (or other reasons) on lands managed by the Forest Service. It is not likely that management activities described in any of the alternatives will have any effect on black swift or their habitat in any of the 3 planning areas.

The black swift is considered apparently secure nationwide (N4B), imperiled in Oregon (S2B) and at risk (S3B) in Washington.

Malheur National Forest

Species is not known to occur on the Malheur National Forest.

Umatilla National Forest

Species is not known to occur on the Umatilla National Forest.

Wallowa-Whitman National Forest

These birds were first recorded in the summer of 2007 at Falls Creek falls on the Wallowa-Whitman National Forest, where 10 to 12 black swifts were recorded. Given that nesting habitat is inaccessible and that the quality of foraging habitat is not expected to be reduced from implementing the plan under any alternative it is likely that proposed management activities under any alternative will have **no impact** on individuals, their habitat, or viability of the population or species.

Because:

1. The focal species assessment model (tailed frog) for this group indicated no change in the concern for viability within the plan area.
2. Nesting habitat for this species is relatively inaccessible to human activity.
3. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
4. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

The winter range for this species is poorly known though it is thought that northern populations may winter in South America (Beason et al. 2012). The current rate of deforestation in Brazil and the current climate change and global warming pose both direct and indirect threats to this species (Beason et al. 2012). Because of its very specific nesting habitat and its relative inaccessibility there are no anticipated cumulative effects for the breeding population in Oregon.

Riparian Family/Riparian-Large Tree or Snag-Open Water Group

Bald Eagle

Life History and Habitat Description

The bald eagle (*Haliaetus leucocephalus*) ranges throughout much of North America, nesting on both coasts and north into Alaska, and wintering as far south as Baja California. The largest breeding populations in the contiguous United States occur in the Pacific Northwest states, the Great Lakes states, Chesapeake Bay, and Florida. Oregon and Idaho are important for wintering bald eagles. Bald eagle populations have made substantial recoveries in recent years. Formerly listed as endangered in 1978, the bald eagle was down-listed to threatened status in the lower-48 states in 1995. In March 1999, the USFWS proposed to de-list the bald eagle throughout its entire range. A final rule on the delisting proposal was made in June 2007 and the bald eagle is now listed as sensitive by the Forest Service. The ESA requires the Service to monitor the status of a de-listed species for a minimum of 5 years to determine if the species should require protection of the Act.

Bald eagle occurrence in the planning area varies by season and includes breeding, migrating and wintering populations. The breeding season begins in late February or March, with juveniles fledging between mid-July and early September. They generally leave the nest area between late August and late September. Migration generally peaks during March-April in the spring, and October-November in the fall.

Habitat

Bald eagles are highly dependent on riparian habitats. Nesting territories are normally associated with lakes, reservoirs, rivers, or large streams. In the Pacific Northwest recovery area the preferred nesting habitat for bald eagles is predominately uneven-aged, mature coniferous (ponderosa pine and Douglas-fir) stands or large black cottonwood trees along a riparian corridor (NatureServe 2012, USDI 1986). Although highly associated with riparian areas, several studies have reported the importance of late-successional forests in defining quality of nesting habitat and influencing productivity of bald eagles (Anthony and Isaacs 1989, Garrett et al. 1993). Eagles usually nest in mature conifers with gnarled limbs that provide suitable platforms for nests. Trees selected for nesting are characteristically the largest in the stand or at least co-dominant with the overstory. Nest trees usually provide an unobstructed view of the associated water body and are often prominently located on the topography. They also tend to be found in relatively remote areas that are free of disturbance. The size and shape of a defended breeding territory varies widely (1.6 to 13 square miles) depending upon the terrain, vegetation, food availability, and population density of an area (USDI 1986). Adults tend to use the same breeding areas year after year, and often the same nest, though a breeding area may include one or more alternate nests.

The most common food sources for bald eagle in this region are fish, waterfowl, rabbits, and various types of carrion (NatureServe 2012, USDI 1986). The main food source for bald eagles during the breeding season is fish; therefore, habitat of most importance during this period consists of areas near large bodies of water and major river systems.

During the critical incubation (March) and brooding (late April/early May) phases, human disturbance can result in nest failure with the risk reduced as the nesting cycle progresses towards fledgling at the end of July. Some habituation of eagles to human activity has been observed, varying according to type and proximity to the nest. Individual birds vary widely in their response to human disturbance. (USDI 1986)

Wintering eagles tend to perch on dominant trees that provide a good view of the surrounding area and close to a food source such as carrion, fish, etc. (NatureServe 2012, USDI 1986). A communal roost generally hosts several eagles each evening at the same site during the winter months. Communal night roosts are generally near a rich food source (high concentrations of waterfowl or fish) and in forested, uneven-aged stands with a remnant old growth component (Anthony and Isaacs 1989). Communal winter roosts tend to be isolated from disturbance and offer more protection from the weather than diurnal roosts (NatureServe 2012, USDI 1986).

Threats

The three main factors that influence the location of nests and territories include 1) proximity of water and availability of food; 2) availability of nesting, perching, and roosting trees; and 3) the density of breeding-age bald eagles in the area (Stalmaster 1987). Reported responses of bald eagles to human disturbances have ranged from spatial avoidance of the activity to reproductive failure (Anthony et al. 1995, Buehler et al. 1991, McGarigal et al. 1991, Watson 1993), although in some cases, bald eagles tolerate human disturbances (Steidl and Anthony 2000). Bald eagles seem to be more sensitive to humans afoot than to vehicular traffic (Grubb and King 1991, Skagen et al. 1991, Stalmaster and Newman 1978). Fletcher et al. (1999) reported that the abundance of bald eagles was lower in riparian habitats with nonmotorized trails compared to riparian habitats without trails. Recommended buffer distances to reduce the potential for disturbance to bald eagles during the nesting period have ranged from 300 to 800 meters (Anthony and Isaacs 1989, Fraser et al. 1985, McGarigal 1988, Stalmaster 1987). Grubb and King (1991) evaluated the influence of pedestrian traffic and vehicle traffic on bald eagle nesting activities and recommended buffers of 550 meters for pedestrians and 450 meters for vehicles. Anthony and Isaacs (1989) reported that nest sites in older contiguous forest habitats with low levels of human disturbance resulted in higher levels of bald eagle productivity.

The guidelines for management published in the bald eagle recovery plan (USDI 1986) were replaced with the National Bald Eagle Management Guidelines (USFWS 2007) when the eagle was delisted. Recommendations to avoid disturbing nesting bald eagles were (1) keeping a distance between the activity and the nest (distance buffers), (2) maintaining preferably forested (or natural) areas between the activity and around nest trees (landscape buffers), and (3) avoiding certain activities during the breeding season. The buffer areas serve to minimize visual and auditory impacts associated with human activities near nest sites. Ideally, buffers would be large enough to protect existing nest trees and provide for alternative or replacement nest trees.

Determination of Effects

A focal species assessment model was developed and analyzed for bald eagles across the 3 planning areas (see Wales et al. 2011). Source habitat was identified as areas below 6,000 feet elevation within a 300 m. buffer of a body of water at least 5 acres in size (including large stream/river reaches). Tree size class was >=15” DBH in the dry and cool moist forest PVGs. Risk and habitat quality factors included in the models were the amount of source habitat that was in late succession (>=20” DBH, and >=40 % canopy closure) and amount of source habitat within the zone of influence for motorized (450 meters) and non-motorized (550 meters) travel ways. Model results indicate that human activities are having an impact on the effectiveness of source habitat for bald eagles across the planning area. Activities associated with roads and trails have reduced habitat effectiveness in most of the watersheds analyzed. The amount and distribution of habitat was assumed not to have changed from historical conditions. The distribution of

habitats across the planning area was assumed to be moderate on the Wallowa-Whitman and Umatilla National Forests, and well distributed on the Malheur National Forest.

Table BE-1: Level of viability concern by national forest for the bald eagle currently and projected for each alternative.

Common Name		Current	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
Bald Eagle	Umatilla	L/M	L/M	L/M	L/M	L/M	L/M	L/M
	Malheur	L	L	L	L	L	L	L
	Wallowa-Whitman	M	M	M	M	M	M	M

The main factors that may affect this species are change in the amount of potential nesting habitat in riparian areas and any change in habitat effectiveness. All alternatives establish Riparian Management Areas that have several standard and guidelines that should alleviate some of the risks posed to bald eagles. The desired condition under all action alternatives is to maintain or increase the extent and diversity of wetlands within the Blue Mountains (1.1.3 Wetland function) and Executive Order 11190 (Carter 1977) limits the loss or conversion of this type of habitat. According to several landscape assessments (Quigley and Arbelbide 1997; ODFW 2006; Oregon Biodiversity project 1998) most remaining high quality wetlands in the Blue Mountains are on BLM or Forest Service lands and recognize that wetland losses have occurred but unanimously refer to the draining and conversion to agriculture within the valleys (La Grande and Baker) and lower elevation wetlands. Although the width of Riparian Management Areas (MA 4B) will vary between alternatives, the desired conditions for riparian habitat is the same whether it occurs within an RMA or not.

None of the alternatives anticipate alteration of stand structure and composition in riparian areas except as necessary to maintain, restore or enhance conditions that are needed to support aquatic and riparian dependent resources. Additionally, the preference by bald eagles for nesting in large trees should be benefitted by emphasis to protect large trees, snags and old forest. In addition to desired conditions there are also Standards and Guidelines likely to benefit bald eagles under some alternatives.

Habitat effectiveness should also improve or be maintained under all alternatives as all alternatives envision little new road construction in RMAs (Alt B, C, D, E and F; KW-1S-15) or RHCAs (Alt A; RF-1) All alternatives actually envision a reduction of roads open to the public compared to existing conditions, except alternative D which maintains the existing condition. In general, alternative C proposes the most reduction in road density, if this occurs in riparian areas near to potential source habitat, this should benefit this species. Alternatives B, C, D, E, and F also have a standard to protect (within 1200 feet) known nesting and/or roosting sites of sensitive species (WLD-HAB-6 S-1).

Much of the source habitat is located within or in close proximity to both key watersheds and RMA's, and based on the desired conditions, objectives and standards and guidelines the risk of decreased habitat effectiveness for bald eagles is low. No human activities from any alternative would likely decrease the amount and timing of fish, waterfowl, or big game carrion available to bald eagles. The following table describes a variety of standards and guideline that are incorporated in the various alternative that would allow further protections for this species.

Both the breeding and non-breeding populations within the United States are considered secure (N5B, N5N), much of which is a result of the rangewide improvement in numbers and the protection offered by governments. Within Oregon and Washington the breeding and non-breeding populations are considered apparently secure (S4B, S4N).

WLD-HAB-2 G-2	**Guideline** The extent of existing late old structure stands within the moist and cold old forest types that are 300 acres or larger should not be reduced or fragmented.

WLD-HAB-3 G-3	**Guideline** Riparian corridors connecting moist and cold old forest types should not be reduced.
WLD-HAB-12 S-7	**Standard** Where management activities occur within dry or cool moist forest habitat, all snags 21 inches DBH and greater and 50 percent of the snags from 12 to 21 inches DBH shall be retained, except for the removal of danger/hazard trees. Snags shall be retained in patches.
OF-1 G-59	**Guideline** Management activities within or outside old forest stands should retain live old forest trees ≥ 21 inches d.b.h. Exceptions include: • Tree(s) need to be removed to favor hardwood species, such as aspen or cottonwood, or other special plant habitats • Late seral species, such as grand fir, are competing with large diameter early seral species, such as ponderosa pine • Tree(s) need to be removed to reduce danger/hazard trees along roads and in developed sites • A limited amount of old forest trees need to be removed where strategically critical to reinforce and improve effectiveness of fuel reduction in wildland-urban interfaces
MA 4B RMA-FOR-1 G-112	**Guideline** Timber harvest and thinning should occur in RMAs only as necessary to maintain, restore or enhance conditions that are needed to support aquatic and riparian dependent resources.
OF-2 *New* *New*	**Guideline** New motor vehicle routes should not be constructed within old forest stands.
WLD-HAB-6 S-1	**Standard** Activities that have potential to cause abandonment or destruction of known denning, nesting, or roosting sites of threatened, endangered, or sensitive species shall not be authorized or allowed within 1,200 feet of those sites.
KW-1 S-15	**Standard** There shall be no net increase in the mileage of Forest Roads in any key watershed unless the increase results in a reduction in road-related risk to watershed condition. Priority should be given to roads that pose the greatest relative ecological risks to riparian and aquatic ecosystems.

Malheur National Forest

Bald eagles roost in trees along the southern edge of the Malheur National Forest (Emigrant Creek Ranger District) during winter months; all roosts are in mature stands of ponderosa pine along streams. Active roost sites are managed jointly with the Bureau of Land Management. Bear Valley (managed by the Bureau of Land Management) is used as an inland wintering ground for bald eagles.

Of over 300 records in the Forest database, the majority of bald eagle observations were from BLM-managed lands in Bear and Silvies Valleys. The majority of winter roost sites on the Malheur National Forest cannot be accessed by vehicles. It has been over 10 years since bald eagles have been seen in the Ochoco eagle roost; wildfire in 1990 essentially eliminated the roost (R. Sutcliffe pers. comm.).

Given the analysis above, the results of the focal species assessment model, and that quality of habitat is not expected to be reduced from implementing the plan under any alternative it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. The focal species assessment model for this species indicated no change in the low level of concern for viability within the plan area.
2. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.

3. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Umatilla National Forest

One bald eagle nest has been documented on the south end of the forest. Bald eagle wintering habitat is present along the Middle Fork John Day River. Wintering bald eagles are commonly noted along the river between the months of November and March.

Given the analysis above, the results of the focal species assessment model, and that quality of habitat is not expected to be reduced from implementing the plan under any alternative it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. The focal species assessment model for this species indicated no change in the low to moderate concern for viability within the plan area.
2. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
3. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Wallowa-Whitman National Forest

The Wallowa-Whitman National Forest has three known bald eagle nest sites. Two were discovered in the late 1980s and are located in mainly open ponderosa pine forest. The third bald eagle nest is near the Hells Canyon Dam and is outside the project area.

There is one designated bald eagle winter roost site on the WW National Forest. The Salmon Creek Bald Eagle Winter Roost site is closed to motorized use from December 1 to May 1 each year. Although there is only one designated winter roost site, bald eagles probably roost in various other places throughout the Forest during winter months. Eagles often utilize private lands in the valleys during the day and fly to different roost areas on the Forest in the evening which varies from year to year. The majority of the bald eagle migration and winter sightings are within the Baker Valley and along the Grande Ronde and Snake Rivers.

Given the analysis above, the results of the focal species assessment model, and that quality of habitat is not expected to be reduced from implementing the plan under any alternative it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. The focal species assessment model for this species indicated no change in the moderate concern for viability within the plan area.
2. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
3. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

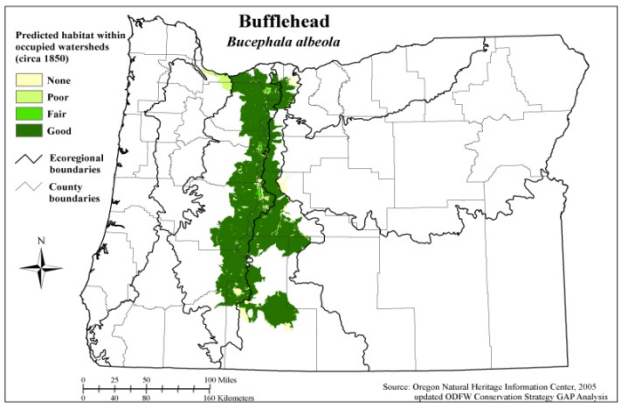
Cumulative Effects on species

Although there are several private land initiatives to improve riparian habitats, there are no anticipated changes to management of non-federal lands that would result in sufficient habitat changes that would translate into cumulative effects and therefore none are anticipated.

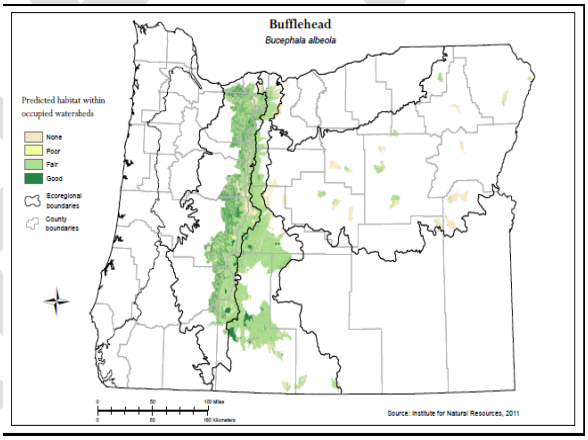
Bufflehead

Life History and Habitat Description

The bufflehead nests near high mountain lakes surrounded by open woodlands. Buffleheads are cavity nesting ducks that are highly territorial (Gauthier and Smith 1987). They are the smallest diving ducks allowing them to nest in small cavities excavated by northern flickers. Buffleheads eat crustaceans and aquatic insects during the nesting season and seeds of pondweeds and bulrushes (Gauthier 1993). Although widely distributed throughout the state during winter, frequenting open waters on major rivers and lakes, breeding buffleheads are rare (Oregon Wildlife Explorer 2013). Based on the maps below, it appears as if it did not occur historically within the Blue Mountains. Gauthier (1993) indicates the Blue Mountains as non-breeding range for this species, with breeding individuals occurring only in the Cascades of Oregon as does NatureServe (2012).



Historic Habitat Map



Current Habitat Map

Snags are an important habitat attribute for buffleheads. In order to put availability of snags in context, Region 6's decayed wood advisor (DecAID) was consulted. DecAID (Mellen-McLean et al. 2012) is an advisory tool to help managers evaluate effects of forest conditions and existing or proposed management activities on organisms that use snags and down wood. DecAID also can help managers decide on snag and down wood sizes and levels needed to help meet wildlife management objectives. It can help managers articulate those objectives in specific, quantitative terms that could be tested in the field. In this way, the name "DecAID" can be read as decayed wood advisor and management aid ("decay-aid" or "decision-aid"). The DecAID Advisor can help long-term planning, as over "decades" of time. Data is not available for buffleheads and only available for the northern flicker in post-fire habitats. As such, what is presented is for the western bluebird since a close relative, the mountain bluebird is considered a competitor with the bufflehead for nest sites.

Table TW7 displays the snag levels analyzed for the western bluebird and how they compare to what would be expected across the landscape based on Mason and Countryman (2010). It is important to note that because of the categories used in Mason and Countryman (2010), all three levels for ponderosa pine fall in the same category (zero to two snags per acre) and therefore the landscape percentages are the same. What it does point out is that high snag levels in the dry PVG approximate what would be expected across the landscape historically. However, when compared with the analysis at the watershed level (Wales et al. 2011) only three percent of the watersheds within the Malheur National Forest have 50 percent or more of source habitat with high or very high snag densities, indicating a distribution problem. Wales et al. (2011) estimated that historically half of source habitat would have had snag densities of one snag per acre or less and half would have snag densities greater than one snag per acre..

Table TW7. Snag density per acre for 30, 50, and 80 percent tolerance levels for the western bluebird as described in DecAID, percent of the landscape that historically met these levels, and percent of the landscape that currently meets these levels for the Malheur National Forest (Mason and Countryman 2010)

DBH (inches)	PVG Associations	Tolerance levels from unharvested inventory plots[1]			Percent of landscape that historically met species tolerance levels[2]			Percent of landscape that currently meets species tolerance levels[3]		
		30%	50%	80%	30%	50%	80%	30%	50%	80%
≥ 20	Ponderosa pine/Douglas-fir	0.0	0.0	1.1	79%	79%	79%	82%	82%	82%
≥ 20	Eastside mixed conifer	0.0	0.8	5.5	62%	62%	24%	61%	61%	20%

[1] From DecAID Figure PPDF_O.inv-3 and EMC_ECB_O.inv-3
[2] From tables 8 and 9 in Mason and Countryman (2010)
[3] From tables 14 and 15 in Mason and Countryman (2010)

Threats

A game species in Oregon, this species is wary of humans, and recreational pressure around mountain lakes may impact populations. There may be a lack of suitable nesting cavities due to removal of dead trees (Gauthier 1993) although a study in British Columbia, Canada found an excess of suitable nesting cavities and concluded that territorial behavior might have been limiting the breeding density of this population (Gauthier and Smith 1987). Snags are often lost due to timber harvest and fuelwood cutting. Bate et al. (2007) and Wisdom and Bate (2008), found that snag numbers were lower adjacent to roads due to safety considerations, firewood cutters, and other management activities indicating that roads are an indirect threat to snag abundance.

In some areas density may be limited by goldeneyes since buffleheads are supplanted by goldeneyes during territorial conflicts (Savard 1984; Savard et al. 1991), however according to Eadie et al. (1995), goldeneyes do not breed in Oregon.

Determination of Effects

Bufflehead ducks are in the Riparian Family and the Group Large Tree or Snag/Open Water. The bald eagle was chosen and the focal species for this group and a focal species assessment was completed. Buffleheads use habitats similar to bald eagles, although breeding habitats are more restricted and they also react negatively to human disturbance. It is expected that the bufflehead duck would have a similar trend in outcome as the focal species of bald eagle (see level of concern table in bald eagle section) which ranged from low on the Malheur to moderate on the Wallowa-Whitman and did not change by alternative.

The main factors that may affect bufflehead habitat will be any potential change in the amount of potential nesting habitat in riparian areas and any change in habitat effectiveness. Buffleheads are cavity obligate nesters, most often nesting in poplar or aspen trees (Gauthier 1993) relatively close to water. As indicated in the bald eagle analysis, all alternatives establish desired conditions for riparian vegetation as well as Riparian Management Areas that have several standard and guidelines that should alleviate most of the risks posed buffleheads. None of the alternatives anticipate alteration of stand structure and composition in riparian areas except as necessary to maintain, restore or enhance conditions that are needed to support aquatic and riparian dependent resources. Additionally, plan components exist to protect large trees, snags and old forest. In addition to desired conditions there are also Standards and Guidelines likely to benefit buffleheads under most alternatives. For example the desired conditions established for snag management is to have them occur in abundance and distribution similar to historic condition and as well there are standard and guidelines to further protect this habitat attribute. Finally as presented earlier, on the landscape scale, snag density appears similar to what would have been expected historically.

Habitat effectiveness should also improve or be maintained under all alternatives as all alternatives envision little new road construction in RMAs (Alt B, C, D, E and F; KW-1SG) or RHCAs (Alt A; RF-1). In general, alternative C proposes the most reduction in road density, if this occurs in riparian areas near to potential source habitat, this should benefit this species. Alternatives B, C, D, E, and F also have a standard to protect (within 1200 feet) known nesting and/or roosting sites of sensitive species (WLD-HAB-6 S-1). When the effects of any of these alternatives are combined with the residual and expected effects of past, present, and future activities in the analysis area, there would likely be no effect or an incremental improvement in habitat for bufflehead ducks resulting from plan components in all alternatives that may lead to increased snag retention and decreased human disturbance in some riparian areas.

Both the breeding and non-breeding populations of buffleheads (NatureServe 2012) are considered secure in the United States (N5B, N5N). In Oregon, only the breeding population is considered imperiled (S2B) which is thought to be more of a factor that Oregon is on the peripheral southern end of its breeding range (Oregon Wildlife Explorer 2013); the non-breeding population is considered secure (S5N)

Malheur National Forest

There are two recorded observations for bufflehead on the Middle Fork of the John Day River in NRM Wildlife but there is no evidence of bufflehead nesting on the forest. Numerous rivers have suitable post breeding habitat that is slow flowing, sheltered, and remains free of ice throughout the winter. Only breeding buffleheads are considered sensitive (less than secure) in the Blue Mountains. Nesting buffleheads have not been documented on the Forest and the best information available indicates that the Forest is not within the breeding range of this species; therefore it is likely that proposed management

activities under any alternative will have **no impact** on individuals, their habitat, or viability of the population or species.

Umatilla National Forest

Although the R6 sensitive species list (Table 1) indicates this species has been documented for the Umatilla National Forest, there are no observations for bufflehead in in NRM Wildlife. Numerous rivers have suitable post breeding habitat that is slow flowing, sheltered, and remains free of ice throughout the winter. Only breeding buffleheads are considered sensitive (less than secure) in the Blue Mountains. Nesting buffleheads have not been documented on the Forest and the best information available indicates that the Forest is not within the breeding range of this species; therefore it is likely that proposed management activities under any alternative will have **no impact** on individuals, their habitat, or viability of the population or species.

Wallowa-Whitman National Forest

There are no observations for bufflehead in NRM Wildlife on the Wallowa-Whitman National Forest. It is suspected to occur according to the R6 sensitive species list (Table 1). Numerous rivers have suitable post breeding habitat that is slow flowing, sheltered, and remains free of ice throughout the winter. Only breeding buffleheads are considered sensitive (less than secure) in the Blue Mountains. Nesting buffleheads have not been documented on the Forest and the best information available indicates that the Forest is not within the breeding range of this species; therefore it is likely that proposed management activities under any alternative will have **no impact** on individuals, their habitat, or viability of the population or species.

Cumulative Effects on species

A game species in Oregon, and although not prized among sport hunters, shooting is a significant factor in their mortality according to Gauthier (1993). The species is vulnerable to hunting because it uses inshore areas extensively in fall and winter. Hunting should, if possible, be managed to prevent extinction of productive local breeding "populations." Because females are strongly philopatric to their natal area and adults of both sexes return to their breeding and wintering areas, re-colonization of areas where local populations are overharvested is slow. Delayed maturity and absence of re-nesting are also negative factors hindering recovery of such populations.

Harlequin Duck

Life History and Habitat Description

This harlequin duck occupies a unique niche among North American waterfowl. Along with the American Dipper (*Cinclus mexicanus*), the harlequin duck uses clear, fast-flowing rivers and streams for breeding and is able to move swiftly and with great agility in turbulent white water, diving to river bottoms to pick larval insects from rocky substrates (Roberston and Goudie 1999). Cassirer et al. (1996) describes breeding streams as reaches on streams with average gradients between 1% and 7%, with some areas of shallow water (riffles); clear water; rocky, gravel to boulder-size substrate; and forested bank vegetation.

During the nesting season (April-June), adult harlequin ducks require fast-flowing water with loafing sites nearby. Harlequins often nest on the ground (Bruner 1997); however, cavities in trees and cliff faces also provide nest sites (Robertson and Goudie 1999). Cassirer and Groves (1994) found that harlequins preferred to nest in areas were mature and old growth forests occurred adjacent to suitable streams. Generally nest is not far (<5 m) from water (Bengtson 1972, Cassierer et al. 1993). Midstream loafing sites are an important part of suitable habitat (Cassirer and Groves 1994). Broods remain near nesting

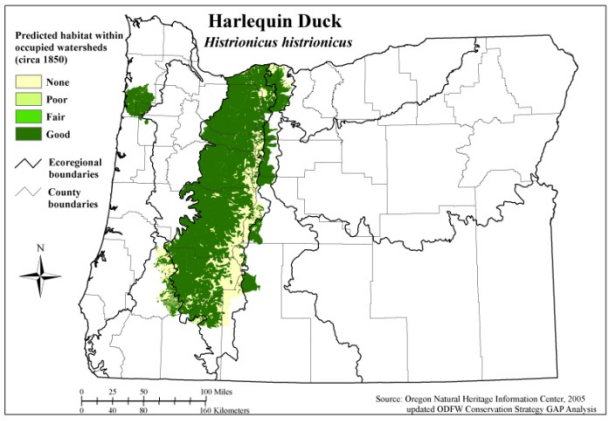
areas for the first few weeks after hatching, then move downstream during the summer (Cassier and Groves 1991). Broods prefer low-gradient streams with adequate macroinvertebrate food sources (Bengtson and Ulfstrand 1971). Aquatic insect larvae make up the bulk of their diet during the breeding season (Cassier and Groves 1994).

In Washington, harlequin ducks breed and use summer habitats in mountain streams on the east and west side of the Cascade Mountains, in the Selkirk Mountains in northeastern Washington, and although the Blue Mountains were originally included within their range (Jewett et al. 1953) that is now in question (Schirato 1994 as cited in Larsen et al. 2004). Based on the maps below, it appears as if it did not occur historically, nor does it occur currently within the Blue Mountains. Robertson and Goudie (1999) agree with this assessment but NatureServe (2012) however does show eastern Oregon within the breeding range of this species.

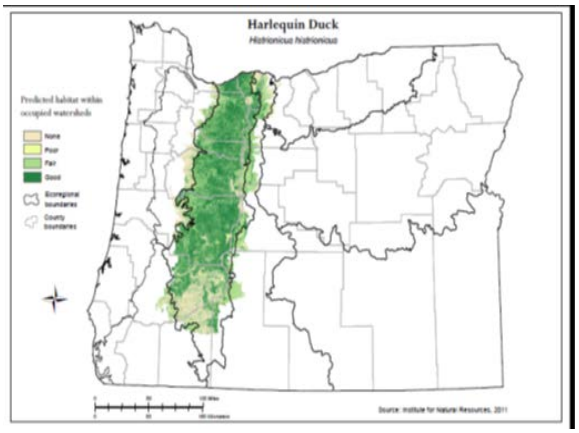
After breeding, individuals migrate to the coasts of North America and Greenland, where they occupy the shallow intertidal zones of rocky coastlines. In Washington, Puget Sound and Juan de Fuca Strait support wintering populations with small numbers seen on exposed coastlines of Washington and Oregon (Larsen et al 2004).

Threats

The primary factors thought to be responsible for declines in the number of harlequin ducks are degradation of breeding streams, human disturbance during the breeding season, and, in some areas, mortality due to hunting during the winter season. Studies have shown that harlequin ducks are sensitive to human disturbances during the breeding season (Robertson and Goudie 1999). Ashley (1994) found that harlequin ducks use stream habitats inaccessible to humans more than expected. Human disturbance such as fishing, hiking along shorelines and boating all seem to be disruptive to harlequin ducks (Wiggins 2005). Harlequins avoided humans on the bank or in the streambed and would typically swim or dive downstream past people, remaining partially submerged and watchful while moving out of the area. Fishing also can directly affect harlequin ducks as birds have been found entangled in fishing line (Ashley 1994, Clarkson 1992). Cassirer and Groves (1990) recommended that trails and roads be located at least 50 meters from streams used by harlequin ducks.



Historic Habitat Map



Current Habitat Map

Determination of Effects

Harlequin ducks are in the Riparian Family and the Group Large Tree or Snag/Open Water. The bald eagle was chosen and the focal species for this group and a focal species assessment was completed. Harlequin ducks use habitats similar to bald eagles, although breeding habitats are more restricted and they also react negatively to human disturbance. . It is expected that the Harlequin duck would have a similar trend in outcome as the focal species of bald eagle (see level of concern table in bald eagle section) which ranged from low on the Malheur to moderate on the Wallowa-Whitman and did not change by alternative.

The main factors that may affect harlequin duck habitat will be any potential change in the amount of potential nesting habitat in riparian areas and any change in habitat effectiveness. As indicated in the bald eagle analysis, all alternatives establish desired conditions for riparian vegetation as well as Riparian Management Areas that have several standard and guidelines that should alleviate most of the risks posed harlequin ducks. None of the alternatives anticipate alteration of stand structure and composition in riparian areas except as necessary to maintain, restore or enhance conditions that are needed to support aquatic and riparian dependent resources. Additionally, plan components exist to protect large trees and old forest. In addition to desired conditions there are also Standards and Guidelines likely to benefit harlequin ducks under most alternatives.

Habitat effectiveness should also improve or be maintained under all alternatives as all alternatives envision little new road construction in RMAs (Alt B, C, D, E and F; KW-1S-15) or RHCAs (Alt A; RF-1) All alternatives actually envision a reduction of roads open to the public compared to existing conditions, except alternative D which maintains the existing condition. In general, alternative C proposes the most reduction in road density, if this occurs in riparian areas near to potential source habitat, this should benefit this species. Alternatives B, C, D, E, and F also have a standard to protect (within 1200 feet) known nesting and/or roosting sites of sensitive species. When the effects of any of these alternatives are combined with the residual and expected effects of past, present, and future activities in the analysis area, there would likely be no effect or an incremental improvement in habitat for harlequin ducks resulting from plan components in all alternatives that lead to decreased human disturbance in some riparian areas and improved riparian conditions.

Both the breeding and non-breeding populations of harlequin ducks in the west (NatureServe 2012) are considered apparently secure in the United States (N4B, N4N). In Oregon and Washington the breeding population is considered imperiled (S2B) and the non-breeding population is considered vulnerable (S3N).

Malheur National Forest

Species is not known to occur on the Malheur National Forest

Umatilla National Forest

Species is not known to occur on the Umatilla National Forest.

Wallowa-Whitman National Forest

Although the R6 sensitive species list (Table 1) indicates this species has been documented for the Wallowa-Whitman National Forest, there are no observations for harlequin ducks in NRM Wildlife. Some historical observations (1930s to 1960s) were reported for some lakes in Wallowa Mountains and one known sighting along the Grande Ronde River in the 1990s, not on NFS lands. It is unknown if these observations were breeding or non-breeding individuals, but the best information available would indicate that neither breeding or wintering individuals occur within the Blue Mountains and therefore it is likely

that proposed management activities under any alternative will have **no impact** on individuals, their habitat, or viability of the population or species.

Cumulative Effects on species

Tameness of species and near-shore wintering habitat make this species easy to hunt. The eastern North American population is listed as Endangered in Canada (Goudie 1991) and is not hunted in the Atlantic flyway. The population in western North America is still legally hunted although hunting pressure is thought to be low. Hunting-bag restrictions exist in Washington and Alaska. Harvest rates are too low to obtain reliable estimates of hunter take from hunter surveys and questionnaires

Riparian Family/Pond-Small Lake-Backwater Group

Columbia Spotted Frog

Life History and Habitat Description

Columbia spotted frogs range from southeastern Alaska to central Nevada, east to Saskatchewan, Montana, western Wyoming, and north central Utah. Columbia spotted frogs were formerly classified as part of *Rana pretiosa*, or Spotted frogs but currently two separate species are recognized; the Oregon spotted frog (*Rana pretiosa*) and the Columbia spotted frog (*Rana luteiventris*). Researchers found that while the two species are nearly identical morphologically, they differ genetically and occupy different ranges (Green *et al.* 1997). Green *et al.* 1997, also indicates there is genetic evidence *R. luteiventris* may be one species with three subspecies or several weakly-differentiated species (Green *et al.* 1997). Additionally, Funk *et al.* 2008 found three highly divergent *R. luteiventris* clades that may actually represent different species. Currently, only the Great Basin populations of Columbia spotted frogs that occur in Oregon (Malheur, Lake, Harney and possibly Grant Counties) are considered a candidate species by the US Fish and Wildlife Service (USFWS 2012). This DPS is also found in Idaho, and Nevada. The Columbia spotted frog is an R6 sensitive species and has been documented on National Forests within the planning area. However as indicated in the map below, the Great Basin DPS does not occur on any of the National Forests under consideration here.

Columbia spotted frogs are highly dependent on aquatic habitats and require permanent and semi-permanent wetlands that have aquatic vegetation and some deeper or flowing water for overwintering (Bull and Marx 2002, Pilliod et al., 2002). The spotted frog frequents waters and associated vegetated (grassy) shorelines of ponds, springs, marshes, and slow-flowing streams and appears to prefer waters with a bottom layer of dead and decaying vegetation (Bull 2005). They occur along the grass and sedge margins of streams, lakes, ponds, springs, and marshes. They typically occur between 1,700 and 8,000 feet in elevation (Corkran and Thoms 2006). The Columbia spotted frog exhibits strong fidelity to breeding sites and often deposits eggs in the same locations in successive years (Reaser 2000, Engle 2001, Pilliod et al. 2002). They deposit egg masses in still, shallow waters atop submergent herbaceous vegetation or among clumps of herbaceous wetland plants. Breeding habitat for Columbia spotted frogs has been characterized, in general, as small silt or muck bottom ponds with emergent vegetation (Morris and Turner 1969, Pilliod et al. 2002, Welch and MacMahon 2005, Pearl et al. 2007). Breeding habitats include a variety of relatively exposed, shallow-water (less than 60 centimeters), emergent wetlands such as sedge fens, riverine over-bank pools, beaver ponds, and the wetland fringes of ponds and small lakes. Vegetation in the breeding pools generally is dominated by herbaceous species such as grasses, sedges and rushes. After breeding, adults often disperse into adjacent wetland, riverine and lacustrine habitats. Tadpoles live in the warmest parts of ponds (Corkran and Thoms 2006). Froglets and adults live in well-vegetated ponds, marshes or slow, weedy streams that meander through meadows (Corkran and Thoms 2006). Wintering habitat was described as large (~2 ha), deep (>3 m) ponds and lakes (Bull and Hayes 2002, Pilliod et al. 2002). Springs may be used as over-wintering sites for local populations of spotted

frogs (Bull and Hayes 2002). Columbia spotted frogs are year-round residents of the planning area and occur in a number of locations across Northeast Oregon (Bull 2005; Reaser and Pilliod 2005).

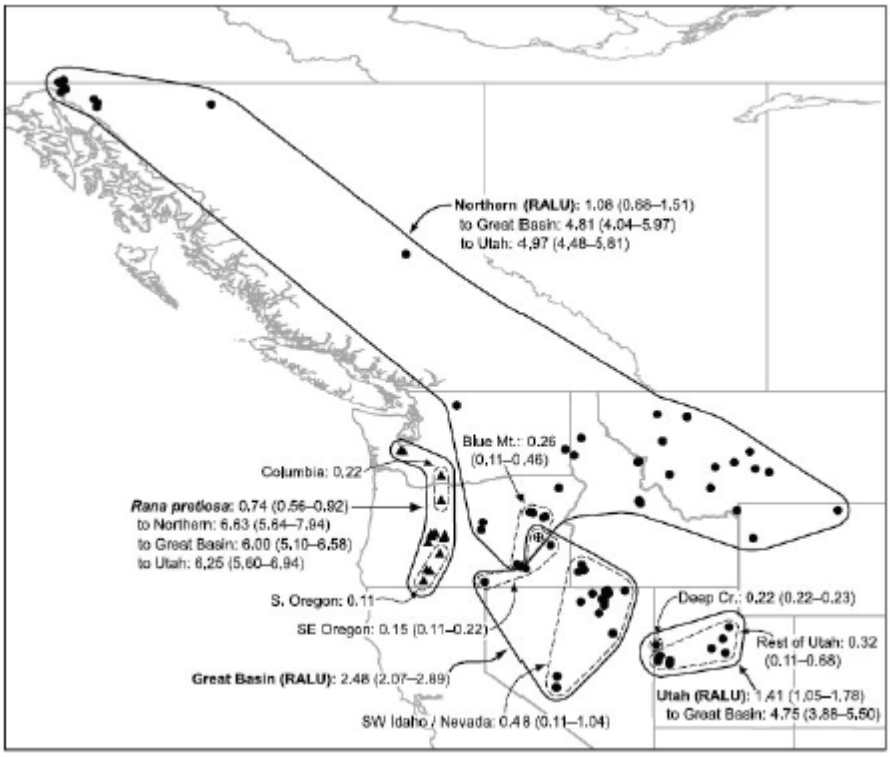


FIGURE 1: MAP TAKEN FROM USFWS CANDIDATE FORM SHOWING CLADES OF SPOTTED FROGS

Threats

A variety of threats to the persistence of populations of Columbia spotted frogs have been identified, including wetland loss, introduced predators, mining, grazing, development, and diseases (USFWS 1997, Monello and Wright 1999, Reaser and Pilliod 2005, Pearl et al. 2007, Tait 2007).

The introduction of non-native predators such as bullfrogs (Marshall et al. 1996), bass and predatory freshwater fish species are believed to contribute to their decline (Pilliod and Petersen 2001, Tait 2007, Murphy et al. 2010). Introduced fish have been linked to decline of ranid frog species in general across western North America (Hayes and Jennings 1986) and specifically to declines of Columbia spotted frogs (Monello and Wright 1999, Reaser 2000). The negative effects of fish introduced into previously fishless ponds and lakes were considerable for amphibians that required permanent water bodies for reproduction and overwintering (Knapp et al. 2001, Knapp et al. 2005). These negative effects also extended to stream habitats with introduced salmonids (Bosch et al. 2006). Previously fishless lakes with introduced trout (*Oncorhynchus* spp.) populations had lower abundance and recruitment of spotted frogs than fishless lakes (Pilliod and Peterson 2001, McGarvie Hirner and Cox 2007). However, Bull and Marx (2002) did not find a strong relationship between the presence of introduced trout and the abundance of eggs and larvae of Columbia spotted frogs. More recently, Pilliod et al. (2010) found no relationship between fish presence and occupancy at any scale by Columbia spotted frogs.

Livestock have been observed to cause direct injury or mortality by trampling spotted frogs and eggs and to impact spotted frog movement by defoliating and dewatering migration corridors and collapsing banks along ponds or rivers used for overwintering sites (Engle 2001, Bull 2005). In Nevada, Reaser (2000) suggested that livestock grazing was important in limiting distribution and density of spotted frogs, but

her inferences were correlative and not a controlled study (Tait 2007). Other studies have suggested similar impacts (Engle 2001, Howard and Munger 2003) but again none have been controlled studies of grazing impacts. Though direct correlation between Columbia spotted frog declines and livestock grazing is lacking, the effects of heavy grazing on riparian areas is well documented (USFWS 2012). Bull and Hayes (2000) and Adams et al. (2009) reported that they did not find any differences in productivity of spotted frogs at grazed vs. ungrazed sites in northeast Oregon. However, there was an indication that grazed sites in this area had reduced food abundance (Whitaker et al. 1983, Bull 2003). In some situations, some amount of grazing may be beneficial to spotted frog habitat. By reducing the density of bank vegetation, grazing could allow increased solar input, raising water temperatures that would benefit egg and larval development and providing basking sites for adults (Bull 2005). The magnitude and nature of the influence of livestock grazing on the Columbia spotted frog has not yet been determined (Tait 2007).

Increasing densities of roads was expected to result in reductions of habitat quality for Columbia spotted frogs as a result of direct mortality, habitat fragmentation, and reduced water quality (Findlay and Houlahan 1997, Findlay and Bourdages 2000, Funk et al. 2005, Houlahan and Findlay 2003, Trombulak and Frissell 2000, Vos and Chardon 1998). Habitat fragmentation and associated reduction in connectivity of habitat has been associated with the disappearance of frog populations from occupied habitat (Knapp et al. 2003, Cushman 2006). Columbia spotted frogs have been reported to move from 500 m (Turner 1960, Hollenbeck 1974, Bull and Hayes 2001) to 1 km (Pilliod et al. 2002) between ponds.

The most important factors in determining an amphibian's vulnerability to road mortality are (1) the speed that the animal travels, (2) its diurnal movement patterns, and (3) the diurnal traffic patterns (Hels and Buchwald 2001). One study in Maine showed that movements of dispersing wood frogs (*R. sylvatica*) were unaffected by a wide forest road (deMaynadier and Hunter 2000).

Determination of Effects

A focal species assessment model was developed and analyzed for Columbia spotted frogs across the 3 planning areas (Wales et al. 2011) The risk and habitat quality factors included in the models were presence of invasive animals (e.g. trout), pond size, livestock grazing and road density. The National Wetlands Inventory data and local Forest vegetation data were used to identify potential source habitat for this species. The viability outcomes for historical were primarily an A outcome. On the Umatilla and Malheur National Forest, the current outcomes are primarily a C outcome and primarily B/A outcome on the Wallowa-Whitman National Forest. This translates into a current "level of concern" of moderate on the Umatilla and Malheur and low on the Wallow-Whitman.

Table CSPF-1: Level of viability concern by national forest for the Columbia spotted frog currently and projected for each alternative.

National Forest	Current	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
Umatilla	M	M	M	M/L	M	M	M
Malheur	M	M	M	M/L	M	M	M
Wallowa-Whitman	L	L	L	L	L	L	L

The desired condition under all alternatives is to maintain or increase the extent and diversity of wetlands within the Blue Mountains (1.1.3 Wetland function). Executive Order 11190 (Carter 1977) also limits the loss or conversion of this type of habitat. Additionally, all alternatives have desired conditions to restore and improve hydrologic and riparian function within watersheds (*1.1.1 Hydrologic Function, 1.1.2 Riparian Function, 1.1.3 Wetland Function, 1.1.4 Stream Channel Function, and 1.1.5 Aquatic Habitat Function).* Part of this is accomplished through establishment of Key watersheds and RMAs (MA 4B) that have several standard and guidelines that should alleviate some of the risks posed Columbia spotted frogs.

All alternatives envision little new road construction in RMAs/RHCAs (Alt B-F: Standard KW-1S-15, Guideline RF-1; Alt A Standard RF-1). All alternatives actually envision a reduction of roads open to the public compared to existing conditions, except alternative D which maintains the existing condition.

It is assumed that livestock grazing would be managed in a manner to achieve the expressed desired conditions of the plan. Based on both utilization and stocking levels, Alternative C, followed by E and F would be the least detrimental to riparian habitats based utilization levels given in standard and guideline MA 4B RMA-RNG-2 G-115 for riparian management areas (MA 4B). Alternative D would be the least favorable towards riparian species in that more acres are being proposed for domestic livestock grazing and the riparian management area is the narrowest of all of the alternatives. In all cases, guideline MA 4B RMA-1 G-101 (shown in table below) applies to all alternatives, which states that projects will not result in long-term degradation of riparian and aquatic habitats. Monitoring data conducted as part of the PACFISH/INFISH Biological Opinion (PIBO) effort (Archer et al. 2009) have indicated on a broad scale that there has been a recovery in several areas for many of the parameters most closely associated with livestock grazing effects. Analysis of PIBO data for the three national forests also indicates a favorable trend in many of the parameters important to this species.

Based on the desired conditions of all alternatives, it is unlikely there will be a reduction in the amount of source habitat or quality of this habitat due to the implementation of any of the alternatives. In all likelihood the viability of this species may improve under all alternatives due to the attention placed on improving riparian area and function where much of this species habitat is located.

MA 4B RMA-1 G-101	**Guideline** When RMAs are functioning properly, project activities should be designed to maintain those conditions. When RMAs are not properly functioning, project activities should be designed to improve those conditions. Project activities in RMAs should not result in long-term degradation to aquatic and riparian conditions at the watershed scale. Limited short term or site-scale effects from activities in RMAs may be acceptable when they support, or do not diminish, long-term benefits to aquatic and riparian resources.
Roads	
KW-1 S-15	**Standard** There shall be no net increase in the mileage of Forest Roads in any key watershed unless the increase results in a reduction in road-related risk to watershed condition. Priority should be given to roads that pose the greatest relative ecological risks to riparian and aquatic ecosystems.
WLD-HAB-28 G-14	**Guideline** Roads and trails should not be constructed within high elevation riparian areas.
MA 4B RMA-RD-4 G-120	**Guideline** Wetlands and unstable areas should be avoided when reconstructing existing roads or constructing new roads and landings. Minimize impacts where avoidance is not practical.
MA 4B RMA-MIN-2 G-129	**Guideline** Structures, support facilities, and roads should be located outside RMAs. Where no alternative to siting facilities in RMAs exists, locate them in a way to minimize adverse effects to aquatic and other riparian dependent resources. Existing roads should be maintained to minimize damage to aquatic and riparian dependent resources.

Invasive species and disease are for the most part outside the control of plan components and the current analysis does not analyze the threat of the fungus chytridiomycosis (see Wales et al. 2011). It is unknown how the effect of most management activities may influence this fungus.

The population of Columbia spotted frog in the Blue Mountains (NatureServe 2012) is considered apparently secure in the United States (N4). In Oregon they are considered imperiled/vulnerable (S2/S3) and in Washington they are considered apparently secure (S4), making them sensitive only in Oregon.

Malheur National Forest

Spotted frogs have been found in several locations in suitable habitat on the Malheur National Forest.

Given the analysis above, results of the focal species assessment model, and the wide complement of standards and guidelines that deal specifically with riparian/aquatic habitats, it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. The focal species assessment model for this species indicated no change in the concern for viability within the plan area.
2. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
3. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Umatilla National Forest

Spotted frogs have been found in several locations in suitable habitat on the Umatilla National Forest.

Given the analysis above, results of the focal species assessment model, and the wide complement of standards and guidelines that deal specifically with riparian/aquatic habitats, it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. The focal species assessment model for this species indicated no change in the concern for viability within the plan area.
2. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
3. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Wallowa-Whitman National Forest

Spotted frogs have been found in several locations in suitable habitat on the Wallowa-Whitman National Forest.

Given the analysis above, results of the focal species assessment model, and the wide complement of standards and guidelines that deal specifically with riparian/aquatic habitats, it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. The focal species assessment model for this species indicated no change in the concern for viability within the plan area.

2. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.

3. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

Columbia spotted frog habitat degradation is a combined result of past and current land used influences from agricultural development, intensive livestock grazing, spring development, urbanization, mining activities, nonnative species and climate change (USFWS 2012). Much of the historic habitat for this species occurred on private lands and there is little indication that the level of the threats mentioned above would decrease by any appreciable level. Many of the nonnative species (e.g., bull frog, rainbow trout, bass) were introduced in the early 1900's. Because of the early recreational fishery, nonnative trout were introduced into most watersheds by ODFW. Currently because of native fish concerns, many streams are no longer stocked with nonnative species but many of the lakes are still stocked for recreational fisheries (Chilton 2013). There are no known plans to reduce the abundance of non-native trout in areas they exist.

Painted Turtle

Life History and Habitat Description

Western painted turtles are the most widespread turtle species in North America, occurring across a broad swath of the North American continent. The western painted turtle, *C. picta bellii*, ranges west across southern Canada from Ontario to British Columbia and south from Missouri to Idaho (Ernst and Lovich 2009). A small band of its range juts into northern Oregon (see figure 2 taken from Gervais et al. 2009), restricted to the northern Willamette Valley south to Salem and east into central- and northeastern Oregon, primarily within the Columbia Basin (St. John 2002 cited in Vesley and Rosenberg 2010). Other reported locations within Oregon may be released pet turtles or their progeny (Gervais et al. 2009). Based on records in the ORNHIC database, painted turtles rarely occur above 1000 m elevation in Oregon and are largely absent from faster-moving lower-order streams, preferring bottomlands.

Aquatic and terrestrial habitats are required for western painted turtles. Their aquatic habitat is typically slow-moving and shallow water, including marshes, canals, sloughs, small lakes, ponds or low gradient, slow moving streams with a muddy or sandy substrate and aquatic vegetation (Gervais et al. 2009, Marshall et al. 1996). Streams that have moderate to high gradient with a rocky, cobble and gravel-dominated substrate are probably unsuitable for the painted turtle.

They appear to select water bodies with surface or emergent vegetation and a muddy substrate. Terrestrial habitat is used primarily for nesting, but occasionally for over-wintering and overland movements among aquatic habitats. Nest habitat is composed of sparsely vegetated areas with southern exposure, relatively close to aquatic habitat (Baldwin et al 2004, Mahmoud 1968, Ross 1989). Although there is a bias towards researchers finding nests near aquatic habitat due to nest-searching strategies, radio telemetry confirms this general pattern throughout the species' range (Ernst and Lovich 2009). A broad array of substrates is used for nesting, including selecting areas in Oregon with recent fill composed primarily of gravel and sand in areas where most of the available area was primarily native soils (Gervais et al. 2009). Over-wintering is often in shallow aquatic environments but also occurs in terrestrial habitats (Bowne 2007). Little is known of habitat use by hatchlings, but evidence suggests they tend to use shallower aquatic habitats. In Oregon, western painted and western pond turtles use similar habitat with the primary difference being the painted turtle's greater dependence on aquatic habitat for over-wintering and selection of slower, more stagnant aquatic habitats (Gervais et al 2009).

Threats

The primary threats to the western painted turtle in Oregon are related to the fact that a major part of its range in Oregon occurs within the urban environment (Gervais et al. 2009). For example, limited nest site availability is of particular concern in urban and urbanizing environments.

Factors most often cited as limiting western painted turtle populations include loss of wetland and upland habitat, and elevated nest and hatchling predation (Gervais et al. 2009). Additionally road mortality and limited connectivity between nesting, over-wintering, aquatic, and dispersal habitat, competition from introduced turtle species, hatchling predation by introduced bass (both smallmouth and largemouth) and the American bullfrog, human disturbance from increased recreational use of aquatic systems, and indirect effects of pesticide use may also be limiting this painted turtles (Gervais et al. 2009).

Steen and Gibbs (2004) found that turtle populations were male dominated in high road density areas (73% for painted turtles and 95% for snapping turtles) but were less so in low road density areas (54% for painted turtles and 74% for snapping turtles). This suggests that females are being killed by vehicles at higher rates than males, most likely during nesting migrations. This may be a significant threat to turtle populations near roads because these populations will be skewed towards males and will have lower recruitment. Because of the long lifespan of turtles, it may take decades before it becomes apparent that a population is in decline.

Research has shown that juvenile Painted Turtles, when taken by Largemouth Bass (*Micropterus salmoides*), will thrash and claw, often eliciting their release by the predator (Britson and Gutzke 1993). This behavior is not exhibited by all turtle species but appears to give survival advantages to the Painted Turtle where predatory fish large enough to engulf juveniles, like Largemouth Bass, are present.

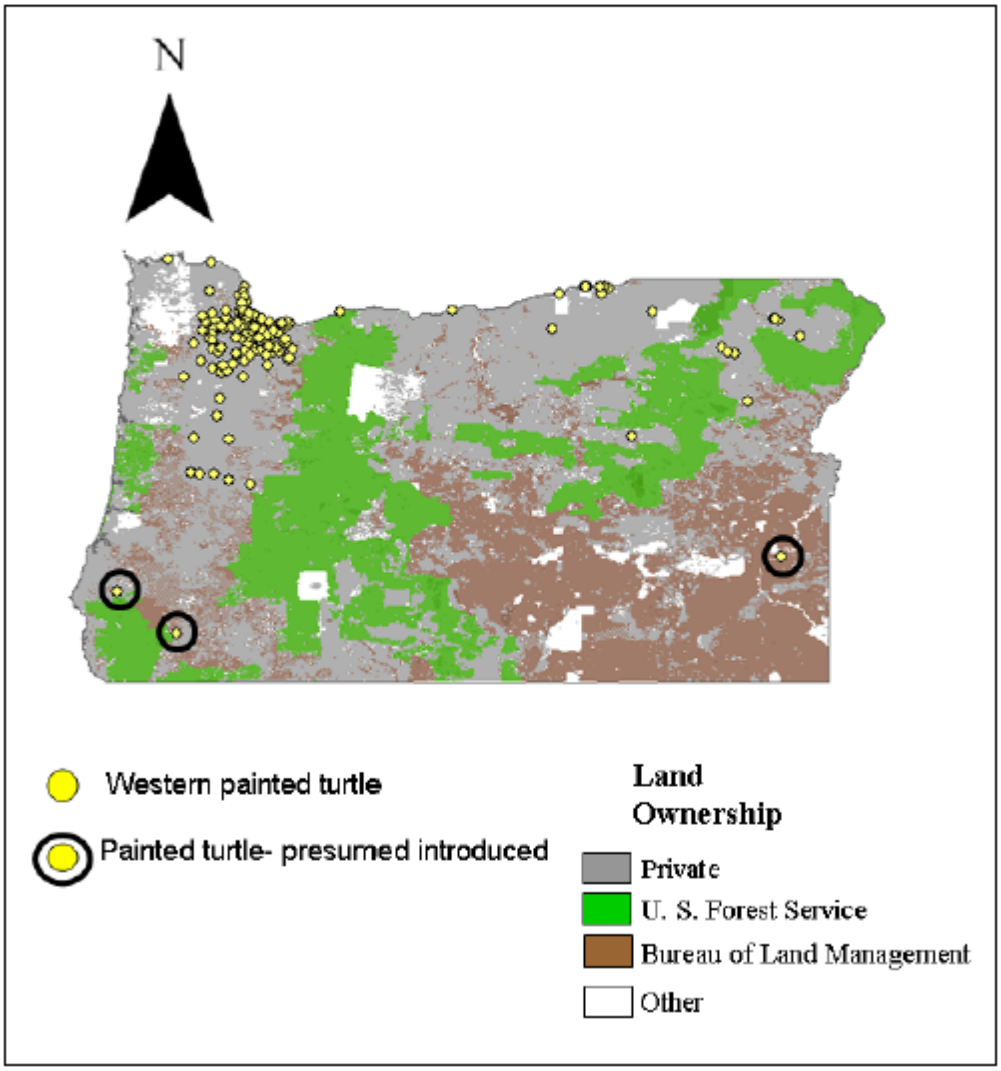
Determination of Effects

The Painted Turtle is in the Family Riparian and Group Pond/Small lake/Backwater. This species is best represented by the focal species of Columbia Spotted frog. The frog has a much wider distribution across all three planning areas. The viability outcome for spotted frogs showed slight declines in viability due to loss of habitat, invasive species, livestock grazing and road densities in close proximity to source habitat, all which are also threats to this species. The decline however was not sufficient to change the level of concern for the spotted frogs viability (see table CSPF-1), which, in all likelihood, would be the case for the painted turtle.

As discussed for the Columbia spotted frog all alternatives establish RMAs that have several standards and guidelines that should alleviate some of the risks posed painted turtles. The desired condition under all alternatives is to maintain or increase the extent and diversity of wetlands within the Blue Mountains (1.1.3 Wetland function). Additionally, Executive Order 11190 (Carter 1977) also limits the loss or conversion of this type of habitat. All alternatives envision little new road construction in RMAs/RHCAs (Alt B-F: Standard KW-1S-15; Alt A Standard RF-1). All alternatives actually envision a reduction of roads open to the public compared to existing conditions, except alternative D which maintains the existing condition. It is also assumed that livestock grazing would be managed in a manner to achieve the expressed desired conditions of the plan and all alternatives include a standard to protect (within 1,200 feet) known nesting sites of sensitive species.

Based on the desired conditions of all alternatives, it is unlikely there will be a reduction in the amount of source habitat or quality of this habitat due to the implementation of any of the alternatives. In all likelihood the viability of this species may improve under all alternatives due to the attention placed on improving riparian area and function where much of this species habitat is located.

Figure 2. Distribution of painted turtle observations among public and private lands in Oregon. Location records were obtained from ORNHIC, U.S.D.A. Forest Service, U.S.D.I. Bureau of Land Management, ODFW Citizen Science efforts, Port of Portland, Metro, and other respondents to our request for location data. Few surveys have been conducted in eastern Oregon, contributing to the lower number of location records in the databases. Some of the records in addition to those indicated may also have been from introduced non-native stock of painted turtles.



There is a potential for direct impacts to individual painted turtles as a result human disturbance and/or livestock grazing. This potential impact is extremely unlikely as the species has not been documented as occurring on national forest lands within the Blue Mountains. It is also uncertain if the Blue Mountains are within the historic range of this species (Stebbins 2003, Gervais et al. 2009), or if the existing records are a result of released pet turtles.

The western painted turtle is listed as an ISSSSP Sensitive Species in Oregon and is an Oregon Conservation Strategy Species (ODFW 2006) and as a Sensitive-Critical species (ODFW 2008). It has no

special status in the state of Washington. The species is listed as a U.S. Fish and Wildlife Service Species of Concern. The Natural Heritage (NatureServe 2012) Global Rank is G5 (demonstrably widespread), and the Oregon State Rank is S2 (imperiled).

Malheur National Forest

Suitable habitat is not known to occur and this species has not been observed in or believed to be present on the Malheur National Forest.

Umatilla National Forest

Table 1 indicates that this species is suspected to occur on the Umatilla National Forest however painted turtles have not been observed on the Forest. Based on the above analysis it would also appear questionable that habitat or individuals occur on the Umatilla. Even so, in the unlikely event of occurrence, the management activities proposed under any alternative **may impact** individuals or habitat, but is not likely to contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. The focal species assessment model for this group indicated no change in the concern for viability within the plan area.
2. Not commonly found at elevations above 1,000 meters.
3. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
4. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Wallowa-Whitman National Forest

Suitable habitat is not known to occur and this species has not been observed in or believed to be present on the Wallowa-Whitman National Forest.

Cumulative Effects on species

Much of the habitat degradation for the painted turtle is a result of past and current land use influences from agricultural development, intensive livestock grazing, urbanization, nonnative species and climate change (Gervais et al. 2009). Much of the historic habitat for this species occurred on private lands and there is little indication that the level of the threats mentioned above would decrease by any appreciable level. Many of the nonnative species (e.g., bull frog, rainbow trout, bass) were introduced in the early 1900's. Because of the early recreational fishery, nonnative trout were introduced into most watersheds by ODFW. Currently because of native fish concerns, many streams are no longer stocked with nonnative species but many of the lakes are still stocked for recreational fisheries (Chilton 2013). There are no known plans to reduce the abundance of non-native species in areas where they exist, although ODFW allows unlimited take of bullfrogs as well as encourages people to remove and dispose of them wherever they are found.

Riparian Family/Shrubby Deciduous Riparian Group

Mountain Quail

Life History and Habitat Description

Mountain quail have occurred in the Blue Mountains of northeastern Oregon and southeastern Washington since the 1800's (Crawford 2000), but little evidence suggests that they were native to Washington (USFWS 2003a). Mountain quail were introduced into Washington, but there are scattered populations along the Columbia and Snake rivers that may be extensions of Oregon flocks (Larsen et al. 2004). The northern and eastern extent of their historic distributions in the Pacific Northwest is unclear. Crawford (2000) concluded that the eastern extent of their native range was the Cascade Mountain Range, and the northern extent was the southern edges of the Columbia River (figure 1). He further surmised that geographic ranges north of the Columbia River and east of the Cascades are likely the result of multiple translocations of Mountain Quail that began in 1860. Mountain Quail were translocated to British Columbia, Alabama, New Zealand, and many parts of Idaho, Washington, and Nevada (Crawford 2000; Jobanek 1997).

Birds from multiple sources were translocated into Washington, resulting in mixing of various subspecies. Populations in eastern Washington have declined in recent years (Larsen et al 1994). In 2005 and 2006, wild-trapped mountain quail from southwestern Oregon were released in southeastern Washington (WDFW 2008). According to Paul Wik (biologist with WDFW) additional translocations have been attempted in recent years with little success, but it is likely that a few birds may occur in the planning area. Pope and Crawford (2004) in working with native and wild translocated birds concluded that with their ability to rapidly expand their populations and exploit marginal habitats, mountain quail are excellent candidates for reintroduction programs.

Mountain Quail occupy diverse habitats including hardwood, hardwood-coniferous, and coniferous-chaparral vegetation communities with a shrub understory in the western part of their range (Johnsgard 1973, Vogel and Reese 1995) and shrub communities often associated with riparian areas that may or may not have an open coniferous forest overstory in their eastern ranges (Ormiston 1966, Brennan 1994, Vogel and Reese 1995). Across their range, Mountain Quail are generally found in shrub-dominated communities and early-successional mixed conifer-shrub vegetation usually found after disturbances such as fire and logging (Johnsgard 1973, Guitierrez and Delehanty 1999, Pope 2002). Pope and Crawford (2004) found that mountain quail are generally abundant with populations distributed homogeneously in the coniferous forests of the Coast and Cascade Mountain Ranges of southwestern Oregon, but in the semiarid regions of eastern Oregon they are sparsely distributed and mostly confined to narrow, disjunct riparian zones.

In arid regions, such as in southeastern Washington, typical habitat consists of deciduous shrub thickets below talus and cliffs, and alder (*Alnus* spp.) thickets along streams (Brennan et al. 1987). In such arid settings, free-flowing water is essential (Ormiston 1966, Leopold 1972, Gutierrez 1975) and mountain quail are often found in close proximity to both water and escape cover (Brennan et al. 1987).

In eastern Washington, mountain quail persist in relatively isolated populations interconnected by corridors of riparian brush communities. These corridors serve as avenues for dispersal and movement between breeding and wintering habitat, as well as provide food and cover in close proximity to water sources (Brennan 1993).

Grazing may reduce the distribution, density, composition, and structure of many vegetation communities, and depending on intensity have either a negative or a positive impact on Mountain Quail nest areas (Pope 2002). Excessive grazing may reduce cover critical for the production of successful

nests. Conversely, moderate grazing may benefit Mountain Quail by reducing dense, overstory shrubs that inhibit the growth of sufficient ground cover for nests.

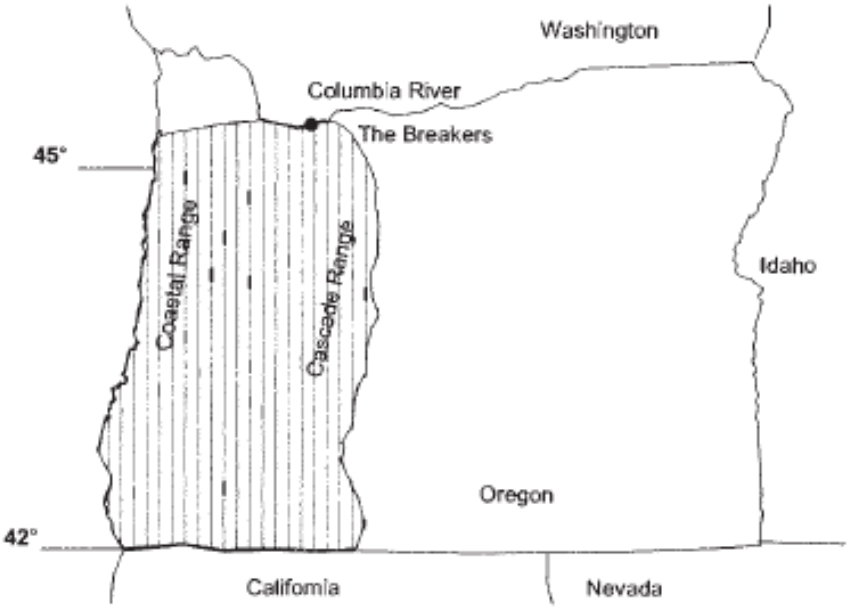


Fig. 1. Early historical distribution of mountain quail in the Pacific Northwest (from Lewis and Clark in Strong and Strong 1995, Douglas 1829, Audubon 1844), showed by hatched area.

Threats

Mountain Quail populations have declined in the eastern portion of their range during the last century, likely as a result of habitat loss resulting from overgrazing and fire suppression (Gutierrez and Delehanty 1999). Regional extinctions of mountain quail in Idaho and Nevada are apparently related to two factors: (1) intensive agriculture and associated hydro-power reservoir impoundments along the Snake River corridor and 2) disruption of key habitat resources along secondary riparian corridors by excessive cattle grazing (Brennan 1994).

An inadequate food supply caused by habitat loss throughout mountain quail range is considered a major limiting factor (Larsen et al. 1994). The loss of winter habitat from dams and water impoundments, residential development, intensive agriculture, and the deterioration of wintering and breeding grounds as a result of overgrazing, fire, and weed invasion also limits mountain quail (Gutierrez and Delehanty 1999, Larsen et al. 1994). Timber harvest does not appear to limit mountain quail if the cut site is allowed natural regrowth and invasion by brush species however excessive timber harvest [>200-400 ha (500-1,000 ac)] may negatively impact mountain quail but this has not been proven (Larsen et al. 1994).

Water has been reported as a limiting factor (Ormiston 1966, Gutiérrez 1975) and maybe a problem in southeastern Washington (Larsen et al. 1994). An increased water supply due to greater rainfall has resulted in higher breeding success in arid regions (Gutiérrez 1975, 1980; Brennan et al. 1987). The loss of riparian habitat in arid portions of mountain quail range is a serious threat to their stability (Larsen et al. 1994).

Past activities, actions, and events that affect mountain quail and its habitat include and fire suppression. Fire suppression has allowed for the encroachment of fire-intolerant conifer species into historically shrubby riparian areas. The composition and structure of these stands has changed, reducing the quality of these stands for mountain quail. Ongoing (present) and reasonably foreseeable future activities in the analysis area that affect this warbler or its habitat include fire suppression.

Determination of Effects

The Mountain Quail is in the Family Riparian and Group Shrubby/Deciduous Riparian. This species is best represented by the focal species of MacGillivray's warbler. The warbler has a much wider distribution across all three planning areas though has similar habitat quality/risk factors. The viability outcome for MacGillivray's warbler showed declines in viability due to loss of habitat, livestock grazing and invasive species (cowbirds). Cowbirds are not known to be a risk to mountain quail. Historically across the Umatilla National Forest the viability was projected to be an A outcome for MacGillivray's warbler and currently the viability is primarily a C outcome (Wales et al. 2011). The analysis completed for the DEIS indicated that none of the alternatives caused an appreciable change in the viability outcome for the MacGillivray's warbler (see table below) and it is assumed that the mountain quail's viability trend would be similar.

Table MGWA-1: Level of viability concern by national forest for the MacGillivray's Warbler currently and projected for each alternative.

National Forest	Current	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
Umatilla	M	M	M	M/L	M	M	M
Malheur	M	M	M	M/L	M	M	M
Wallowa-Whitman	M	M	M	M/L	M	M	M

All alternatives have desired conditions to restore and improve hydrologic and riparian function within watersheds (*1.1.1 Hydrologic Function, 1.1.2 Riparian Function, 1.1.3 Wetland Function, 1.1.4 Stream Channel Function, and 1.1.5 Aquatic Habitat Function).* Part of this is accomplished through establishment of Key watersheds and RMAs (MA 4B) that have several standard and guidelines that should alleviate many of the risks for mountain quail.

It is assumed that livestock grazing would be managed in a manner to achieve the expressed desired conditions of the plan. Based on both utilization and stocking levels, Alternative C, followed by E and F would be the least detrimental to riparian habitats based utilization levels given in standard and guideline MA 4B RMA-RNG-2 G-115 for riparian management areas (MA 4B). Alternative D would be the least favorable towards riparian species in that more acres are being proposed for domestic livestock grazing and the riparian management area is the narrowest of all of the alternatives. In all cases, guideline MA 4B RMA-1 G-101 (shown in table below) applies to all alternatives, which states that projects will not result in long-term degradation of riparian and aquatic habitats. Monitoring data conducted as part of the PACFISH/INFISH Biological Opinion (PIBO) effort (Archer et al. 2009) have indicated on a broad scale that there has been a recovery in several areas for many of the parameters most closely associated with livestock grazing effects. Analysis of PIBO data for the three national forests also indicates a favorable trend in many of the parameters important to this species.

All alternatives establish Riparian Management Areas (or Riparian Habitat Conservation Areas for Alt A) that have several standard and guidelines that should alleviate some of the risks posed to mountain quail. Riparian areas, lakes, and wetlands are protected under all management direction. Executive Order 11190 (Carter 1977) also limits the loss or conversion of this type of habitat.

The desired condition under all action alternatives is to maintain or increase the extent and diversity of wetlands within the Blue Mountains (1.1.3 Wetland function).

All alternatives envision little new road construction in RMAs (Alt B, C, D, E, and F) or RHCAs (Alt A) (Alt B-F: Standard KW-1S-15, Alt A Standard RF-1). All alternatives actually envision a reduction of roads open to the public compared to existing conditions, except alternative D which maintains the existing condition.

MA 4B RMA-RNG-2 G-115	**Guideline** Table 52a displays the maximum utilization guidelines for riparian management areas.

Table 52a. Maximum utilization within riparian management areas*

Measure	Alt. B	Alt. C**	Alt. D	Alt. E	Alt. F
Maximum percent utilization of woody vegetation (percent of mean annual vegetative production)	40%	25%	40%	25% within bull trout spawning and rearing reaches 40% for all other watercourses including anadromous fish reaches	25% in bull trout spawning and rearing habitat (all three national forests) 35% in anadromous fish reaches (UMA and WAW) 40% outside bull trout spawning and rearing habitat (MAL) 40% outside anadromous fish reaches (UMA and WAW)
Maximum percent utilization of herbaceous vegetation(percent of mean annual vegetative production)	40%	10%	40%	25% within bull trout spawning and rearing reaches 40% for all other watercourses including anadromous fish reaches	25% in bull trout spawning and rearing habitat (all three national forests) 35% in anadromous fish reaches (UMA and WAW) 40% outside bull trout spawning and rearing habitat (MAL) 40% outside anadromous fish reaches (UMA and WAW)

* In addition, the minimum residual stubble height (applies at the greenline) for all alternatives is 4 to 6 inches. The maximum bank alteration for all alternatives is 20 percent.

** For alternative C, this is a standard for maximum utilization within riparian management areas.

MA 4B RMA-1 G-101	**Guideline** When RMAs are functioning properly, project activities should be designed to maintain those conditions. When RMAs are not properly functioning, project activities should be designed to improve those conditions. Project activities in RMAs should not result in long-term degradation to aquatic and riparian conditions at the watershed scale. Limited short term or site-scale effects from activities in RMAs may be acceptable when they support, or do not diminish, long-term benefits to aquatic and riparian resources.

In general, alternative C should see the greatest improvement and the most rapid recovery of riparian and wetland areas due to the reduced area subjected to domestic livestock grazing and the stricter utilization levels within those areas that are subject to grazing. Additionally, alternative C establishes the most acres within riparian management areas (RMAs) and has the widest buffer zone.

Based on the desired conditions of all alternatives, it is unlikely there will be a reduction in the amount of source habitat or quality of this habitat due to the implementation of any of the alternatives. In all likelihood the viability of this species may improve under all alternatives due to the attention placed on improving riparian area and function where much of this species habitat is located.

Much of the source habitat is located within or in close proximity to both key watersheds and RMAs, based on the desired conditions, objectives and standards and guidelines the risk to MacGillivray's warbler viability is not increasing. Likely due to implementation of any alternative, viability for species within this group will remain the same as current or increase due to the plan components that may lead to decreased amount and/or intensity of grazing in some riparian areas and perhaps some increase in the amount of source habitat.

There is a potential for direct impacts to individual Mountain Quail as a result human disturbance and/or livestock grazing. This potential impact would be limited to a small number of individuals. Impacts to populations are not expected.

Umatilla National Forest

Although mountain quail have been documented on the 2 Ranger Districts in Washington (Pomeroy RD, Walla Walla RD), the U.S. Fish and Wildlife Service did not consider this species to be native to Washington (USFWS 2003). The species is considered secure both globally (G5) and Nationally (N5) but is critically imperiled (S1) in Washington (NatureServe 2012).

Given the analysis above, results of the focal species assessment model, and the wide complement of standards and guidelines that deal specifically with riparian/aquatic habitats, it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. The focal species assessment model for this group indicated no change in the concern for viability within the plan area.
2. The USFWS does not consider species native to Washington, precluding it from listing under the ESA.
3. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
4. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

Although mountain quail are hunted in Washington, hunting is not allowed east of the Cascades making those birds found in the Blue Mountains of Washington protected from hunting. Hunting of this bird in the Blue Mountains of Oregon is allowed in Wallowa and Umatilla Counties which are adjacent to Washington, and though unlikely could have effects on this species in the immediate vicinity of the state boundary.

As previously mentioned, Thirty-four percent of the Blue Mountain ecoregion is private land which is concentrated in the river valley bottoms, which contain the best soils and access to water. Mountain quail habitat has been degraded by overgrazing, herbicides and permanent losses of riparian wetland habitats due to rural residential growth, suburban sprawl, ranchettes, subdivisions, subdivided cropland and floodplain encroachment (WDFW 2005). Although efforts exist to coordinate with local land trusts,

conservation districts and other conservation organizations and agencies to conserve important habitat on both public and private land, significant improvement of riparian habitat on private lands is not expected.

Wetland Family/Marsh Group

Tricolored Blackbird

Life History and Habitat Description

The Tricolored Blackbird forms the largest breeding colonies of any North American landbird (Cook and Toft 2005). As many as 20,000 to 30,000 nests have been recorded in cattail (*Typha* spp.) marshes of 4 ha or less, with individual nests <0.5 m from each other (Neff 1937, DeHaven et al. 1975).The tricolored blackbird is an intensely colonial breeder, forming dense noisy colonies that are easily detected (Spencer 2003). The species is largely endemic to the lowlands of central and southern California where they breed in freshwater marshes with emergent vegetation such as cattails, bulrush, willows and blackberries (Beedy 2008). The species now occurs in relatively lower abundance in southern and coastal California and sporadically in Oregon, northwestern Baja California, and western Nevada (Tricolored Blackbird Working Group 2007).

In Oregon, tricoloreds breed locally in s. Klamath and s. Jackson Cos. and at several isolated locations, including ne. Portland, Multnomah Co.; near Clarno and Wamic, Wasco Co.; John Day Fossil Beds National Monument, Wheeler Co.; and near Stanfield, Umatilla Co., in n.-central Oregon, as well as at Summer Lake, Lake Co., in s. Oregon. Scattered summer reports have occurred elsewhere in Oregon, including Willamette Valley but most of these observations are suspect (Spencer 2003).

Most breeding tricolors forage within 5-6 km of their colony sites, although on rare occasions they have been observed foraging up to 13 km from their colony sites (Beedy and Hamilton 1997). Proximity to suitable foraging habitat appears to be extremely important for the establishment of colony sites (Tricolored Blackbird Working Group 2007). Adults normally forage on grains; however during the breeding season availability of insect prey becomes important (Hamilton 2004). Among the most important prey for adults provisioning nestlings include Coleopterans (beetles), Orthopterans (grasshoppers, locusts), Hemipterans (true bugs), larval Lepidoptera (caterpillars) other larval insects, and Arachnids (spiders and allies) (Crase and DeHaven 1977). Meese (2013) found widespread and chronic reproductive failures except in cases of relatively high insect abundance.

Wintering tricolors often congregate in huge, mixed-species flocks that forage in grasslands, agricultural fields and at dairies and feedlots, roosting in large, heavily vegetated freshwater marshes (Tricolored Blackbird Working Group 2007).

Habitat

The species' basic requirements for breeding sites are open accessible water, a secure substrate in which to place their nests, and suitable nearby foraging areas that provide adequate food sources (Beedy and Hamilton 1999). If any one of these required elements is missing, tricolors will not select that location for breeding and will move to another location that is suitable (Beedy and Hamilton 1999).

As mentioned above nesting habitat historically occurred in the vicinity of fresh water, especially marshy areas (Hamilton 2004). The most favored sites for colonies were freshwater marshes dominated by cattails and tules, but other vegetation such as nettles, willows, and thistles were used. Breeding habitat now includes diverse upland and agricultural areas (DeHaven et al. 1975, Beedy et al. 1991, Tricolor Blackbird Working Group 2007). Oregon breeding colonies occur in hardstem bulrush, cattail, nettles, willows and Himalayan blackberries although cattails are the preferred nest substrate (Neff 1937, Spencer 2003).

One essential would seem to be provision at the site of the colony for a large number of individuals. Nests apparently must be close together and pairs usually in excess of 50 in order to meet the instinctive requirements of the species. Foraging grounds about the colony may be utilized even if several miles distant. Flooded lands, margins of ponds, and grassy fields, in summer and winter, constitute typical foraging terrain.

Threats

According to Beedy and Hamilton (1999) the main threats to tricolored blackbirds are: effects of human activity related to habitat loss and alteration (Tricolored Blackbird Working Group 2007); nests and nest contents in cereal crops and silage destroyed by agricultural operations (DeHaven 2000, Hamilton 2004); pesticides and other contaminants/toxics (Beedy 2008). Patterns of reproductive success in the different nesting substrates suggest that a significant proportion of the breeding population now occurs in population sinks (Pulliam 1988). Overall the current decline of the population is strongly correlated with its persistent use and re-use of attractive habitats where reproduction often fails, combined with continuing losses of productive nesting substrates of all kinds (Cook and Toft 2005). Introduced plants considered noxious weeds and undesirable in the landscape, now the best nesting habitat for Tricolored Blackbirds, are being lost not only to routine agricultural practices and land conversion but also to removal by the well-meaning conservation community. Additionally, changes in agricultural practices (grains to grapes/nuts) has also been suggested as a threat this species (Beedy 2008).

The reproductive success of entire colonies can be reduced severely by both mammalian and avian predators (reviewed by Beedy and Hamilton 1999), but rates of predation are highly variable in space and time and, until recently, predators have not been known to cause sustained reproductive failures of multiple colonies across a wide geographic area (Beedy 2008, Meese 2013).

Determination of Effects

The Tricolored Blackbird is in the Family Riparian and the Marsh Group. This species is best represented by the focal species of Marsh Wren. The marsh wren has a much wider distribution across all three planning areas though has similar habitat quality/risk factors. The viability outcome for marsh wren showed slight declines in viability due primarily to loss of habitat. Invasive plant species may also be contributing to the loss of habitat. Currently the viability outcome on the Umatilla, Wallowa-Whitman and Malheur National Forests is primarily a B/A outcome, and was projected to be an A outcome historically. Although it is assumed that the viability trend would be similar for the tricolored blackbird they are a very colonial species, distribution is very patchy and it is highly unlikely that habitat for this species actually occurs within the Blue Mountains.

Likely due to implementation of any alternative, viability for tricolored blackbirds will remain the same as current or increase due to the plan components that may lead to increased marsh size. Alt. C provides relatively the highest degree of riparian habitat protection and restoration.

When the effects of any of these alternatives are combined with the residual and expected effects of past, present, and future activities in the analysis area, there would likely be no effect or an incremental improvement in habitat for tri-colored blackbirds.

The tricolored blackbird is considered vulnerable (G3) globally (NatureServe 2012) and nationally either vulnerable or apparently secure (N3/N4). In Oregon it is only found breeding and the population is considered imperiled (S2B). The Oregon population of these blackbirds represents only 1% of the total tricolored blackbird population (Beedy et al. 1991)

Malheur National Forest

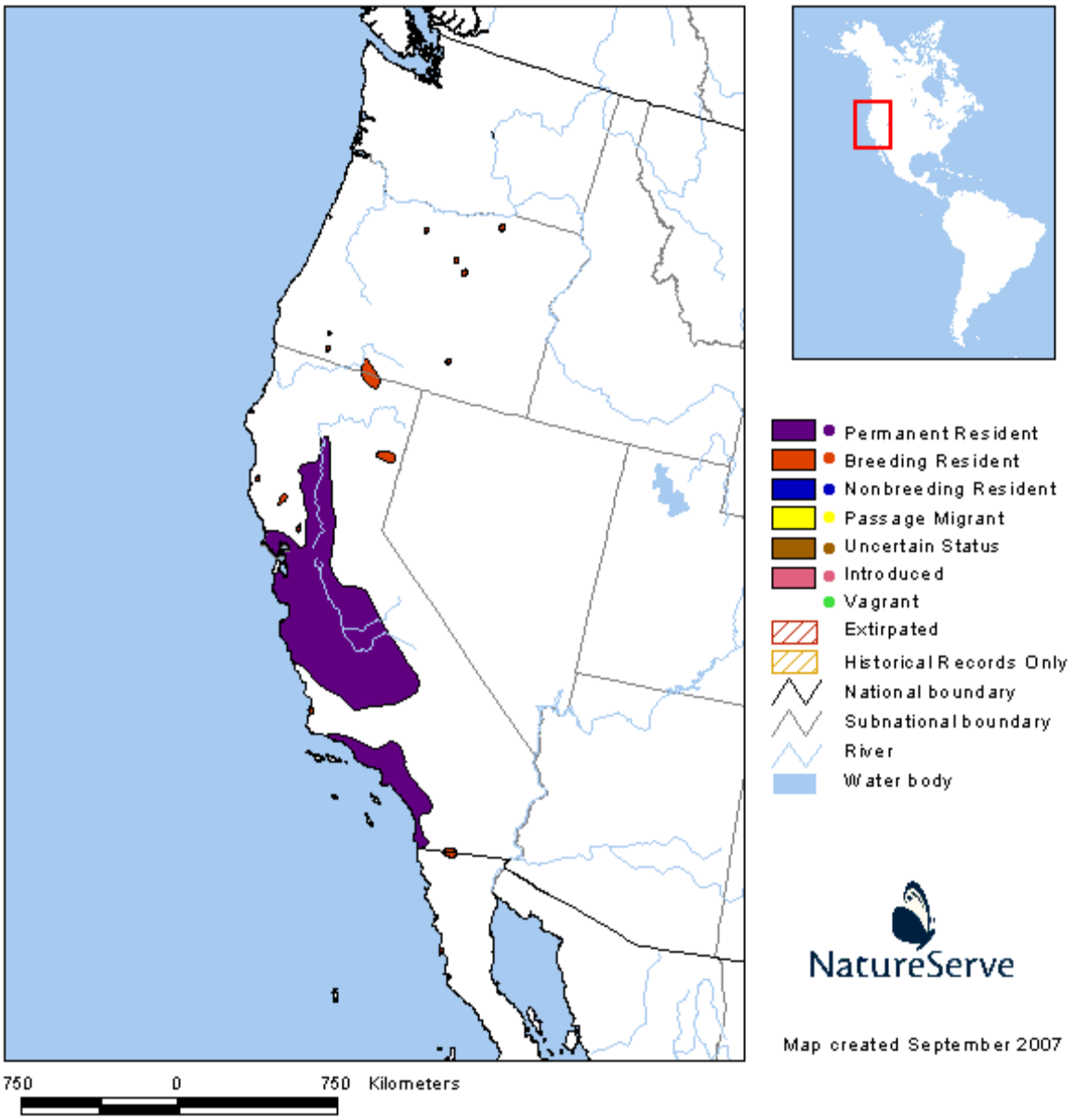
The ISSSP list this species as suspected on the Ochoco National Forest, however based on the analysis above, it is unlikely to occur on that portion of the Ochoco administered by the Malheur National Forest and the subject of this evaluation. For this reason it is likely that proposed management activities under any alternative will have **no impact** on individuals, their habitat, or viability of the population or species.

Umatilla National Forest

Suitable habitat is not known to occur and this species has not been observed in or believed to be present on the Umatilla National Forest

Wallowa-Whitman National Forest

Suitable habitat is not known to occur and this species has not been observed in or believed to be present on the Wallowa-Whitman National Forest.



Cumulative Effects on species

As indicated above, most of the risk to this species is occurring outside of public lands. There is no indication that management activities occurring on private lands will appreciably change, however because this species does not occur on the portion covered by this BE there would be no cumulative effects.

Wetland Family/Marsh-Wet Meadow Group

Bobolink

Life History and Habitat Description

Bobolinks prefer habitat with moderate to tall vegetation, moderate to dense vegetation, and moderately deep litter (Bent 1958, Bollinger 1995, Tester and Marshall 1961), and without the presence of woody vegetation (Grant et al. 2004). Bobolinks are commonly found in areas with high percent grass cover and moderate percent forb cover (Herkert 1994, Madden et al. 2000, Skinner 1974, Wiens 1969). In Colorado, Bock et al. (1999) compared the abundance of Bobolinks between upland (mixed-grass prairie) and lowland (tallgrass prairie or tame hayland) grasslands and found they were significantly more abundant on lowland than on upland plots.

Grasslands have experienced major, sometimes profound, losses from agriculture, range management, and urban development (Vickery et al. 1999) Bobolink have successfully adapted to these modified landscapes (O'Connor et al. 1999, Vickery et al. 1999) and can be found in native and tame grasslands, hay fields, lightly to moderately grazed pastures, no-till cropland, small-grain fields, wet meadows, and planted cover (Dechant et al. 1999 (revised 2001)).

This species commonly breeds at Malheur National Wildlife Refuge and at grasslands throughout southern and eastern Oregon (Marshal et al. 2003). In Oregon, breeding occurs in the following counties: Baker, Union, Harney, and Lake with the Baker population thought to be extirpated (NatureServe 2012). It does not occur within the counties of Washington in the Blue Mountains.

Threats

In Illinois the primary threat in the breeding range is habitat loss in the form of declining area in pasture, alfalfa hay and oats (Herkert 1997). In addition to habitat destruction, the factor most frequently cited for declines in bobolink populations is not only more frequent but also earlier mowing of hayfields (Bollinger et al. 1990 *in* Peterjohn and Sauer 1999, Herkert 1997). Bobolinks respond positively to properly timed burning or mowing treatments (Herkert 1994, Herkert et al. 1996; Askins et al. 2007; Dechant et al. 1999 (revised 2001)). Bobolinks may respond positively to lightly grazed areas, but moderate or heavy grazing may negatively affect bobolink populations (Bock et al. 1993; Dechant et al. 1999 (revised 2001)).

Determination of Effects

The bobolink is in the Family Riparian and the Marsh/Wet Meadow Group (USDA 2010). This group is represented by the focal species Wilson's snipe. The viability outcome for Wilson's snipe declined from an A outcome historically to primarily a B/A due to loss of habitat. Although a slight decrease in the modeled outcome for viability occurred the level of concern did not change between alternatives (Table WISN-1). Loss of marsh/wet meadow grassland habitats on NFS lands likely have not been as great as off NFS lands. Executive Order 11190 (Carter 1977) also limits the loss or conversion of this type of habitat. Many historic wetlands occurred on private lands and have been turned into irrigated fields and converted to agricultural uses, however as indicated above these still provide habitat for this species. It is assumed that the viability of the bobolink would have a similar trend as the Wilson's snipe.

Table WISN-1: Level of viability concern by national forest for the Wilson's snipe currently and projected for each alternative.

National Forest	Current	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
Umatilla	L	L	L	L	L	L	L

Malheur	L	L	L	L	L	L	L
Wallowa-Whitman	L	L	L	L	L	L	L

The desired condition under all alternatives is to maintain or increase the extent and diversity of wetlands within the Blue Mountains (1.1.3 Wetland function). Executive Order 11190 (Carter 1977) also limits the loss or conversion of this type of habitat. Additionally, all alternatives have desired conditions to restore and improve hydrologic and riparian function within watersheds (*1.1.1 Hydrologic Function**,** 1.1.2 Riparian Function, 1.1.3 Wetland Function, 1.1.4 Stream Channel Function, and 1.1.5 Aquatic Habitat Function).* Habitat for the bobolink is likely very rare on NFS lands with the only major threat being livestock grazing. As indicated above, bobolinks are tolerant of some grazing, and according to the DEIS analysis, at the broad scale of the forest current grazing roughly utilizes only 18% of the forage available on the Malheur. This would be considered "light" grazing (Holecheck et al. 2006).

According to NatureServe (2012) the bobolink has a large nesting range in North America that has expanded with historical anthropogenic habitat changes (see figure below). Populations have declined over the past several decades, likely due to incompatible agricultural practices in the nesting range as well as in the winter range (NatureServe 2012).

The bobolink is fairly evenly distributed over a broad area with no single state supporting more than about 10% of the total breeding population (Wells and Rosenberg 1999). The breeding population within the U.S. is considered secure (N5B) and in Oregon it is considered imperiled (S2B) and it is between imperiled and vulnerable (S2/S3B) in Washington (NatureServe 2012).

There is a potential for direct impacts to individual bobolinks as a result human disturbance and/or livestock grazing. This potential impact would be limited to a small number of individuals. Impacts to populations are not expected.

Malheur National Forest

There is one recorded observation for the Forest in NRIS from 1980 at the edge of a hayfield of a single male. Given the analysis above, results of the focal species assessment model, and the current global status of this species, it is likely that proposed management activities under any alternative **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

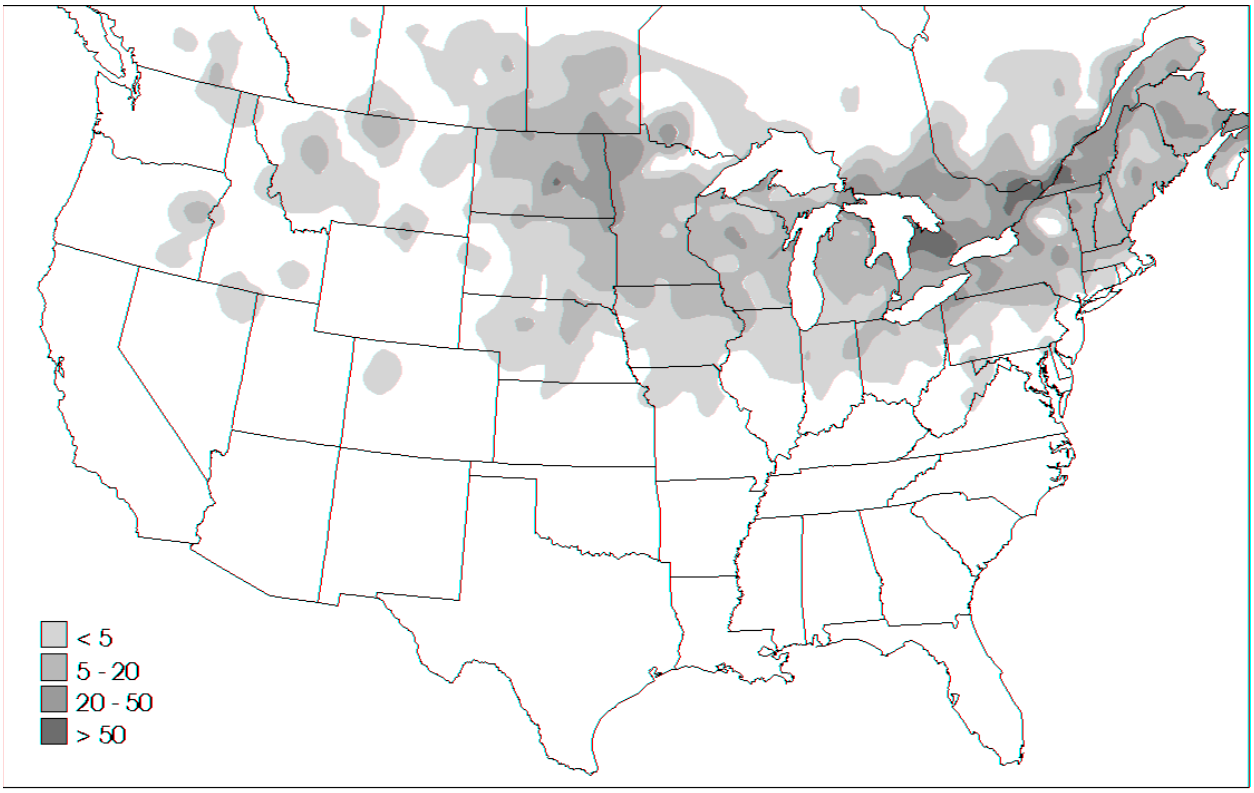
1. The focal species assessment model for this group indicated no change in the concern for viability within the plan area.
2. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
3. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Umatilla National Forest

Species is not documented nor is it suspected to occur on the Umatilla National Forest.

Wallowa-Whitman National Forest

Species is not documented nor is it suspected to occur on the Wallowa-Whitman National Forest.



Map of breeding distribution of the Bobolink in the United States and southern Canada, based on Breeding Bird Survey data, 1985-1991. Scale represents average number of individuals detected per route per year. Map from Price, J., S. Droege, and A. Price. 1995. The summer atlas of North American birds. Academic Press, London, England. 364 pages

Cumulative Effects on species

As has been indicated the recent change in agricultural practices such as changing crops or the earlier and more frequent harvests of agricultural grasslands have been implicated as a major cause of population declines in bobolinks (Perlut et al. 2006) and this will probably continue. Some authors suspect winter survivorship in South America could be contributing to the decline (Giacomo et al. 2005). Potentially, bobolinks are subject to chemical poisoning on wintering grounds by farmers attempting to protect their crops (Basili and Temple 1999)

Invertebrates

Western bumblebee (Bombus occidentalis)

Life History and Habitat Description

According to Thorp et al. (2008), bumblebee colonies are annual, starting from colony initiation by solitary queens in the spring, to production of workers, and finally to production of queens and males that mate. The entire colony (old queen, workers and males) dies out and the new queens hibernate over winter, beginning the entire process anew the following spring. Bumblebees primarily nest underground, typically in abandoned rodent nests located from six to eighteen inches below the surface (Plath 1927; Goulson, et al. 2008).

Bumblebees require habitats with rich supplies of floral resources with continuous blooming from spring to autumn (Thorp et al. 2008). They will visit a range of different plant species and are important generalist pollinators of a wide variety of flowering plants and crops (Goulson et al. 2008)

Historic *B. occidentalis* collections are typically associated with sub-alpine meadows, coastlines, and high elevation valleys. Historically, specimens of *B. occidentalis* were not collected in areas receiving little annual rainfall (i.e. the Great Basin Desert and Mojave Desert) (Koch and Strange 2009). It is a generalist forager and has also been observed nectar robbing by biting holes in flower corollas such as *Linaria vulgaris* Miller (J. Koch pers. obs. cited in Koch and Strange 2009). Rao et al. (2011) reported the collection of 49 individuals of *B.occidentalis* over a 2 year period in the Zumwalt Prairie Preserve of northeastern Oregon.

Threats

Rearing bumblebees for commercial use may be one of the greatest threats to *B. occidentalis* (Andrews 2010). Bumble bee expert Dr. Robbin Thorp has hypothesized that when western bumble bee queens were shipped to European rearing facilities they acquired a selectively virulent strain of *Nosema bombi* from the closely related and commercially reared European bumble bee *Bombus terrestris*. Thorp hypothesizes that this disease is the most probable cause for the recent declines of the three species of bumble bees in this status report and their close relative *Bombus franklini* (Thorp 2005; Thorp and Shepherd 2005). Other pests and diseases that could have been spread by commercial bumble bee producers and have led to a decline in these three species of bumble bees include *Crithidia bombi*, *Locustacarus buchneri*, and deformed wing virus. Additionally, Cameron et al. (2011) found elevated levels of the pathogen *N. bombi* in declining Bombus populations (including *b.occidentalis*) suggesting that this pathogen could also be adversely affecting this species.

In Europe, accumulating evidence suggests that narrow climatic niche breadth combined with reductions in food and nesting resources are responsible for the gradual declines observed in many *Bombus* since the 1950s. Bumble bee populations are threatened by many kinds of habitat alterations which may destroy, fragment, degrade, or reduce their food supplies (flowers that produce the nectar and pollen they require), nest sites (e.g. abandoned rodent burrows or undisturbed grass), and hibernation sites for over-wintering mated queens. These threats include agricultural intensification, livestock grazing, urban development, and fragmentation of landscapes (Thorp et al. 2008).

Livestock grazing may adversely impact bumble bee populations by (1) depleting bumble bee food sources (Sugden 1985; Carvell 2002; Kruess and Tscharntke 2002, 2002a; Vazquez and Simberloff 2003; Hatfield and LeBuhn 2007), (2) trampling of above ground nesting sites (Sugden 1985), and (3) negatively impacting nesting rodents which in turn reduces the number of nest sites available for bumble bees. Livestock grazing has differing impacts on flora and fauna based on the type, habitat, intensity, timing, and length of livestock grazing (Gibson et al. 1992; Sjodin 2007, Kimoto 2011), but there is potential for a negative impact on bee populations with many grazing situations. Hatfield and LeBuhn (2007) demonstrated that uncontrolled sheep grazing in mountain meadows removed enough flowering plants to eliminate bumble bees from study sites. Other research shows that managed grazing can benefit insect communities by managing invasive plants and allowing spring- and summer-blooming flowers to grow (Black et al. 2007). Controlled grazing has been shown to help maintain an open herbaceous-dominated plant community that is capable of supporting a wide diversity of butterflies and other pollinators (Smallidge and Leopold 1997).

In pre-settlement times, meadows were maintained by periodic fires that helped curtail conversion to forest by restricting the establishment of trees along forested edges with grasslands. Fire suppression, and resultant forest encroachment into occupied meadow patches, reduces meadow habitats available to bumble bees (Thorp et al. 2008, Hartley et al. 2007), whereas in some case prescribed burns can set this

back, benefitting some pollinators (Hartley et al. 2007, Huntzinger 2003). Some studies have found a negative or mixed response of invertebrates to fire (Potts et al. 2003, Johnson et al. 2008, Panzer 2002). Swengel (2001) in reviewing the literature found that fire was more detrimental than grazing, mowing or haying to insects.

Foraging bumblebees are directly threatened by insecticide applications when used in agricultural settings. Massive bumblebee kills have occurred as a result of insecticide application on Forest Service managed public lands intended for the control of spruce budworm (Helson et al 1994, Thorp et al. 2008). Bumblebees can be indirectly harmed when the flowers that they normally use for foraging are removed by the application of broad-spectrum herbicides (Black et al. 2007, Miller and Miller 2004)

Determination of Effects

As Black et al. (2007) pointed out, each of the management techniques discussed above can be used to manage habitat to benefit pollinators and each can have damaging, at times severe, impacts on pollinators if they are not used carefully. The main threats on National Forest Lands would be from grazing and fire. The use of insecticides to control outbreaks of insects on National Forest is neither a typical nor recurrent management action that would be addressed in the plan. These are very site and temporal specific events, and their impacts on species would be evaluated at the time of occurrence. Such a project would still be guided by the desired conditions of the plan- one of which is Desired Condition: 1.2 Species Diversity- Federally listed species trend towards recovery. Management activities improve conservation status of species identified as focal species or of local or regional conservation concern.

All alternatives in the plan envision treating noxious weeds, which could involve the use of herbicides. There are several standard and guidelines for treatment, but the actual areal extent of treatment is less than 1 percent.

Domestic livestock grazing will continue under all alternatives. According to the DEIS analysis, at the broad scale of the forest current grazing roughly utilizes 33% of the forage available on suitable grazing lands on the Wallowa-Whitman (Table 88). Holecheck et al. (2006) considers this to be a "Conservative" level of grazing and although the DEIS identifies upland utilization ranges higher than this, it is not anticipated to see a significant change in the current management of domestic grazing. The amount of area considered suitable for livestock grazing within active allotments varies by alternative (DEIS Table 91) with alternative D having the most (25% of the forest) and alternative C the least (9 %). Even at the highest level there is a large portion of the forest that will not receive grazing from domestic livestock.

As with insect outbreaks, the plan can not anticipate wildfire events. The plan does desire that natural disturbances occur at a level similar to what occurred historically, however the extent and local of such events remains unpredictable. The use of management ignited fires will vary by alternative with alternative D making the least use of this tool and alternative E making the most use. As with grazing however, the actual magnitude is projected to be small. From table TW11 in the DEIS for the Wallowa-Whitman projected management ignited fires varies from a low of 0.3 percent of the planning area under alternative D to a high of 12 percent under alternative E. Most likely such fires on forest service lands will not occur in what would be considered habitat for this species.

The western bumble bee is considered apparently imperiled or vulnerable (N2N3) nationally (NatureServe 2012). The Oregon population is considered critically imperiled or imperiled (S1S2) and the Washington population is considered critically imperiled (S2).

Malheur National Forest

Species is not documented nor is it suspected to occur on the Malheur National Forest.

Umatilla National Forest

Species is not documented nor is it suspected to occur on the Umatilla National Forest.

Wallowa-Whitman National Forest

According to the ISSSP the species is documented for the Wallowa-Whitman. Given the analysis above the magnitude of threats under any of the plan alternatives **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Much of the area with subalpine meadows is in management areas that will not have active management (i.e., wilderness).
2. The use of insecticides to control outbreaks of insects on National Forest is neither a typical nor recurrent management action that would be addressed in the plan. These are very site and temporal specific events, and their impacts on species would be evaluated at the time of occurrence.
3. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
4. Plan components under all alternatives provide adequate protection to ameliorate many of the identified risks to this species and its habitat.

Cumulative Effects on species

Many of the threats to this species are occurring off forest. Oregon has restricted importation of certain bee species which may reduce the risk of disease to the western bumble bee. Land management practices occurring on private lands that could be detrimental to this species such as intense livestock grazing and agricultural practices are not expected to change. Because of this species proclivity for higher elevations some authors have postulated that climate change could negatively impact this species.

Meadow Fritillary (Boloria bellona)

Life History and Habitat Description

The meadow fritillary (*Boloria bellona*) is a medium sized brown colored butterfly of the family Nymphalidae which has recently been listed as sensitive. Adults fly between late May and late August. There are two generations of adults in a year. Larvae of the late summer generation overwinter. Eggs are laid on and the larvae feed primarily on violets (Pyle 2002, Swengel 1997). In British Columbia, Canada Guppy and Shepard (2001) state that *Viola canadensis* is the only food plant. Its preferred habitat is open, boggy, wet meadows (Miller and Hammond 2007). In the west this species can be found in meadows and openings in aspen and pine woodlands from 2-5,000 feet (Fleckenstein 2006). Eastward mostly in moist, but not really wet, artificial grasslands such as hay meadows, pastures, roadsides usually on rich soils but also in some natural wetlands such as sedge meadows (NatureServe 2012).

This species is widely distributed across the northern montane regions of North America. It is well distributed in Alaska, the Yukon, and Northwest Territories. Colonies of meadow fritillary are localized in the Pacific Northwest and historically are known from 16 sites in the Blue Mountains and SE Washington, but these have mostly disappeared (Miller and Hammond 2007).

Threats

Reasons for extirpation of several populations are not known; however grazing is one suspected cause (Fleickenstein 2006). Miller and Hammond (2007) suggest that loss of wet meadow habitat due to draining, overgrazing by livestock or encroachment of woody habitat (willows and hawthorns) into wet meadows are harmful to this species. Swengel (2001) indicated mixed responses from prairie butterflies to grazing, depending on intensity and species. On the other hand, according to Opler et al. (2013) this butterfly is expanding its range southward from the southeastern states due to its adaptability to disturbed habitats.

Boloria bellona exhibited substantial population declines following prescribed fires in midwest prairies (Vogel et al. 2010; Swengel 1996). Swengel (2001) found that in some cases localized butterfly populations responded favorably to certain types of fire. She concluded that while fire-caused insect mortality may be great, postburn vegetation can also be attractive to recolonizing insects and that butterflies respond more favorably to a single occasional wildfire than to rotational burning.

Determination of Effects

The meadow fritillary is only considered sensitive in Washington.

The desired condition under all alternatives is to maintain or increase the extent and diversity of wetlands within the Blue Mountains (1.1.3 Wetland function). Executive Order 11190 (Carter 1977) also limits the loss or conversion of this type of habitat. Additionally, all alternatives have desired conditions to restore and improve hydrologic and riparian function within watersheds (*1.1.1 Hydrologic Function, 1.1.2 Riparian Function, 1.1.3 Wetland Function, 1.1.4 Stream Channel Function, and 1.1.5 Aquatic Habitat Function).*

The anticipated amount of management ignited fire varies between alternatives from a high of approximately 10% for alternative C to 0% for alternative D over the first decade (DEIS Table 310). Less than 35% of the national forest lands in the Washington Blue Mountains are within MA 4 (active management area), meaning that 65% will not see active management other than livestock grazing which only occurs on approximately 28% of the area. Because the overreaching intent of all alternatives is to move towards the historical range of variation, it seems extremely unlikely that there would be long term negative effects with the implementation of any of the alternatives proposed.

Domestic livestock grazing will continue under all alternatives. According to the DEIS analysis, at the broad scale of the forest current grazing roughly utilizes 22% of the forage available on suitable grazing lands on the Umatilla (Table 88). Holecheck et al. (2006) considers this to be a "light" level of grazing and although the DEIS identifies upland utilization ranges higher than this, it is not anticipated to see a significant change in the current management of domestic grazing. The amount of area considered suitable for livestock grazing within active allotments varies by alternative (DEIS Table 90) with alternative D having the most (23% of the forest) and alternative C the least (3 %). Even at the highest level there is a large portion of the forest that will not receive grazing from domestic livestock.

Nationally this specie is considered secure (N5) and is listed as possibly imperiled (S2?) in Washington (NatureServe 2012). Fleckenstein (2006) reported that 16 sites occurred in the Blue Mountains of Washington, however Opler et al. (2013) does not indicate sightings on that portion of the Umatilla National Forest located in Washington. It has not been identified as a priority species for Washington (Larsen et al. 1995, WDFW 2008).

Umatilla National Forest

It is suspected that this species might occur on the Umatilla National Forest but there are no confirmed records of its occurrence. Given the analysis above the magnitude of threats under any of the plan alternatives **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. More than 65 percent of the Washington portion of the Blue Mountains is in management areas that are not actively managed (i.e., wilderness or roadless areas).

2. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.

3. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

Many of the threats to this species are occurring off forest. Land management practices occurring on private lands that could be detrimental to this species such as intense livestock grazing and agricultural practices are not expected to change.

Silver-Bordered Fritillary (Boloria selene)

Life History and Habitat Description

While populations of this butterfly are widely distributed across northern and montane regions of North America, silver-bordered fritillary tend to be localized and endemic in the Pacific Northwest. LaBonte et al. (2001) documents this species in only two locales in Oregon, several meadows in the Ochoco Mountains in Crook and Grant Counties and a population in the southern end of the Wallowa Mountains in Baker County. According to Miller and Hammond (2007) only two primary colonies are found in Oregon, one at Big Summit Prairie on the Ochoco National Forest and one in the Strawberry Mountains on the Malheur National Forest. Opler et al. (2013) on the other hand lists historical occurrences of these butterflies only for the Malheur and Wallowa Whitman National Forests. Finally, Andrews (2010b) indicates that these butterflies have been found in Big Summit Prairie, Crook Co. the Strawberry Mountains, Grant Co., and in the Southern Wallow Range north of Halfway, and Baker County.

The silver-bordered fritillary inhabits open, boggy, wet meadows (Miller and Hammond 2007) and true bogs which support violets (*Viola* spp.) usually located within low- to mid-elevation forests (Larsen et al. 1995). Open riparian areas and marshes containing a large amount of Salix and larval food plants also provide habitat (Warren 2005). Caterpillar host plants consist of violets, including pioneer violet (*Viola glabella*) and northern bog violet *V. nephrophylla*, (Pyle 2002). Adult nectar plants are composite flowers including goldenrod (*Solidago* spp.) and black-eyed Susan (*Rudbeckia* spp.). Emergence and flight of adults begins in June through July, with a second generation flight occurring late summer and fall during August through September (Miller and Hammond 2007).

Threats

Drainage of water from the bogs, overgrazing by domestic livestock, and overgrowth of the meadows by woody brush, such as willows and hawthorns, are harmful to this species (Miller and Hammond 2007). Habitats known to contain these butterflies should be managed to maintain hydrology and the continued

existence of violets by monitoring willow succession (Andrews 2010b). Habitat succession and drying have put many populations under stress (Pyle 2002). Vegetation treatments to reduce conifer encroachment may be needed at some sites. The use of pesticides or herbicides which may negatively impact this butterfly or the northern bog violet should be avoided (Larsen et al. 1995).

Determination of Effects

The desired condition under all alternatives is to maintain or increase the extent and diversity of wetlands within the Blue Mountains (1.1.3 Wetland function). Executive Order 11190 (Carter 1977) also limits the loss or conversion of this type of habitat. Additionally, all alternatives have desired conditions to restore and improve hydrologic and riparian function within watersheds (*1.1.1 Hydrologic Function, 1.1.2 Riparian Function, 1.1.3 Wetland Function, 1.1.4 Stream Channel Function, and 1.1.5 Aquatic Habitat Function).* Alternatives B, E and F have a guideline (PL-TES-3) that "Domestic livestock grazing should not be authorized or allowed in the fens/bogs sensitive plant habitat groups."

It is assumed that livestock grazing would be managed in a manner to achieve the expressed desired conditions of the plan. Based on both utilization and stocking levels, Alternative C, followed by E and F would be the least detrimental to riparian habitats based utilization levels given in standard and guideline MA 4B RMA-RNG-2 G-115 for riparian management areas (MA 4B). Alternative D would be the least favorable towards riparian species in that more acres are being proposed for domestic livestock grazing and the riparian management area is the narrowest of all of the alternatives. In all cases, guideline MA 4B RMA-1 G-101 (shown in table below) applies to all alternatives, which states that projects will not result in long-term degradation of riparian and aquatic habitats. Monitoring data conducted as part of the PACFISH/INFISH Biological Opinion (PIBO) effort (Archer et al. 2009) have indicated on a broad scale that there has been a recovery in several areas for many of the parameters most closely associated with livestock grazing effects. Analysis of PIBO data for the three national forests also indicates a favorable trend in many of the parameters important to this species.

The use of insecticides to control outbreaks of insects on National Forest is neither a typical nor recurrent management action that would be addressed in the plan. These are very site and temporal specific events, and their impacts on species would be evaluated at the time of occurrence. All alternatives in the plan envision treating noxious weeds, which could involve the use of herbicides. There are several standard and guidelines for treatment, but the actual areal extent of treatment is less than 1 percent. Such projects would still be guided by the desired conditions of the plan- one of which is 1.2 Species Diversity- Federally listed species trend towards recovery. Management activities improve conservation status of species identified as focal species or of local or regional conservation concern.

Boloria selene is globally ranked G5- widespread, abundant and secure throughout its range and in Oregon this species of butterfly is ranked S2- imperiled (NatureServe 2012).

Malheur National Forest

According to the ISSSP the species is documented for the Malheur. Given the analysis above the magnitude of threats under any of the plan alternatives **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. The use of insecticides to control outbreaks of insects on National Forest is neither a typical nor recurrent management action that would be addressed in the plan. These are very site and temporal specific events, and their impacts on species would be evaluated at the time of occurrence.

2. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.

3. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Umatilla National Forest

Species is not documented nor is it listed as suspected to occur on the Umatilla National Forest.

Wallowa-Whitman National Forest

According to the ISSSP the species is documented for the Wallowa-Whitman. Given the analysis above the magnitude of threats under any of the plan alternatives **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. The use of insecticides to control outbreaks of insects on National Forest is neither a typical nor recurrent management action that would be addressed in the plan. These are very site and temporal specific events, and their impacts on species would be evaluated at the time of occurrence.

2. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.

3. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

Many of the threats to this species are occurring off forest. Land management practices occurring on private lands that could be detrimental to this species such as intense livestock grazing, draining of wet areas and agricultural practices are not expected to change.

Great Basin Fritillary (Speyeria egleis)

Life History and Habitat Description

Adults are flying in mid-summer, from mid-June through early September and eggs hatch in the fall with the larvae overwinter without feeding (Fleckenstien 2006a). Larvae feed on violets including *Viola nuttalli, V. purpurea, and V. adunca* (Pyle 2002). They are usually found in mountain meadows, forest openings and exposed rocky ridges (Opler et al. 2013). Forested habitats are not checked off because the species apparently uses openings, edges, etc. in such situations not the forest proper (NatureServe 2012). Fritillaries are generally strong fliers and can probably colonize new sites within a few kilometers of an existing population (Fleckenstein 2006a).

In WA, a few records in the Okanogan Highlands, Paloouse Hills, and S. Cascades, more in the Blue Mountains; the concentration in the Blue Mountains and Pyle's (2002) comments about their regularity there suggest stable populations in this area (Fleckenstien 2006a).

Threats

Its habitat, clearings and mountain ridges, faces no particular threat, although over-grazing could be a problem (Fleckenstein 2006a). No particular management considerations are thought necessary on federal lands at this time.

Whether butterflies can retreat to potential high elevation refugia will depend in part on their ability to disperse sufficiently rapidly to accommodate changes in temperature and precipitation along the elevational gradient. If larval hostplants, adult nectar sources, and appropriate microclimates simply move gradually upward across entire mountain ranges, butterflies should be able to track these necessary resources (Fleishman et al. 2001)

Determination of Effects

The Great Basin fritillary is only considered sensitive in Washington.

It is expected that Great Basin fritillary would have similar trends in habitat as the focal species for open forest habitats- the western bluebird. The viability outcome for western bluebird declined from historical due to open canopied forests being well below the HRV median in most areas across the 3 planning units. The viability outcome for the western bluebird is primarily an E on the three planning units.

The viability outcome for the western bluebird historically was projected to be an A, while currently on all three national forests the viability outcome is projected to be an E (Wales et al. 2011). This results in a high to moderate-high level of concern for the viability of the western bluebird across all three forests (Table WB-1). The main factor leading to this level of concern is the historic loss of open habitats within the forested community resulting in levels far below HRV for these habitats. At the same time it should be pointed out that this habitat type was highly abundant and still is common across all three forests. In all likelihood, source habitat for the Great Basin fritillary would follow a similar pattern as the western bluebird resulting in a similar viability concern.

Domestic livestock grazing will continue under all alternatives. According to the DEIS analysis, at the broad scale of the forest current grazing roughly utilizes 22% of the forage available on suitable grazing lands on the Umatilla (Table 88). Holecheck et al. (2006) considers this to be a “light” level of grazing and although the DEIS identifies upland utilization ranges higher than this, it is not anticipated to see a significant change in the current management of domestic grazing. The amount of area considered suitable for livestock grazing within active allotments varies by alternative (DEIS Table 90) with

alternative D having the most (23% of the forest) and alternative C the least (3 %). Even at the highest level there is a large portion of the forest that will not receive grazing from domestic livestock.

Nationally this specie is considered secure (N5) and is listed as possibly imperiled (S2?) in Washington (NatureServe 2012). Fleckenstein (2006a) reported that it has been found in Washington on the Umatilla National forest. It has not been identified as a priority species for Washington (Larsen et al. 1995, WDFW 2008).

Table WB-1: Level of viability concern by national forest for the western bluebird currently and under each alternative.

	Level of viability concern						
		Alternative					
National Forest	Current	A	B	C	D	E	F
Umatilla	H	H	H	H	M/H	M	H
Malheur	H	H	H	H	M/H	M/H	H
Wallowa-Whitman	H	H	H	H	M/H	M/H	H

Umatilla National Forest

This species has been documented for the Umatilla National Forest. Given the analysis above the magnitude of threats under any of the plan alternatives **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. The focal species assessment model for this habitat (western bluebird) indicated no increase in the concern for viability within the plan area.
2. More than 65 percent of the Washington portion of the Blue Mountains is in management areas that are not actively managed (i.e., wilderness or roadless areas).
3. Further evaluations will occur at the project level for any proposal that may affect this species or its habitat.
4. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

Many of the threats to this species are occurring off forest. Land management practices occurring on private lands that could be detrimental to this species such as intense livestock grazing and agricultural practices are not expected to change.

Barry's Hairstreak (Callophrys gryneus barryi)

Life History and Habitat Description

According to taxonomy recognized by Fleckenstein (2006b), this subspecies is rare in SE WA and widespread in the eastern part of OR, being common in some places. According to Warren (2005) this taxon is not valid and populations should be lumped with the more widespread *C. g. chalcosiva*. Larsen et

al. (1995) stated that presently it is difficult to distinguish this species [Juniper hairstreak-*Mitoura siva ssp.*] from the basin hairstreak butterfly (*M. barryi*), except by genital dissection. WDFW currently uses genus *Mitoura* and common name Juniper Hairstreak (WDFW 2008).

Juniper hairstreaks are associated with Rocky Mountain juniper (*Juniperus scopulorum*) and western or Sierra juniper (*Juniperus occidentalis*) -- both in juniper/shrub-steppe composite, and in juniper covered hills and dunes (Larsen et al. 1995). Found in juniper woodland and openings in forest with junipers present. Eggs are laid singly on tips of host plant leaves, which the caterpillars eat (Opler et al. 2013). Larvae feed on western juniper (*Juniperus occidentalis*) and possibly on Rocky Mountain juniper (*Juniperus scopulorum*).

Distribution in Washington: The species has a large range in Washington, much of which is under surveyed with more locations likely to be found (Fleckenstein 2006b). Known records are scattered across large parts of the southern Columbia Basin and Blue Mountains (see map below from WDFW 2008). Opler et al. (2013) does not include Garfield County in their database of locations for Washington. It is known from the Umatilla National Forest in Washington (Fleckenstein 2006b).

Juniper Hairstreak
Mitoura grynea barryi

Washington Distribution by County*

State Status: Candidate
Federal Status: None

PHS Species Criteria

#1

Priority Area

- Any occurrence

Online information and guidelines for management of **Juniper Hairstreak**:

Management Recommendations for Washington's Priority Species: Invertebrates

NatureServe Species Report

Determination of Effects

Barry's hairstreak is only considered sensitive in Washington.

Dealey (1990) indicates that the greatest abundance of Western juniper occurs in central Oregon with stands more limited in size extending up the valleys and foothills of the southern Blue Mountain region with small groups or individuals scattered sparsely through the northern Blue Mountains into Washington (figure WJ-1). According to Shaughnessy and O'neil (2001), juniper woodland habitat does not occur in Washington, which is also supported by the vegetation data used for Umatilla National Forest for plan revision analysis. Since this species has been documented in counties containing the Blue Mountains, habitat must exist, however the discussion above would indicate that habitat for this species would be extremely limited within the National Forest.

The Forest Service manages little potential habitat for this species on the Umatilla National Forest. Also there is little management proposed in the juniper that is expected to negatively affect this species. Livestock grazing may occur however, there is no indication that managed grazing will negatively affect this species. All alternatives are proposing to manage towards HRV and this would include juniper woodlands. All alternatives also envision a decrease in the spread of exotic vegetation that might degrade the quality of these habitats.

Globally this specie is considered secure (G5); it is not ranked nationally and is listed as possibly imperiled (S2?) in Washington (NatureServe 2012). Fleckenstein (2006b) reported that it has been found in Washington on the Umatilla National forest and it has been identified as a priority species for Washington (Larsen et al. 1995, WDFW 2008).

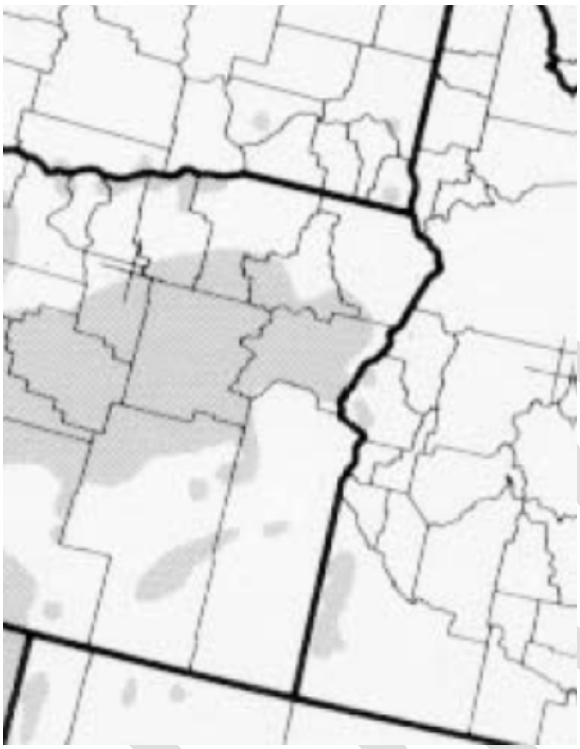


FIGURE WJ-1: RANGE OF WESTERN JUNIPER FROM DEALEY 1990.

Umatilla National Forest

Although the ISSSP list and Fleckenstein (2006b) indicate that this species is documented for the Umatilla National Forest, there are no observations documented in the NRIS database. Given the analysis above the magnitude of threats under any of the plan alternatives **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Habitat appears to be extremely limited for this species in Washington.

2. More than 65 percent of the Washington portion of the Blue Mountains is in management areas that are not actively managed (i.e., wilderness or roadless areas).

3. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

Many of the threats to this species are occurring off forest. Land management practices occurring on private lands that could be detrimental to this species such as juniper removal and agricultural practices are not expected to change.

Johnson's Hairstreak (Mitoura johnsoni)

Life History and Habitat Description

These butterflies occur within coniferous forests which contain the mistletoes of the genus *Arceuthobium*, commonly referred to as dwarf mistletoe. These plants are highly specialized and are known to occur on a number of different conifers (Schmitt and Spiegel 2008). Old-growth and late successional second

growth forests provide the best habitat for this butterfly, although younger forests where dwarf mistletoe is present also supports *C. johnsoni* populations (Larsen et al. 1995; Miller and Hammond 2007, LaBonte et al. 2001). Older coniferous forests, especially those with a heavy component of western hemlock (*Tsuga heterophyla*) that are infected by dwarf mistletoe (*Arceuthobium tsugense*) appear to be its key habitat (Andrews 2010a, Miller and Hammond 2007, Larsen et al. 1995). In Washington, it is only know to occur west of the Cascade crest (Larsen et al. 1995). A disjunct population occurs at the Oregon/Idaho border in Baker and Union counties, Oregon and Adams County, Idaho (figure 1). This disjunct population may be a relict population isolated by climate changes (Davis et al. 2011).

Perhaps one reason for infrequent sightings of this butterfly could be due to the species spending a majority of its time in the top of the forest canopy (Pyle 2002).

Eggs are laid on conifer mistletoe (*Arceuthobium spp*.) and the larvae feed exclusively on the aerial shoots of dwarf mistletoe plants (LaBonte et al. 2001). Caterpillars secrete a sugary solution which ants utilize. In return, the ants help protect the caterpillar from predators. Adults are diurnal and fly in the forest canopy during June and July. This species is thought to be important in helping to keep mistletoe in balance. The primary host trees for dwarf mistletoes associated with *C. johnsoni* presence are western hemlock (*Tsuga heterophylla*), white fir (*Abies concolor)* and Ponderosa pine (*Pinus ponderosa*). Dwarf mistletoe can occur on all age classes of forest (Muir and Hennon 2007), but is most abundant in mature stands and old-growth. Adult Johnson's Hairstreaks are seldom seen, perhaps because they spend most of their adult life high in the forest canopy (Andrews 2010a).

The Johnson's hairstreaks in the Cascades, Sierras and on the coast have been found feeding on dwarf mistletoe of mountain hemlock and digger pine (Shields 1965), while those found in northeastern Oregon have been found feeding on western dwarf mistletoe (*A. campylopodum*) on ponderosa pine (McCorkle 1973 *in* Davis and Weever 2011).

Threats

Habitat destruction could have a negative impact upon this species of butterfly (Larsen et al. 1995). It has been speculated that old growth forests are particularly suitable to this species of butterfly, although *Arceuthobeium* mistletoes also occur in younger forests as well where there is an absence of recent large scale disturbance (Schmitt and Spiegel 2008). While much of the literature indicates that this butterfly is dependent on large, old, closed-canopy old-growth (Miller and Hammond 2007; Pyle 2002), this is based on collections and sightings in the moist fir/hemlock forests of the Cascades and West Coast. Forests providing western dwarf mistletoe (*Arceuthobium campylopodum*) habitat in the Blue Mountains are typically open to provide sun that allows ponderosa pine to regenerate.

The bacterium *Bacillus thuringiensis* var. *kurstaki* (BTK) is lethal to many butterfly and moth larvae when consumed. According to (Wagner and Miller 1995), BTK was applied in large-scale aerial treatments to control spruce budworm during the 1990's in the Washington and Oregon Cascades. It has been speculated that the continued use of this bacterium to control certain species of Lepitopterans could also significantly reduce populations of *C. johnsoni* due to its ability to kill many other Lepidopteran larvae. Currently this pesticide is the most popular in western forests to control defoliators

Herbicides which are applied to flowering plants which adult *C. johnsoni* visit could negatively affect population levels (Larsen et al. 1995).

Determination of Effects

Although some reduction in dwarf mistletoe occurrence has occurred due to logging, infected conifers are still common in northeastern Oregon, and current dwarf mistletoe levels are not believed to be

substantially less than historic levels in this area (Schmitt and Spiegel 2008). All alternatives have the desired condition to move towards HRV. This includes disturbance factors such as insects and disease occurrence as well as forest age and structure. A reduction in mistletoe has probably occurred due to large stand replacement fires in the last several decades, with probably a longer term reduction with Douglas-fir dwarf mistletoe because of its shade tolerance (Schmitt and Spiegel 2008). Hessburg et al. (1999) reported an increase in connectivity and patch size of areas vulnerable to Douglas-fir mistletoe. Because all alternatives emphasize the restoration of ponderosa pine there is the possibility of reducing potential habitat for this species by removing Douglas-fir and grand fir that have encroached on ponderosa pine sites.

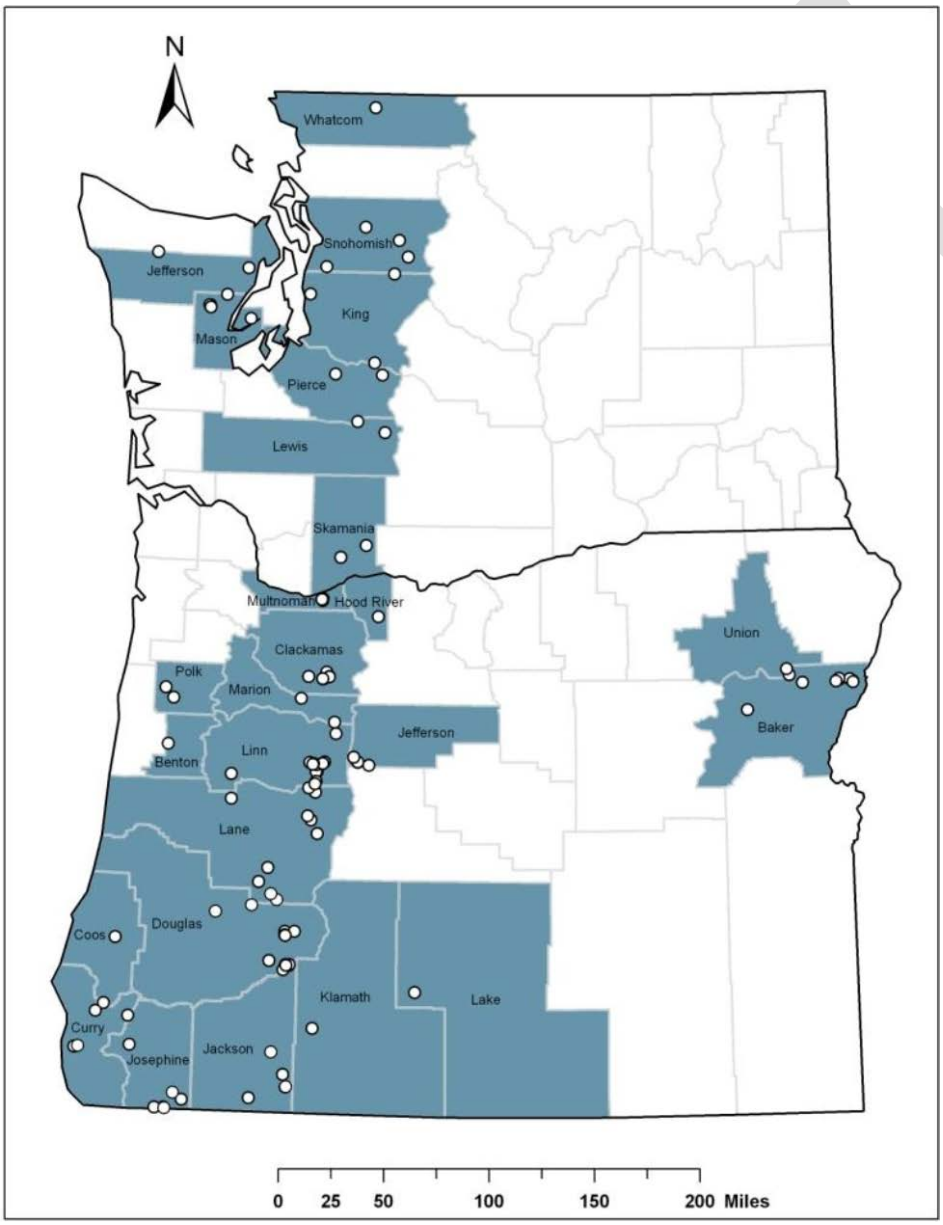


Figure 1: Current known geographic distribution of Johnson's Hairstreak butterfly (*Callophrys johnsoni*) records in Oregon and Washington (all records dating back to 1891).

The use of insecticides to control outbreaks of insects on National Forest is neither a typical nor recurrent management action that would be addressed in the plan. These are very site and temporal specific events, and their impacts on species would be evaluated at the time of occurrence. Such a project would still be guided by the desired conditions of the plan- one of which is Desired Condition: 1.2 Species Diversity- Federally listed species trend towards recovery. Management activities improve conservation status of species identified as focal species or of local or regional conservation concern.

All alternatives in the plan envision treating noxious weeds, which could involve the use of herbicides. There are several standard and guidelines for treatment, but the actual areal extent of treatment is less than 1 percent.

The Johnson's hairstreak is considered vulnerable (G3) globally and vulnerable or apparently secure (N3/N4) nationally (NatureServe 2012). The Oregon population is considered imperiled (S2) and the Washington population is considered imperiled/vulnerable (S2/S3).

Malheur National Forest

It is suspected that this species might occur on the Malheur National Forest but there are no confirmed records of its occurrence in the NRIS database. Given the analysis above the magnitude of threats under any of the plan alternatives **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. The focal species assessment model for this habitat (white-headed woodpecker) indicated no increase in the concern for viability within the plan area.
2. The use of insecticides to control outbreaks of insects on National Forest is neither a typical nor recurrent management action that would be addressed in the plan. These are very site and temporal specific events, and their impacts on species would be evaluated at the time of occurrence.
3. Further evaluations will occur for any project proposal that may affect this species or its habitat
4. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Umatilla National Forest

It is suspected that this species might occur on the Umatilla National Forest but there are no confirmed records of its occurrence in the NRIS database. Given the analysis above the magnitude of threats under any of the plan alternatives **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. The focal species assessment model for this habitat (white-headed woodpecker) indicated no increase in the concern for viability within the plan area.
2. The use of insecticides to control outbreaks of insects on National Forest is neither a typical nor recurrent management action that would be addressed in the plan. These are very site and temporal specific events, and their impacts on species would be evaluated at the time of occurrence.
3. Further evaluations will occur for any project proposal that may affect this species or its habitat

4. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Wallowa-Whitman National Forest

Although the ISSSP list this as only suspected for the Wallowa-Whitman, the NRIS database contains 10 recorded observations, with the most current being in 2005 and 2009. Davis and Weever (2011) reported collection from two localities on this forest in 2010. In northeastern Oregon sightings of *C. johnsoni* have been documented in or adjacent to the Baker City watershed, and the North Pine Creek and East Pine Creek areas in the Southern Wallowa Mountains (Schmitt and Spiegel 2008). Given the analysis above the magnitude of threats under any of the plan alternatives **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. The focal species assessment model for this habitat (white-headed woodpecker) indicated no increase in the concern for viability within the plan area.
2. The use of insecticides to control outbreaks of insects on National Forest is neither a typical nor recurrent management action that would be addressed in the plan. These are very site and temporal specific events, and their impacts on species would be evaluated at the time of occurrence.
3. Further evaluations will occur for any project proposal that may affect this species or its habitat
4. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

Wildfires have been the most important single factor governing the distribution and abundance of dwarf mistletoes (Hawksworth and Wiens 1996). The effects of fire on presence of dwarf mistletoe are mostly negative, as fires have been documented to reduce the abundance of dwarf mistletoes (Conklin and Armstrong 2001, Zimmerman and Laven 1987).

Intermountain Sulpher (Colias christina pseudochristina)

Life History and Habitat Description

This species inhabits open woodland from 3400 to 5000 feet, including meadows, roadsides, and open forest and is most often found on steep sunny slopes at the ecotone between forest and shrubsteppe or grassland habitats (Foltz 2009). Hammond (*In* Foltz 2009) describes the subspecies habitat as sagebrush with scattered Ponderosa Pine, including both south- and east-facing slopes. The larvae of this subspecies feed on *Lathyrus* species, including *L. brachycalix, L. lanzwertii, L. puciflorus,* and. *L. nevadensis* (Foltz 2009). The Asotin County population in Washington was reported to feed on *L. puciflorus* (*reviewed in* Warren 2005). Adults of *C. christina* use a variety of plants as nectar sources, and males may occasionally be seen frequenting mud puddles (Warren 2005).

Threats

Loss of habitat due to agricultural conversion and development are the primary threats to this species. Pesticide use also poses serious threats, and aerial spraying of Btk (Bacillus thuringiensis var. kurstaki) for forest defoliating moths has weakened and eliminated several populations of this subspecies in eastern

Oregon (Hammond , pers. comm. in Foltz 2009). Additionally, the widespread spraying of Dimilin, pyrethroids, and organophosphates for grasshopper control occurs yearly in the range of this species (Blom and Brown 2012), and may pose further threats**.**

Determination of Effects

The use of insecticides to control outbreaks of insects on National Forest is neither a typical nor recurrent management action that would be addressed in the plan. These are very site and temporal specific events, and their impacts on species would be evaluated at the time of occurrence. All alternatives in the plan envision treating noxious weeds, which could involve the use of herbicides. There are several standard and guidelines for treatment, but the actual areal extent of treatment is less than 1 percent. Such projects would still be guided by the desired conditions of the plan- one of which is 1.2 Species Diversity- Federally listed species trend towards recovery. Management activities improve conservation status of species identified as focal species or of local or regional conservation concern.

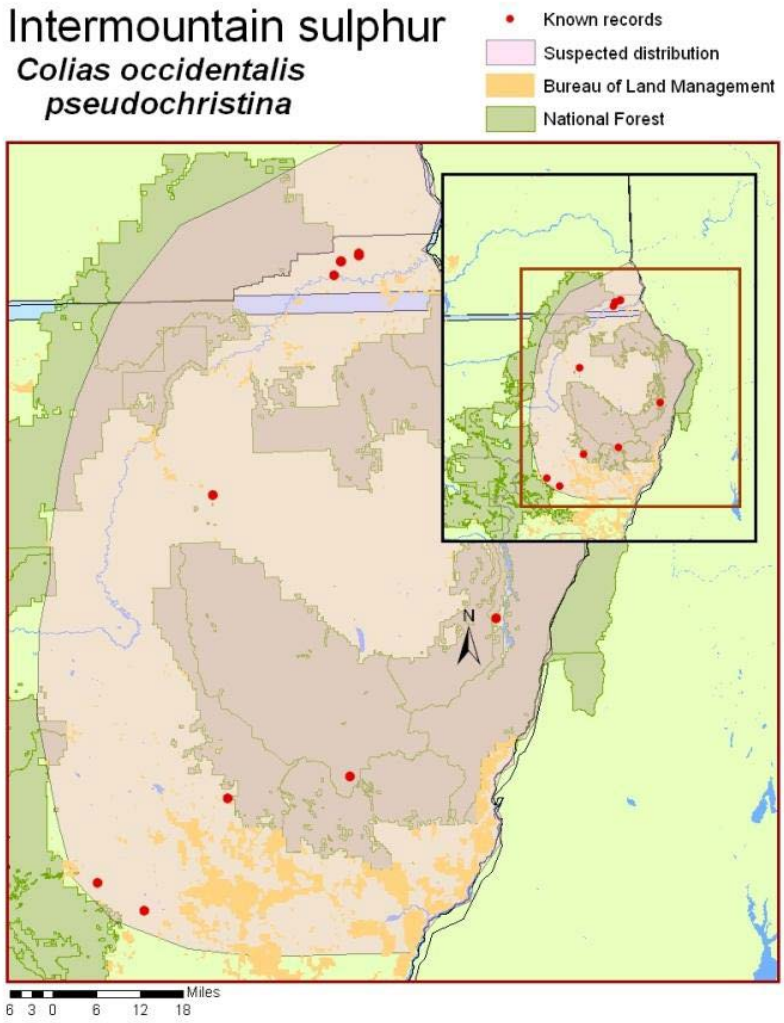


Figure 1. Known records and suspected distribution of *C. o. pseudochristina* in OR and WA. Map made by S. Foltz, 2009

The species is under review and has not been ranked by NatureServe (2012) and therefore the subspecies is not ranked for Oregon.

Malheur National Forest

Species is not documented nor is it suspected to occur on the Malheur National Forest.

Umatilla National Forest

It is suspected that this species might occur on the Umatilla National Forest but there are no confirmed records of its occurrence in the NRIS database and a recent survey did not observe them (Carleton et al. 2012). Given the analysis above the magnitude of threats under any of the plan alternatives **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. The use of insecticides to control outbreaks of insects on National Forest is neither a typical nor recurrent management action that would be addressed in the plan. These are very site and temporal specific events, and their impacts on species would be evaluated at the time of occurrence.
2. Further evaluations will occur for any project proposal that may affect this species or its habitat
3. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Wallowa-Whitman National Forest

According to the ISSSP the species is documented for the Wallowa-Whitman. Given the analysis above the magnitude of threats under any of the plan alternatives **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. The use of insecticides to control outbreaks of insects on National Forest is neither a typical nor recurrent management action that would be addressed in the plan. These are very site and temporal specific events, and their impacts on species would be evaluated at the time of occurrence.
2. Further evaluations will occur for any project proposal that may affect this species or its habitat
3. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

Many of the threats to this species are occurring off forest. Land management practices occurring on private lands that could be detrimental to this species such as juniper removal and agricultural practices are not expected to change.

Lustrous Copper (Lycaena cupreus)

Life History and Habitat Description

Habitat is mountain ridges and slopes, meadows, and talus fields with Washington records being from 6,000 feet and higher (Fleckenstein 2006c). NatureServe (2012) lists the following as habitat types: alpine, bare rock/talus/scree, grassland/herbaceous and tundra and sometimes along streams in mountains.

Females lay eggs singly on or near host plant leaves of the knotweed family (Polygonaceae) including alpine sorrel (*Rumex pauciflorus*), and other *Rumex* and *Oxyria* species; which the caterpillars then eat (Opler et al. 2013). Adults fly once, usually in August in Washington and half-grown caterpillars hibernate (Fleckenstein 2006c, Opler et al. 2013). Dornfeld (1980 in Fleckenstein 2006c) says yarrow and pussy paws are common nectar sources.

Threats

High elevation habitats not threatened and most populations face few short-term threats however global warming may threaten most populations because they occur at relatively high elevation (NatureServe 2012).

Determination of Effects

The lustrous copper butterfly is sensitive only in Washington. Since the habitat for this species is considered alpine, the analysis for the rosy finch species is most likely applicable. Using the GIS layers developed by the Washington Wildlife Habitat Connectivity Working Group (WHCWG) they do not identify alpine areas or areas over 2,000 meters in elevation for the Umatilla National Forest in Washington which are habitat attributes given for this species. Even so, Fleckenstein (2006c) suggests that it may occur on the Umatilla National Forest in Washington.

The Cold Herbland (UH) PVG used in the plan analysis probably incorporates the habitat for the lustrous copper. In Washington there is approximately 2500 acres of this PVG on National Forest, none of which is in an active domestic sheep allotment. The gray-crowned rosy-finch was the focal species for this habitat. A detailed discussion of this habitat was presented earlier under the rosy-finch discussion. It does not appear that the literature indicates any significant threat to the lustrous copper other than climate change.

This species is considered secure both globally (G5) and nationally (N5) and is listed as imperiled (S2) in Washington (NatureServe 2012).

Umatilla National Forest

The ISSSP list indicates that this species is suspected for the Umatilla National Forest, there are no observations documented in the NRIS database. Given the analysis above the magnitude of threats under any of the plan alternatives **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. The focal species assessment for this habitat (gray-crowned rosy-finch) indicated no increase in the concern for viability within the plan area.
2. More than 65 percent of the Washington portion of the Blue Mountains is in management areas that are not actively managed (i.e., wilderness or roadless areas).
3. Suitable habitats for this species are thought to be extremely limited on the Umatilla and what does occur would have very limited if any active management.
4. Plan components under all alternatives provide adequate protection to ameliorate the identified risks from management to this species and its habitat.

Cumulative Effects on species

While most populations face few short-term threats, global warming may threaten most populations because they occur at relatively high elevation (Fleckenstein 2006c).

Yuma Skipper (Ochlodes yuma)

Life History and Habitat Description

O. yuma is found around reed beds in and around freshwater marshes, streams, oases, ponds, seeps, sloughs, springs, and canals (Larsen et al. 1995, Opler, et al. 2013). Adults are almost always found in close association with the primary larval host plant *Phragmites australis* (common reed). A few butterflies are restricted to a single plant species and this is true for all geographic races of *Ochlodes yuma*, whose larvae consume only *Phragmites australis* (Cary et al. 2011). In Oregon and Washington adults have one flight period from early July to early September, peaking in August and feed on a variety of flowers including thistles and yellow composites (Pyle, 2002 as cited in Black et al. 2007a).

Oregon and Washington represent the northern end of the Yuma skipper's range. This recently discovered Washington species is found on state park lands (only in Grant County) and represents the dramatic disjuncture of a Great Basin extreme specialist (Larsen et al. 1995). In Oregon *O. yuma* is known from three widely separated areas (Warren 2005, Pyle 2002 as cited in Black et al. 2007a); 1) locally common near Summer Lake in Lake County; 2) commonly found along the Imnaha River in Wallowa County; and 3) along the lower Columbia River in Wasco, Sherman, and Hood River counties.

According to Hammond (1994) this butterfly was probably widespread during the last glacial maxima when lakes and marshes filled the lowlands of the Great Basin. With climatic drying it became a relict in widely disjunct habitats where it is usually abundant within its limited habitat.

Threats

As a species *O. yuma* is widely distributed and relatively secure (Opler, et al. 2013, NatureServe 2012). However in Oregon and Washington it is known from only a few populations in three widely separated areas. Site specific threats are unknown but general threats include loss of wetland habitats to urban or agricultural uses, pesticide spraying (especially the use of organophosphates and pyrethroids for mosquito control), and grazing damage to wetland habitat (Hammond, 1994).

There is a question about the ability of *O. yuma* to use the non-native strain of *P. australis*; if *O. yuma* are unable to utilize the non-native strain of *P. australis*, then the colonization of *O. yuma* habitat by non-native strains of *P. australis* would likely be a threat to this skipper (Black et al. 2007; Cary et al. 2011). However, O. y. sacramentorum is known to use the non-native strain of *P. australis* (Pelham personal communication as cited in Black et al. 2007) as well as *O. yuma* in Nevada (Nelson 2009).

<u>Determination of Effects</u>

The Yuma skipper has a very specific habitat requirement (common reed) which is not found abundantly on National Forest lands within the Blue Mountains.

Phragmites australis occupies an ecological niche that is vulnerable to invasion by non-native plants, as several of Oregon's riparian communities have been altered by invasive species (ODFW 2006). Invasive plants that have invaded riparian zones in the region include Japanese knotweed, purple loosestrife, perennial pepperweed, and reed canary grass (*Ibid*). Any future infestations could prompt management actions and any such actions could pose potential threats to other wetland plants, such as *P. australis*.

Management efforts to control invasive plant populations could pose a threat to the butterfly. Resource managers should carefully evaluate control of invasive species in areas occupied by OYA.

Several species associated with wetland/riparian habitats, such as the tri-colored black bird, Columbia spotted frog and bobolink have been previously discussed in this document. Human activities within or adjacent to riparian habitat is a concern for some species but none of the alternatives would cause this to worsen and it was not identified as a threat for this species. Riparian areas, lakes, and wetlands are protected under all management direction. Executive Order 11190 (Carter 1977) also limits the loss or conversion of this type of habitat. All alternatives establish Riparian Management Areas that have several standard and guidelines that should alleviate some of the risks posed to ethis species. Monitoring data conducted as part of the PACFISH/INFISH Biological Opinion (PIBO) effort (Archer et al. 2009) have indicated on a broad scale that there has been a recovery in several areas for many of the parameters most closely associated with livestock grazing effects. Analysis of PIBO data for the three national forests also indicates a favorable trend in many of the parameters important to this species.

In general, alternative C should see the greatest improvement and the most rapid recovery of riparian and wetland areas due to the reduced area subjected to domestic livestock grazing and the stricter utilization levels within those areas that are subject to grazing. Additionally, alternative C establishes the most acres within riparian management areas (RMAs) and has the widest buffer zone. Alternative D would be the least favorable towards riparian species in that more acres are being proposed for domestic livestock grazing and the riparian management area is the narrowest of all of the alternatives. Alternatives A, B, E, and F would be similar in impacts as the amount of area dedicated to domestic livestock grazing is the same and the RMA widths are also the same. There are several standards and guidelines for RMAs that apply to most alternatives, which also will provide for recovery.

This species is considered secure both globally (G5) and nationally (N5) and is listed as critically imperiled (S1) in Washington and Oregon (NatureServe 2012).

Malheur National Forest

Species is not documented nor is it suspected to occur on the Malheur National Forest.

Umatilla National Forest

It is suspected that this species might occur on the Umatilla National Forest but there are no confirmed records of its occurrence in the NRIS database. Given the analysis above the magnitude of threats under any of the plan alternatives **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Little active management is anticipated to occur within this species habitat.
2. Further evaluations will occur for any project proposal that may affect this species or its habitat
3. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Wallowa-Whitman National Forest

According to the ISSSP the species is documented for the Wallowa-Whitman. Given the analysis above the magnitude of threats under any of the plan alternatives **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. Little active management is anticipated to occur within this species habitat.
2. Further evaluations will occur for any project proposal that may affect this species or its habitat
3. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

The non-native genotype of common reed grass is considered a noxious weed in both Oregon and Washington. Because of this, control efforts occur in both states and could affect the Yuma skipper, especially those populations occurring along the Columbia River as it is suspected that the common reed grass found here may be the non-native genotype (ODA 2009 (revised 2013)). Elsewhere in the US, responses to invasion of common reed have included massive herbicide application campaigns (e.g., Chambers et al. 1999). Destruction of OYA's sole larval host plant, whether a native or non-native genotype, would pose a real problem for the butterfly.

Fir Pinwheel (Radiodiscus abietum)

Life History and Habitat Description

The fir pinwheel (*Radiodiscus abietum*) is a land snail that is generally found in moist, rocky, forested terrain. Most often found in moist and rocky Douglas-fir (*Pseudotsuga menziesii*) forest at mid-elevations in valleys and ravines (Frest et al. 1997). At some Montana locations, Western Red Cedar (*Thuja plicata*) formed the canopy (Hendricks 2003). Often this species is found in or near talus of a variety of rock types or under fallen logs (Frest and Johannes 1995, Hendricks et al. 2008, Jepsen et al. 2011a; 2012). Moist sites are preferred and tend to be near permanent water, such as riparian corridors but outside the flood plain, and in dense conifer forests where there is more precipitation, litter and decaying wood (Hendricks 2003).

Historic records for this species include the Blue Mountains of Washington and Oregon, a string of western Idaho and Idaho Panhandle counties (Bonner, Kootenai, Shoshone, Clearwater, Nez Perce, Idaho, and Adams), Montana and extreme northeast Washington. *Radiodiscus abietum* is known from the Blue Mountains in extreme northeastern Oregon above Weston in Umatilla County (Duncan 2008) and more recently on the Umatilla National Forest from Tiger Creek, Thomas Creek, and the Umatilla River in Oregon as well as the Touchet River in Washington (Jepsen et al. 2011, 2012). Although it was once probably very common and widespread, it is absent from many historic sites and has not been found in great numbers anywhere. The fir pinwheel appears to represent a relicit of the time in which mixed conifer/deciduous forests covered the entire northern hemisphere (Nekola et al 2011).

Threats

Activities that lead to drying of sites are considered a major concern (Duncan 2008). Threats include logging of relatively intact moderate-elevation Douglas fir forest; grazing of much of the logged terrain; road construction and other river right-of-way impacts; severe forest fires (Frest and Johannes 1995, Hendricks 2003). Rural home development and land clearing also represent threats, as could fire suppression retardants and chemical methods of weed control (Hendricks 2003). Logging and grazing that alter appropriate habitat are probably the greatest threats over most of the known range (Duncan 2008). According to Hendricks (2003) canopy removal through logging and fire are probably the most significant disturbances for the forest-inhabiting species such as the fir pinwheel. While some level of

exposure in the physical environment is tolerated by certain mollusks, most species are extremely sensitive to temperature and moisture extremes (Jordon and Black 2012).

Determination of Effects

The following describes general effects to land snails from forest management and is based on the synthesis provided in Jordon and Black (2012).

- Research suggests that the majority of snails and slugs are dependent on litter from deciduous trees and have higher abundances in multispecies forests with strong broadleaf components. Additionally, mollusks in deciduous forests appear to rebound from disturbance more quickly than in coniferous forests. Also forests with old-growth characteristics supply microhabitat and microclimate conditions capable of supporting a diversity of mollusks, and forest age is often positively correlated with mollusk richness and abundance.

Forestwide direction for each of the Blue Mountains national forests and all alternatives is to move towards HRV. Use of HRV relies on two concepts: that past conditions and processes provide context and guidance for managing ecological systems today, and that disturbance-driven spatial and temporal variability is a vital attribute of nearly all ecological systems. All alternatives have the same desired conditions for old forest-

> Old forests are sustained by the ecological processes under which they developed historically. In addition old forest stands would be guided by desired conditions for other items such as disturbance processes, stand density, species composition, snags, down wood, landscape patterns and special habitats.

Old forest areas are not included in lands suitable for timber production under all alternatives except D. Because of the deficit of old forest structure, even-aged regeneration harvests were not scheduled within current old forest stands, and only minimal harvest of trees (single tree selection or small group selection) was assumed. None of the alternatives envision any reduction in stands that currently display old forest characteristics. Additionally, as indicated above, old forest attributes important to this species such as coarse woody debris and special habitats, are to be managed toward their desired conditions which are that they occur across the landscape in space, time and patterns similar to what occurred historically.

- Numerous studies stress the importance of refugia in gastropod re-colonization potential and community resilience following forest disturbance. Since land mollusks are small animals with limited mobility and dispersal capabilities, the maintenance of refugia in disturbed habitat is particularly important for this group. Refugia should include logs, snags, fallen branches, and other forms of coarse woody debris, as well as areas with thick leaf-litter. Woody debris and litter provide islands of habitat, food, and protection from microclimatic extremes, increasing species' tolerance of temporarily inhospitable environments.

As indicated above, very little mechanical activity within old forest areas is anticipated due to management activities for any of the alternatives. As can be seen from Table 341 in the DEIS, over the first decade, less than 10 percent of each PVG is expected to receive mechanical treatment under the most aggressive alternative (Alt D). This would indicate that implementing any alternative would still maintain much of the forest in potential "refugia" for land snails. Furthermore, even within those areas that are treated, important habitat attributes such as coarse woody debris need to be managed to achieve the desired conditions for that attribute, meaning that it should occur across the landscape in space, time and patterns similar to what occurred historically.

- Research suggests that in order to reduce microclimate extremes and protect gastropods, partial cuts should be favored over clearcuts, aggregated (group) retention over dispersed retention or thinning, and larger group retention over smaller group retention. In particular, harvesting with large group retention helps to maintain pre-harvest boreal gastropod assemblages and will likely conserve boreal gastropod species if used as a tool for biodiversity management.

As stated in the DEIS (see *Harvest analysis minimum management requirements assumptions* in the Forested Vegetation, Timber Resources, and Wildland Fire section) "Even-aged regeneration harvests (clearcut, shelterwood, and seed tree) would not occur in old forest (allocated or unallocated to a management area), regardless of the VDDT model group in which it occurs." This means that none of the alternatives would use these harvest methods within old growth and therefore none of the alternatives would appreciably impact land snails.

- Fragmented habitat limits the dispersal and post-disturbance re-colonization potential of gastropods. Tracts of intact forest and connected groups of old trees help provide dispersal corridors for gastropods and can lead to significant increases in the survival of disturbance-sensitive species**.**

Snails have very limited mobility, with long distance movements being considered in meters instead of longer distances (Baur 1993). The low-mobility of terrestrial gastropods is compounded by the general lack of directionality to what little movement they do have (Baur and Baur 1993). As such fragmented habitat occurs at a scale impossible to analyze in detail at the forest plan scale. In general however, the desired conditions for all alternatives should allow some connectivity within habitats. For example, coarse woody debris should be maintained within all of those stands that are mechanically treated providing not only refugia but also travelways within habitats. All alternatives provide some protection from disturbance within riparian areas. Due to their linear nature, riparian areas can link a range of different habitats, thus facilitating biotic movement through an otherwise unsuitable landscape.

- Due to the tendency of mollusks to avoid non-vegetated and/or dry environments, even narrow, unpaved roads with low traffic densities are barriers to the dispersal of mollusks.

Roads act not only as barriers but can also result in direct mortality to individuals as well as degrade snail habitat. None of the alternatives for the Forest Plan envision any appreciable new construction of roads. In fact most anticipate a reduction in the current quantity of roads open to public travel. Alternative D maintains the current level of open roads, but again, does not anticipate any new construction. As such, implementing any of the alternatives would not result in any change in the impacts to land snails from roads.

- Numerous studies have found negative and long-lasting responses of gastropods to fire, including population extirpation and reductions in abundance and species richness. Small burns surrounded by unburned plots have been most successful at maintaining gastropod community structure. Although there is little information comparing gastropod responses to differences in burn severity and frequency, it is presumed that a fire regime involving low-intensity burns at infrequent fire-return intervals (>5 years) would best maintain gastropod communities.

Although natural and anthropogenic fire have played major roles in shaping forest ecosystems in the Pacific Northwest (Agee 1993, Heyerdahl et al. 2001), the impacts of fire management on invertebrate communities are often highly variable (Swengel 2001). Fire has the potential to negatively influence gastropods in several ways: directly, by fire-related mortality, and indirectly, by altering microclimate conditions, and by reducing, eliminating, or otherwise altering resources, including vegetation, fungi,

leaf-litter, duff, woody debris, and other habitat elements pertaining to shelter or food. For most animals, indirect effects of habitat loss influence communities much more dramatically than direct effects of heat, smoke, or flames (reviewed in Kiss & Magnin 2006).

As can be seen from Table 310 in the DEIS, over the first decade, less than 10 percent of any PVG is expected to receive prescribed fire treatments under the most aggressive alternative (Alt E/F). Additionally, prescribed burns tend to be small due to the logistics of control and normally burns occur as a mosaic of burned and unburned areas within the perimeter of the project area. In addition, implementation of this management activity must also meet the desired conditions of the plan which would indicate that the prescription must be designed to maintain coarse woody debris and should be patterned after historical fire return intervals.

One final caveat- habitat attributes such as moist talus slopes or individual downed logs, important to species like snails, are at scale that cannot realistically be mapped at the level of a national forest. The plan relies on an appropriate analysis at the project level for such fine scale habitat attributes which will ensure that the plan's desired conditions are being met; including that "The natural range of habitats for native and desired non-native fish, wildlife, and native plant species, including threatened and endangered species, species identified as regional forester's sensitive species (RFSS), and focal species, is of adequate quality, distribution, and abundance to contribute to maintaining native and desired non-native species diversity. This includes the ability of species and individuals to interact, disperse, and find security within habitats in the planning area. These habitat conditions are resilient and sustainable considering the range of possible climate change scenarios."

Habitat for the fir pinwheel would generally be included in the closed moist PVG of the plan analysis. The desired conditions of the plan are to manage plant composition and density at levels that approximate what is estimated to have occurred historically. In the case of the closed moist PVG the desire is to have 60-80 percent of this density and PVG across the landscape (see table A-15 Appendix A, DEIS). The Umatilla NF is currently below the desired amount as is the Wallowa-Whitman but to a lesser degree (see table 278 and 281 of the DEIS), but all alternatives are within the desired range at the end of 20 years, indicating an improvement in habitat for this species. Commercial treatment of the moist forest PVG over the first decade is less than 10 percent under any alternative (see table 341of the DEIS) for both the Umatilla (1.0% - 7.3%) and the Wallowa-Whitman (0.7% - 5.8%). None of the treatments envision removal of the canopy from older Douglas fir forests. Use of prescribed fire is less than 4 percent under any alternative as well (see table 310 in the DEIS)

Due to their preference for riparian corridors, they will most likely be found within the riparian management areas (MA 4B) established by each alternative. This special management area has over 40 different standards and guidelines that will reduce the severity of potential threats to this species (e.g., MA 4B RMA-1G-101: Project activities in RMAs should not result in long-term degradation to aquatic and riparian conditions at the watershed scale. Limited short term or site-scale effects from activities in RMAs may be acceptable when they support, or do not diminish, long-term benefits to aquatic and riparian resources.) And lastly, habitats such as talus slopes (utilized by this species) are identified as "special habitats" in the proposed plan under all alternatives with the desired condition that they are persistent across the landscape and that they provide high quality habitat for associated species.

Because of its penchant for talus and/or rocky habitats they are probably largely buffered from logging, fire and grazing impacts due to the specific types of rocky terrain they occupy (Hendricks 2003). The talus habitat is often deep enough to provide the necessary humidity and temperature regimes that will

protect them logging and fire. For individuals in more exposed sites, they are threatened by trampling and reduction of plant cover and potential food from grazing. All alternatives have a desire to approximate historical conditions which includes the composition and structure in the understory, and therefore grazing should be managed to achieve this end. Additionally, all alternatives have guidelines for utilization of the herbaceous and shrub components in the uplands (RNG-5) and riparian management areas (MA 4B RMA-RNG-2 G-115) which should prevent utilization levels that would result in desiccation of these habitats.

This species is considered apparently secure both globally (G4) and nationally (N4) and is listed as critically imperiled (S1) in Oregon and vulnerable (S3) in Washington (NatureServe 2012).

Malheur National Forest

Species is not documented nor is it suspected to occur on the Malheur National Forest.

Umatilla National Forest

As indicated above this species has been recently documented to occur on the Umatilla National Forest. Given the analysis above the magnitude of threats under any of the plan alternatives **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. The focal species assessment model for this habitat (American marten) indicated no increase in the concern for viability within the plan area.
2. largely buffered from logging, fire and grazing impacts due to the specific types of rocky terrain they occupy and the plan does not envision any extensive new road building
3. None of the treatments envision removal of the canopy from older Douglas fir forests.
4. Further evaluations will occur for any project proposal that may affect this species or its habitat
5. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Wallowa-Whitman National Forest

According to the ISSSP the species is documented for the Wallowa-Whitman. Given the analysis above the magnitude of threats under any of the plan alternatives **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. The focal species assessment model for this habitat (American marten) indicated no increase in the concern for viability within the plan area.
2. largely buffered from logging, fire and grazing impacts due to the specific types of rocky terrain they occupy
3. None of the treatments envision removal of the canopy from older Douglas fir forests.
4. Further evaluations will occur for any project proposal that may affect this species or its habitat
5. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

Because of the extremely limited mobility of terrestrial mollusks it is unlikely that cumulative effects would occur to any populations on forest service lands. It is uncertain what impacts climate change may have, but it would be safe to assume a reduction in habitats due to the predicted increase in temperature.

Salmon Coil (Helicodiscus salmonaceus)

Life History and Habitat Description

This xerophilic species is found in dry rocky habitats, often intermixed with sage brush and grasses. Known records are from talus; rocky rubble at the base of large boulders; rocky soil with grass and shrubs; talus and basalt cliff areas; and under rocks in a rock pile (Jordon 2011, Jepsen *et al.* 2011). Reported elevations are from 733 to 1028 feet. At the Idaho sites, it inhabits talus or rock outcrops at low to moderate elevations, typically at comparatively dry, open sites with sage scrub (Frest and Johannes 1997). The recent Oregon record is from talus on a north facing slope among Douglas fir, Ponderosa pine, and Rocky Mountain maple, with Pacific ninebark and bunchgrasses in the understory (Jepsen *et al.* 2011). Rather widespread in distribution, this species is considered limited by the occurrence of its rocky habitat (Jordon 2011).

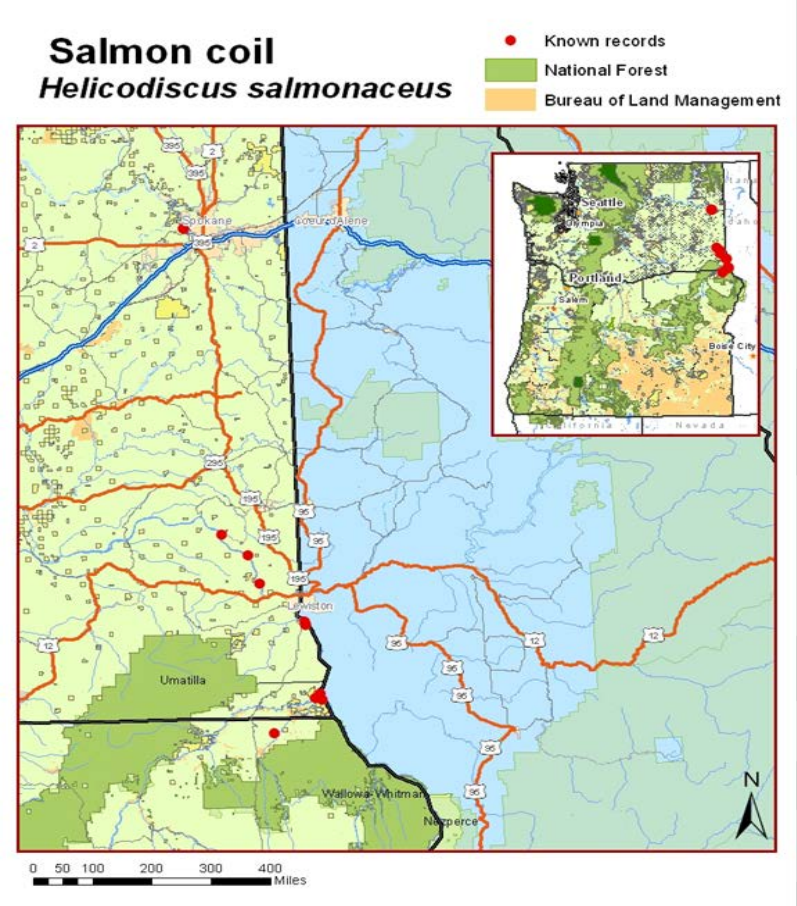
In Washington, it is known from Spokane, Whitman, and Asotin Counties. The Asotin County observations occurred on the Vale District of BLM (Jepsen et al. 2011) and WDFW property (Jepsen *et al.* 2012).

Threats

Although limited, the habitat of this species is probably not highly threatened by forest management activities, other than road building which is considered the main threat (Jordon 2011). Other activities that disturb the terrain structure, litter composition/abundance, or moisture levels could also threaten the species as well as spraying of herbicide/insecticides (Jordon and Black 2012). Climate change may pose an additional threat in this region. While some level of exposure in the physical environment is tolerated by certain mollusks, most species are extremely sensitive to temperature and moisture extremes (Jordon and Black 2012).

<u>Determination of Effects</u>

Please refer to the general discussion of forest management effects to land snails under the fir pin wheel Salmon coils are listed as sensitive only in Washington and are probably largely buffered from management impacts due to the specific types of rocky terrain they occupy (Hendricks 2003). None of the alternatives envision any appreciable increase in road construction and although road maintenance will continue, new impacts to potential habitat would not be expected. Although his species is listed as suspected to occur on the Umatilla National Forest, based on habitat, dry open sites from elevations below 1100 feet and known occurrence (see following map from Jordon 2011), it would be appear highly unlikely.



This species is considered apparently secure both globally (G4) and nationally (N4) and is listed as imperiled/vulnerable (S2/S3) in Washington (NatureServe 2012).

Umatilla National Forest

According to the ISSSP the species is suspected to occur on the Umatilla National Forest. Given the analysis above the magnitude of threats under any of the plan alternatives **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. largely buffered from logging, fire and grazing impacts due to the specific types of rocky terrain they occupy largely buffered from logging, fire and grazing impacts due to the specific types of rocky terrain they occupy and the plan does not envision any extensive new road building
2. Management activities are expected to be very minimal in this species habitat
3. More than 65 percent of the Washington portion of the Blue Mountains is in management areas that are not actively managed (i.e., wilderness or roadless areas).
4. It appears doubtful that this species would occur on the Washington portion of the Umatilla National Forest.
5. Further evaluations will occur for any project proposal that may affect this species or its habitat

6. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

Because of the extremely limited mobility of terrestrial mollusks it is unlikely that cumulative effects would occur to any populations on forest service lands. It is uncertain what impacts climate change may have, but it would be safe to assume a reduction in habitats due to the predicted increase in temperature.

Humped Coin (Polygyrella polygyrella)

Life History and Habitat Description

This species is generally found in moist Douglas fir (*Pseudotsuga menziesii*) and spruce (*Picea*) forests, often in association with rock outcrops (Frest and Johannes 1995). The habitat is described as damp forest habitats, in litter and under logs and other woody debris (Jepsen et al. 2011). The substrate can be quite variable, including basalt, schist, and limestone (Frest and Johannes 1995). In general, it is found in partly open forest with a rich understory, including diverse forbs, mosses, and deciduous shrubs. The largest colonies occur in forested taluses. Moist valley, ravine, gorge, or talus sites are preferred, i.e. low on a slope and near permanent or persistent water, but not normally subject to regular or catastrophic flooding. Persistence of moisture increases the suitability of the habitat (Frest and Johannes 1995). Forest cover in Montana included western red cedar (*Thuja plicata*), western hemlock (*Tsuga heterophylla),* grand fir (*Abies grandis*), Douglas-fir (*Pseudotsuga menziesii*), alder (*Alnus*), black cottonwood (*Populus trichocarpa*), and mountain maple (*Acer spicatum*). Snails at these sites were found in south-facing lava slide on ferns, and in leaf litter and bryophyte mats (Hendricks et al. 2007, 2008). This species is a mesophile, but can tolerate moderately xerophilic conditions in rock taluses.

Frest and Johannes (1995) describes habitat as partly open forested talus with rich understory, and diverse forbs, mosses and deciduous shrubs. Moist sites are preferred, low on slope or near persistent water sources, but outside of floodplains. The 2009 site along the Touchet River in the Umatilla NF is in streamside debris, in a forest of grand fir, Douglas-fir, and Sitka spruce (Leonard 2009, Richart 2009 as cited in Duncan 2008a).

Jepsen et al. (2012) summarized the known locations for this species in Washington, indicating that it was documented at two locations in both Asotin and Columbia counties and one location in Walla Walla County. The most recent location was along the Touchet River on the Umatilla National Forest in Columbia County (Jepsen et al. 2011).

Threats

Disturbance to refugia sites and/or moisture regime as a result of grazing, road building and tree removal may cause population declines at local sites. Drying of sites is considered a major concern. While some level of exposure in the physical environment is tolerated by certain mollusks, most species are extremely sensitive to temperature and moisture extremes (Jordon and Black 2012).

Determination of Effects

Please refer to the general discussion of forest management effects to land snails under the fir pin wheel. The hump coin is listed as sensitive only in Washington and they are probably largely buffered from management impacts due to the specific types of rocky terrain they occupy. Habitat for the hump coin would generally be the moist PVG of the plan analysis. The desired conditions of the plan are to

manage plant composition and density at levels that approximate what is estimated to have occurred historically. In the case of the closed moist PVG the desire is to have 60-80 percent of this density and PVG across the landscape (see table A-15 Appendix A, DEIS). The Umatilla NF is currently below the desired amount (see table 278 of the DEIS), but all alternatives are within the desired range at the end of 20 years, indicating an improvement in habitat for this species. Commercial treatment of the moist forest PVG over the first decade is less than 8 percent under any alternative (see table 341of the DEIS) for the Umatilla (1.0% - 7.3%). None of the treatments envision removal of the canopy from older Douglas fir forests causing desiccation of the habitat. Use of prescribed fire is less than 4 percent under any alternative as well (see table 310 in the DEIS)

Under all alternatives except D, this species will most likely be found within the riparian management areas (MA 4B) established by each alternative. This special management area has over 40 different standards and guidelines that will reduce the severity of potential threats to this species (e.g., MA 4B RMA-1G-101: Project activities in RMAs should not result in long-term degradation to aquatic and riparian conditions at the watershed scale. Limited short term or site-scale effects from activities in RMAs may be acceptable when they support, or do not diminish, long-term benefits to aquatic and riparian resources.) And lastly, habitats such as talus slopes (utilized by this species) are identified as "special habitats" in the proposed plan under all alternatives with the desired condition that they are persistent across the landscape and that they provide high quality habitat for associated species.

Because the hump coin prefers talus and/or rocky habitats they are probably largely buffered from logging, fire and grazing impacts due to the specific types of rocky terrain they occupy (Hendricks 2003). The talus habitat is often deep enough to provide the necessary humidity and temperature regimes that will protect them logging and fire. For individuals in more exposed sites, they are threatened by trampling and reduction of plant cover and potential food from grazing. All alternatives have a desire to approximate historical conditions which includes the composition and structure in the understory, and therefore grazing should be managed to achieve this end. Additionally, all alternatives have guidelines for utilization of the herbaceous and shrub components in the uplands (RNG-5 and RNG-6 G-47) and riparian management areas (MA 4B RMA-RNG-2 G-115) which should prevent utilization levels that would result in desiccation of these habitats.

This species is considered vulnerable both globally (G3) and nationally (N3) and is listed as critically imperiled (S1) in Washington (NatureServe 2012).

Umatilla National Forest

According to the ISSSP the species is documented to occur on the Umatilla National Forest. Given the analysis above the magnitude of threats under any of the plan alternatives **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. largely buffered from logging, fire and grazing impacts due to the specific types of rocky terrain they occupy and the plan does not envision any extensive new road building
2. None of the treatments envision removal of the canopy from older Douglas fir forests.
3. More than 65 percent of the Washington portion of the Blue Mountains is in management areas that are not actively managed (i.e., wilderness or roadless areas).

4. Further evaluations will occur for any project proposal that may affect this species or its habitat
5. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

Because of the extremely limited mobility of terrestrial mollusks it is unlikely that cumulative effects would occur to any populations on forest service lands. It is uncertain what impacts climate change may have, but it would be safe to assume a reduction in habitats due to the predicted increase in temperature.

Shiny Tightcoil (Pristiloma wascoense)

Life History and Habitat Description

Most sites for this species are in ponderosa pine (*Pinus ponderosa*) and Douglas fir (*Pseudotsuga menziesii*) forests at moderate to high elevations (Frest and Johannes 1995). The eastern Washington record is from a relatively moist, shaded basalt cliff and with talus and *Populus* cover (Frest and Johannes 1995). Burke and Leonard (cited in Jordon 2010) describe the habitat as primarily under deciduous trees, particularly quaking aspen (*Populus tremuloides*) and red alders (*Alnus* sp.). Other *Pristiloma* species in the ecoregion are known to prefer moist microsites such as basalt talus accumulations, usually with riparian influence (Jordan 2010). According to Jordon and Black (2012) tightcoil snails are old-forest dependent species.

This species is reported from many widely separate (but often imprecise) historic locations. It is known from the Washington and Oregon Cascades (Jordon 2010) and Frest and Johannes (1995) indicate that they collected a specimen in eastern Washington but do not indicate a county. Jepsen et al. (2011, 2012) found *P. idahoensis* on the Umatilla National Forest in Umatilla County in Oregon during their mollusk survey of this area. Based on this and the following map (from Jordon 2010), it would appear that this species does not occur on the Umatilla NF in Washington.

It is also reported from the Blue Mountains in Oregon (Wallowa Valley above Wallowa Lake in Wallowa County) (Pilsbry 1946, Frest and Johannes 1999 as cited in Jordon 2010). The species seems to occur rarely in Oregon and surveys in recent years in appropriate areas have failed to relocate it; a number of sites in Wasco County, Oregon, were unsuccessfully surveyed for this taxon (Frest and Johannes 1995).

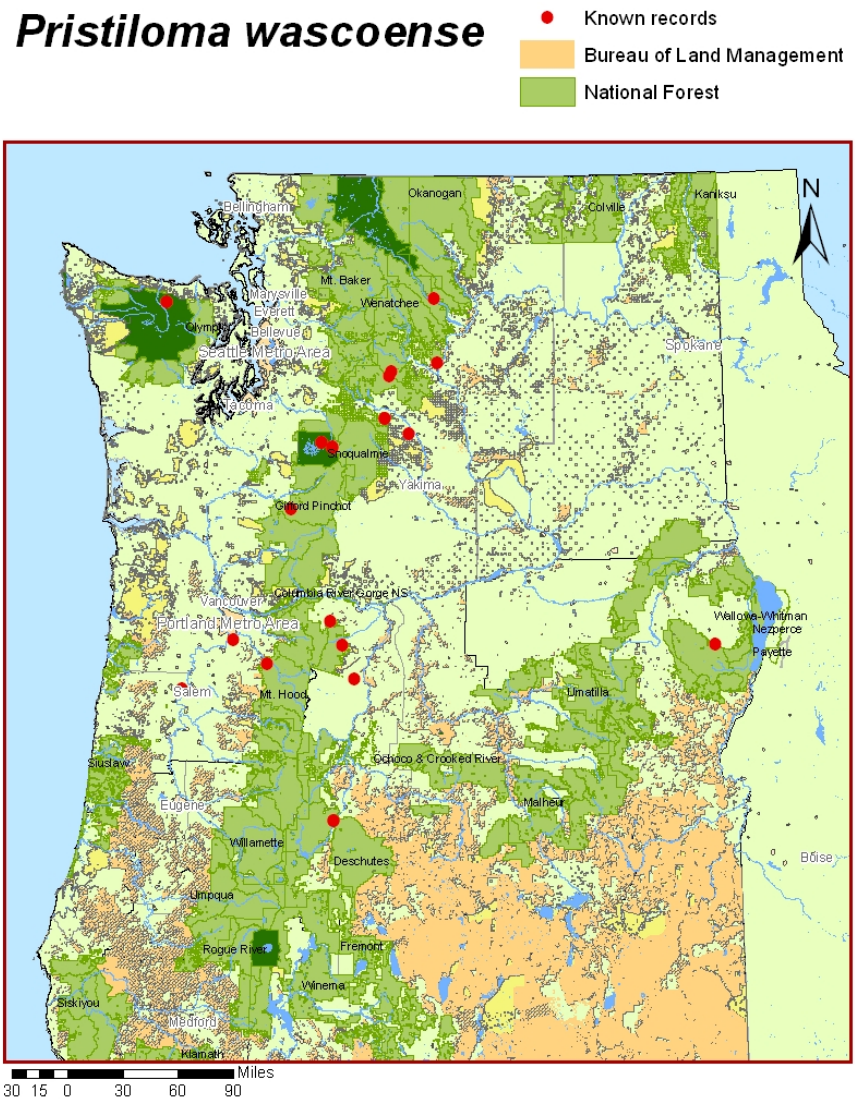
Threats

Activities such as livestock grazing, timbering activities, recreational activities, mining activities, heavy equipment operation, water diversions and improvements, and construction operations that compact soils or snow, disturb ground vegetation and/or litter, remove woody debris, alter temperature and/or humidity of the microsite, reduce canopy cover, or alter the water table could be deleterious to the habitat of *Pristiloma* species (Duncan 2004). While some level of exposure in the physical environment is tolerated by certain mollusks, most species are extremely sensitive to temperature and moisture extremes (Jordon and Black 2012).

Determination of Effects

Please refer to the general discussion of forest management effects to land snails under the fir pin wheel. The shiny tightcoil is listed as sensitive only in Washington and populations are probably largely buffered from management impacts due to the specific types of rocky terrain they occupy. Habitat for this species

appears to be aspen and/or riparian areas within the dry forest and cool/moist PVGs of the plan.The desired conditions of the plan are to manage plant composition and density at levels that approximate what is estimated to have occurred historically. None of the treatments envision removal of the forested canopy to the extent that desiccation of the habitat would occur. Use of prescribed fire is less than 8 percent in any one PVG under any alternative as well (see table 310 in the DEIS).



As indicated above, very little mechanical activity within old forest areas is anticipated due to management activities for any of the alternatives. As can be seen from Table 310 in the DEIS, over the first decade, less than 10 percent of each PVG is expected to receive mechanical treatment under the most aggressive alternative (Alt D) on the Umatilla National Forest. Furthermore, this species is only considered sensitive in Washington and more than 65 percent of the Washington portion of the Blue Mountains occurs within management areas that are not actively managed (i.e., wilderness or roadless areas). This would indicate that implementing of any alternative would still maintain much of the forest in potential “refugia” for this snail. Furthermore, even within those areas that are treated, important habitat attributes such as coarse woody debris need to be managed to achieve the desired conditions for that

attribute, meaning that it should occur across the landscape in space, time and patterns similar to what occurred historically.

This species is considered vulnerable both globally (G3) and nationally (N3) and is listed as possibly vulnerable (S3?) in Washington (NatureServe 2012).

Umatilla National Forest

According to the ISSSP the species is documented to occur on the Umatilla National Forest. Given the analysis above the magnitude of threats under any of the plan alternatives **may impact** individuals or habitat but **will not** contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Because:

1. More than 65 percent of the Washington portion of the Blue Mountains is in management areas that are not actively managed (i.e., wilderness or roadless areas).
2. It appears doubtful that this species occurs on the Washington portion of the Umatilla National Forest.
3. Further habitat evaluations will occur for any project proposal that may affect this habitat
4. Plan components under all alternatives provide adequate protection to ameliorate the identified risks to this species and its habitat.

Cumulative Effects on species

Because of the extremely limited mobility of terrestrial mollusks it is unlikely that cumulative effects would occur to any populations on forest service lands. It is uncertain what impacts climate change may have, but it would be safe to assume a reduction in habitats due to the predicted increase in temperature.

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