



United States Department of Agriculture
Forest Service

Waucoma

Huckleberry Enhancement

Wildlife Report

Prepared by:
Patty Walcott
East Zone Wildlife Biologist

Hood River Ranger District
Mt. Hood National Forest

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1.0 Introduction

This report addresses the wildlife species that may be found in the Waucoma project area. Seven species of wildlife, including critical habitat, are classified as threatened, endangered or proposed and may be found on or adjacent to the Hood River and Barlow Ranger Districts. There are eighteen U.S. Forest Service Region 6 Sensitive species, seven Survey and Manage species, and five Management Indicator species that may also be found on the Districts. The status of each species in the project area is listed in Table 1. Species that are not present or do not have habitat within the project area will not be discussed further in this report.

Table 1. Status of Species in the Project Area.

Species Category	Species	Habitat	Presence
Threatened, Endangered or Proposed (TEP)	Northern spotted owl (<i>Strix occidentalis caurina</i>)	yes	unknown
TEP	Northern spotted owl critical habitat	no	-
TEP	North American wolverine (<i>Gulo gulo luscus</i>)	no	-
TEP	Canada lynx (<i>Lynx canadensis</i>)	no	-
TEP	Gray wolf (<i>Canis lupis</i>)	yes	unknown
TEP	Oregon spotted frog (<i>Rana pretiosa</i>)	no	-
TEP	Oregon spotted frog critical habitat	no	-
R6 Sensitive	Bald eagle (<i>Haliaetus leucocephalus</i>)	no	-
R6 Sensitive	Peregrine falcon (<i>Falco peregrinus anatum</i>)	no	-
R6 Sensitive	Bufflehead (<i>Bucephala albeola</i>)	no	-
R6 Sensitive	Harlequin duck (<i>Histrionicus histrionicus</i>)	no	-
R6 Sensitive	White-headed woodpecker (<i>Picoides albolarvatus</i>)	no	-
R6 Sensitive	Lewis' woodpecker (<i>Melanerpes lewis</i>)	no	-
R6 Sensitive	Cope's giant salamander (<i>Dicmptodon copei</i>)	no	-
R6 Sensitive	Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)	no	-
R6 Sensitive	Fringed myotis (<i>Myotis thysanodes</i>)	no	-
R6 Sensitive	Western bumblebee (<i>Bombus occidentalis</i>)	yes	unknown
R6 Sensitive	Beller's ground beetle (<i>Agonum belleri</i>)	no	-
R6 Sensitive	Johnson's hairstreak (<i>Callophrys johnsoni</i>)	yes	unknown
R6 Sensitive	Mardon skipper (<i>Polites mardon</i>)	no	-
R6 Sensitive	Western pond turtle (<i>Actinemys marmorata</i>)	no	-
R6 Sensitive	Columbia sideband (<i>Monadenia fidelis Columbiana</i>)	no	-
R6 Sensitive	Crowned tightcoil (<i>Pristiloma pilsbryi</i>)	no	-
R6 Sensitive	Shiny tightcoil (<i>Pristiloma wascoense</i>)	no	-
R6 Sensitive	Sierra Nevada red fox (<i>Vulpes vulpes nectator</i>)	no	-
Survey & Manage	Great gray owl (<i>Strix nebulosa</i>)	no	-
Survey & Manage	Larch Mountain salamander (<i>Plethodon larselii</i>)*	no	-
Survey & Manage	Dalles sideband (<i>Monadenia fidelis minor</i>)*	yes	no
Survey & Manage	Crater Lake tightcoil (<i>Pristiloma arcticum crateris</i>)*	yes	no
Survey & Manage	Evening fieldslug (<i>Deroceras hesperium</i>)	no	-
Survey & Manage	Puget Oregonian (<i>Cryptomastix devia</i>)*	yes	no
Survey & Manage	Columbia Oregonian (<i>Cryptomastix hendersoni</i>)	yes	no
Management Indicator Species	Mule Deer (<i>Odocoileus hemionus</i>) and Elk (<i>Cervus elaphus nelsoni</i>)	yes	yes

Species Category	Species	Habitat	Presence
Management Indicator Species	Pileated Woodpecker (<i>Dryocopus pileatus</i>)	yes	yes
Management Indicator Species	American Marten (<i>Martes americana</i>)	yes	unknown
Management Indicator Species	Wild Turkey (<i>Meleagris gallopavo</i>)	no	-
Management Indicator Species	Western Gray Squirrel (<i>Sciurus griseus griseus</i>)	no	-
Other Required Analysis	Snags and Down Wood	yes	yes
Other Required Analysis	Neotropical Migratory Birds	yes	yes

*These species are now also considered a Region 6 Sensitive Species in addition to Survey and Manage.

2.0 Northern Spotted Owl

2.1 Analysis Assumptions and Methodology

2.1.1 Disturbance

The U.S. Fish and Wildlife Service (FWS) has concluded that noise, smoke, and human presence can result in a disruption of breeding, feeding or sheltering behavior of the northern spotted owl (spotted owl) such that it creates the potential for injury to individuals (i.e., incidental take in the form of harassment). For a significant disruption of spotted owl behavior to occur as a result of disturbance caused by the Proposed Action, the disturbance and spotted owl(s) must be in close proximity to one another. Human presence on-the-ground is not expected to cause a significant disruption of behavior because spotted owls do not seem to be startled in those situations.

A spotted owl that may be disturbed at a roost site is presumably capable of moving away from the disturbance without a substantial disruption of its behavior. Since spotted owls forage primarily at night, projects that occur during the day are not likely to disrupt its foraging behavior. The potential for effects is mainly associated with breeding behavior at active nest sites.

In the late breeding period, potential effects from disturbance decline because juvenile spotted owls are increasingly more capable of moving as the nesting season progresses. The critical breeding period is March 1 through July 15. After July 15, it is estimated that most fledgling spotted owls are capable of sustained flight and can move away from most harmful disturbances.

The FWS has based disruption distances on interpretation of the best available science. The Proposed Action for this project that generates noise above ambient levels would be the use of heavy equipment and chainsaws. The disruption distance is 65 yards for heavy equipment and chainsaws.

2.1.2 Home Range and Core Area

Since there are few recent surveys for spotted owls that show the locations of active nest sites on the Forest, historical spotted owl information is used. For the Willamette Province, the home range is a 1.2-mile radius circle (2,894 acres) centered on a nest site. A core area has been defined as the area within a home range that receives disproportionately high use (502 acres or 0.5-mile radius circle from the historic nest). There are four historic home ranges that overlap treatment units in the Waucoma planning area.

While it is usually the alteration or removal of suitable habitat (nesting, roosting, and foraging) that may result in adverse impacts to a territorial pair of spotted owls, the loss or degradation of dispersal habitat may also result in short-term impacts. The FWS has guidelines for how much removal of suitable habitat would result in take, but there are no such guidelines for dispersal habitat.

2.2 - Analysis for Northern Spotted Owl

2.2.1 - Existing Condition

2.2.1.1 – Habitat

Spotted owls generally rely on older forested habitats that contain the structures and characteristics required for nesting, roosting, foraging, and dispersal. These characteristics of older forests include a multi-layered, multi-species canopy dominated by large overstory trees; moderate to high canopy closure; a high incidence of trees with large cavities and other types of deformities; numerous large snags; an abundance of large, dead wood on the ground; and open space within and below the upper canopy for spotted owls to fly (Thomas et al. 1990). Forested stands with high canopy closure also provide thermal cover, as well as protection from predation.

Dispersal habitat for spotted owls usually consists of mid-seral stage stands between 40 and 80 years of age with a canopy closure of 40 percent or greater and an average diameter of 11-inches. Spotted owls use dispersal habitat to move between blocks of suitable habitat and juveniles use it to disperse from natal territories. Dispersal habitat may have roosting and foraging components, enabling spotted owls to survive, but lack structure suitable for nesting. Recent landscape-level analyses suggest that a mosaic of late-successional habitat interspersed with other vegetation types may benefit spotted owls more than large, homogeneous expanses of older forests (Zabel et al. 2003). There are 13,204 acres of dispersal habitat and 3,521 acres of suitable habitat in the 17,605-acre analysis area for spotted owls.

The composition of prey in the spotted owl's diet varies regionally, seasonally, annually, and locally, which is likely in response to prey availability (Forsman et al. 2001). Northern flying squirrels and woodrats are usually the predominant prey species. Other prey species include red tree vole, red backed voles, mice, rabbits and hares, birds, and insects.

2.2.1.2 - Management and Population Trends

Given the continued decline of the species, the apparent increase in severity of the threat from barred owls, and information indicating a recent loss of genetic diversity for the species, the Revised Recovery Plan recommends retaining more occupied spotted owl sites and unoccupied, high value spotted owl habitat on all lands. Vegetation management actions that may have short-term impacts but are potentially beneficial to occupied spotted owl sites in the long-term meet the goals of ecosystem conservation. Such actions may include silvicultural treatments that promote ecological restoration and are expected to reduce future losses of spotted owl habitat and improve overall forest ecosystem resilience to climate change, which should result in more habitat retained on the landscape for longer periods of time.

The Revised Recovery Plan identifies competition from the barred owl as an important threat to the spotted owl. Since barred owls are more aggressive and use the same habitats and prey as spotted owls, they are believed to be out competing spotted owls for habitat and food (USFWS 2011, Wiens 2012). Within the Oregon demographic study areas, there has been a steady increase in the number of barred owls as measured by the proportion of spotted owl sites with barred owls detected, with as many as 60 percent of the spotted owl sites having barred owls detected.

2.3 - Environmental Consequences Spotted Owl

2.3.1. – Analysis Area

The analysis area for spotted owl includes the project boundary and the five historic spotted owl territories that overlap and extend beyond the boundary.

2.3.2 – No Action

If no action were taken, then no acres would be treated and there would be no direct effects to spotted owls. The existing condition would be maintained with little change in the short-term. In the long-term, in the absence of major disturbance events, the stand densities and canopy cover would increase. Many of the stands currently providing dispersal habitat would grow into low quality suitable habitat in the next 75 to 100 years. After 200 or more years, these stands would function similar to a thinned stand but may have a greater number of snags and down wood.

2.3.3 - Direct and Indirect Effects of Proposed Action

2.3.3.1 - Effects from Disturbance

The proposed project is expected to have disturbance from vegetative treatments, road maintenance, road reconstruction, temporary road construction, and treatments to activity generated slash. Specifically, the disruption will be from chainsaws and other heavy equipment, smoke, and helicopter use. No spotted owls have been found in the planning area. If the historic nest sites are unoccupied, then there would be no effect from disturbance to spotted owls from

the proposed activities. Since there is a possibility of owls being present but undetected, the following affects determinations are based on assumed occupancy.

The project design criteria for treatments under the Proposed Action includes timing restrictions within the disturbance distance of a known spotted owl nest patch. All activities that require the use of heavy equipment or chainsaws that are between 65 yards and 0.25 miles from an owl nest patch between March 1 and July 15 may affect but are not likely to adversely affect spotted owl from disturbance. The project design criteria for helicopter use under the Proposed Action includes a timing restriction for no small helicopter use within 0.25 miles of a spotted owl nest patch, and no large helicopter use within 0.5 miles of a nest patch between March 1 and September 30, therefore, the use of helicopters may affect, but is not likely to adversely affect spotted owls due to disturbance.

2.3.3.2 - Effects from Habitat Modification

Treatment activities that remove dispersal habitat on 1,914 acres are not likely to adversely affect spotted owl. The analysis area currently has approximately 13,204 acres of dispersal only habitat. When combined with the amount of suitable that will also provide for dispersal (16,725 acres), 95 percent of the analysis area is currently providing dispersal habitat. This amount will be reduced by 1 percent, to 94 percent. Treatments would not prevent owls from being able to disperse within the analysis area and to adjacent habitat outside the analysis area.

2.3.3.3 - Effects to Prey Species

Studies have found that northern flying squirrels have generally responded negatively to thinning, although results have varied across studies. Several studies have suggested that forest thinning can temporarily (up to 20 years) reduce the availability of truffles, which are a key food resource for northern flying squirrels and other small mammals on which spotted owls depend (Waters et al. 1995). Because treatments in the Waucoma planning area are in dispersal spotted owl habitat, impacts to flying squirrels would be much less than if treatments were in suitable habitat. While they may be found in dispersal habitat, it is not their preferred habitat.

Mixed results have been reported in studies that examined effects of thinning on woodrats. Dusky-footed woodrats occur in a variety of conditions, including both old forests and younger seral stages, and are often associated with streams (Carey et al. 1992, 1999, Anthony et al. 2003). Research has suggested that thinning or associated practices (*e.g.*, burning slash piles) could be detrimental to dusky-footed woodrats if it reduces hardwoods, shrubs or downed wood, yet treatments could ultimately benefit woodrats if they result in growth of shrubs or hardwoods. The proposed treatments would not reduce the amount of hardwoods and would result in the growth of shrubs which could benefit woodrats.

Species such as brush rabbits and other rodents are primarily associated with early-and mid-seral forest habitats (stands < 80 years of age) and could benefit from increased understory and shrub development (Carey 2001, Carey and Wilson 2001).

2.3.3.4 - Barred Owl Competition

Across their range, barred owls are known to use a wide variety of forest types and it has been suggested they are habitat generalists that may benefit from timber harvest activities such as clearcutting and thinning (Hamer et al. 1989, Iverson 1993). However, a detailed review for the spotted owl recovery plan found much evidence that barred owls prefer old-growth and older forest habitat in the Pacific Northwest (USFWS 2011). While a suggestion has been made that timber harvest activities may favor barred owls, an alternative hypothesis is that barred owls have a wider range of habitat use in the northern part of the spotted owl's range, and the spotted owl has a narrower one. But in the more southerly part of the spotted owl's range, the spotted owl seems to have a broader range of habitat use than does the barred owl (Courtney et al 2004). Therefore, timber harvest may have the effect of leading to a competitive advantage for barred owls in some areas, but not in others (Courtney et al 2004, Dugger et al. 2011). The Waucoma planning area is in the middle of the range for spotted owl so the above studies may indicate a balance between an advantage for barred owls and an advantage for spotted owls.

Because barred owls can prey on a wider range of species than spotted owls, there has been speculation that thinning may increase prey favored by barred owls. The Young Stand Study on the Willamette National Forest found that commercial thinning of mid-seral stands will significantly increase the abundance of deer mice and Townsends chipmunks (McComb et al 2013). Wiens (2012) found that these two species comprised about 5 percent of the prey biomass for spotted owls compared to 3 percent for barred owls in an area of western Oregon. Therefore, the small mammal species that would increase most after thinning under the Proposed Action are not ones that are selectively favored by barred owls more than spotted.

2.3.4 - Cumulative Effects

Past timber harvest on the Mt. Hood National Forest and adjacent lands under other ownership was considered in this cumulative effects' analysis for projects in the past, present, and foreseeable future that overlap the analysis area in time and space.

Past timber harvest on federal and private land have reduced the amount of suitable habitat on the landscape and this habitat loss will remain on the landscape into the future. Private lands are not expected to provide suitable habitat in the long-term as they are not managed for spotted owl. The proposed project would not further reduce the amount of suitable on the landscape since no suitable habitat would be treated.

The cumulative effects to dispersal habitat would not prevent spotted owls from foraging or dispersing throughout the analysis area. The private land to the south and east is not providing for dispersal of spotted owl. Owls would continue to be able to disperse north and west across the Forest.

2.4 - Consistency with Management Direction

2.4.1 - Recovery Actions 10 and 32

The proposed project is consistent with the Northwest Forest Plan and with the Revised Northern Spotted Owl Recovery Plan (USFWS 2011).

- *Recovery Action 10*: Conserve spotted owl sites and high value spotted owl habitat to provide additional demographic support to the spotted owl populations.
 - The proposed project maintains the highest quality habitat within the planning area and there are no treatments in suitable habitat.
- *Recovery Action 32*: Because spotted owl recovery requires well distributed, older and more structurally complex multi-layered conifer forests on Federal and non-federal lands across its range, land managers should work with the Service to maintain and restore such habitat while allowing for other threats, such as fire and insects, to be addressed by restoration management actions. These high-quality spotted owl habitat stands are characterized as having large diameter trees, high amounts of canopy cover, and decadence components such as broken-topped live trees, mistletoe, cavities, large snags, and fallen trees.
 - The proposed project would maintain suitable habitat. High-quality stands would be retained with suitable and dispersal habitat between these stands for habitat connectivity.

2.4.2 – Forest Plan Standards and Guidelines

The Proposed Action is consistent with the following Standards and Guidelines:

FW -170, 171: The Forest shall cooperate with implementation of interagency species recovery efforts for threatened and endangered species.

FW – 174: Threatened, endangered and sensitive plants and animals shall be identified and managed in accordance with the Endangered Species Act.

FW – 175: Habitat for threatened, endangered and sensitive plants and animals shall be protected and/or improved.

FW – 176: Biological Evaluations shall be prepared for all Forest Service planned, funded, executed, or permitted programs and activities for possible effects on endangered, threatened or sensitive species.

2.5 - Summary of Effects

The proposed action would reduce the amount of dispersal habitat by 1,914 acres which equates to 1 percent of the analysis area and is not likely to adversely affect northern spotted owl. Because of timing restriction project design criteria (PDC), the proposed action is not likely to adversely affect northern spotted owl due to disturbance from project operations. The proposed action is consistent with the Revised Recovery Plan for Northern Spotted Owl and all relevant Mt. Hood Land and Resource Management Standards and Guidelines.

2.6 - Other Agencies and Individuals Consulted

The proposed action was consulted on under the informal programmatic: Routine Land Management Activities within the Willamette Planning Province of Oregon with a Potential to Modify Habitat, which are not Likely to Adversely Affect Federally Listed Species (USFWS 2018, Ref # 01EOFW00-2017-I-0667).

3.0 – Gray Wolf

3.1 Analysis Assumptions and Methodology

A review of scientific literature, relevant to Forest Service managed lands, was conducted in order to make sound decisions about the potential impacts to wolves from management activities. Recommendations to reduce impacts to wolves were made based on meetings and communications with subject matter experts from partnering agencies (WDFW, ODFW, and FWS) who have experience with monitoring and managing wolf populations in northeast Oregon (USFS 2015).

The authors of this draft paper examined the best available information to evaluate the impacts of forest management on gray wolf range and population expansion on the Umatilla Forest. (USFS 2015) Because the management activities on both Forests are similar, it is assumed that this information would also apply to wolves that may occur on the Mt. Hood National Forest. This evaluation concluded that activities that took place outside of 1 mile from a den or rendezvous site would have no effect on gray wolf from disturbance.

3.2 - Analysis of the Proposed Action for Gray Wolf

3.2.1 - Existing Condition

Gray wolves (*Canis lupus*) were reintroduced in the mid-1990s in central Idaho and Yellowstone National Park and then dispersed naturally into Oregon. In 2008 the first wolf pack was confirmed in Oregon on the Umatilla National Forest by Oregon Department of Fish and Wildlife (ODFW) biologists. In May 2001, the FWS delisted wolves in Idaho, Montana, parts of Oregon, Washington, and Utah. In December 2015 the ODFW removed the gray wolf from its endangered species list because the wolf had met the state's population criteria for delisting. Wolves in Oregon west of Hwy 395 remain protected by the federal Endangered Species Act.

The FWS is the lead management agency for wolves west of Hwy 395, including those that may be on the Forest. Since establishment was documented in 2008, Oregon's wolves expanded rapidly and in 2018 resident wolves occur within almost 19,000 square kilometers of the state. Most wolves occur in northeastern Oregon, and four areas of known wolf activity now occur in the western part of the state.

Gray wolves are considered habitat generalists. Wolves in Oregon primarily use forested habitat with seasonal shifts to more open habitats that reflect seasonal distributions of prey (ODFW 2019).

3.3 - Proposed Action Environmental Consequences Gray Wolf

3.3.1 – Analysis Area

The analysis area for gray wolves includes the planning area boundary and a one-mile buffer.

3.3.2 – No Action

If no action were taken, then no acres would be treated and there would be no direct effects to gray wolves from disturbance. The existing condition would be maintained with little change to forest structure and composition and there would be no increase in forage for deer and elk.

3.3.3 - Direct and Indirect Effects of Proposed Action

No dens or rendezvous sites have been detected on the Forest or within the project area. Project related activities would increase human presence during implementation and this may cause wolves to temporarily avoid the area.

Thinning activities would increase forage for deer and elk which are the primary prey species of gray wolves. While the proposed action may cause wolves to temporarily avoid the area during project implementation, project design criteria would limit disturbance within one mile of a den or rendezvous site. In addition, the proposed action could indirectly benefit the gray wolf by increasing the availability of prey within the planning area, therefore, the proposed action may affect, but is not likely to adversely affect gray wolf.

3.3.4 – Cumulative Effects

The following list of projects in the past, present, and foreseeable future overlap the analysis area in time and space and were considered in this cumulative effects' analysis: timber harvest on federal lands, road decommissioning and road closures, pre-commercial thinning, and recreational use.

The cumulative effects are similar to the effects of the Proposed Action and would have a combination of positive and temporary negative impacts on gray wolf. Open habitat that would be created from timber harvest, pre-commercial thinning, and plantation thinning would increase the availability of prey within the analysis area. Road closures and decommissioning

would benefit wolves by decreasing the amount of human disturbance. The increased human presence from human activities may cause wolves to temporarily avoid the area during implementation of projects and heavy recreational use may cause wolves to avoid areas altogether. Therefore, the cumulative effects are largely beneficial and this species would persist in the analysis area.

3.4 - Consistency with Management Direction

The Proposed Action is consistent with the following Land and Resource Management Plan Standards and Guidelines:

FW -170, 171: The Forest shall cooperate with implementation of interagency species recovery efforts for threatened and endangered species.

FW – 174: Threatened, endangered and sensitive plants and animals shall be identified and managed in accordance with the Endangered Species Act.

FW – 175: Habitat for threatened, endangered and sensitive plants and animals shall be protected and/or improved.

FW – 176: Biological Evaluations shall be prepared for all Forest Service planned, funded, executed, or permitted programs and activities for possible effects on endangered, threatened or sensitive species.

3.5 - Other Agencies and Individuals Consulted

The proposed action was consulted on under the informal programmatic: Routine Land Management Activities within the Willamette Planning Province of Oregon with a Potential to Modify Habitat, which are not Likely to adversely Affect Federally Listed Species (USFWS 2018, Ref # 01E0FW00-2017-I-0667).

4.0 – Western Bumblebee

4.1 Analysis Assumptions and Methodology

All Region 6 sensitive species within the project area must be analyzed, as required by the Forest Plan. Sensitive species with suitable habitat within the project area include the western bumblebee and Johnson's hair-streak. Information on these species from the Interagency Special Status / Sensitive Species Program as well as other research was reviewed and summarized to determine how these species use the project area and the impacts that this project would have on these species.

4.2 - Analysis of the Proposed Action for Western Bumblebee

4.2.1 - Existing Condition

4.2.1.1 Life History

The western bumblebee was widespread and common throughout the western United States and western Canada before 1998 (Xerces Society 2009). Since 1998, populations of this bumblebee have declined drastically throughout parts of its former range. In Alaska, east of the Cascades and in the Canadian and U.S. Rocky Mountains, viable populations still exist. Populations of the western bumblebee in central California, Oregon, Washington and southern British Columbia have mostly disappeared. It is difficult to accurately assess the magnitude of these declines since most of this bee's historic range has not been sampled systematically.

According to Goulsen (2003a), bumblebee colonies are annual. In the late winter or early spring, the queen emerges from hibernation and then selects a nest site, which is often a pre-existing hole, such as an abandoned rodent hole. She then supplies the nest with pollen as well as nectar.

Bumblebees visit a range of different plant species and are important generalist pollinators of a wide variety of flowering plants and crops (Goulsen 2003a;). Although bumblebees do not depend on a single type of flower, some plants rely solely on bumblebees for pollination. In addition, native bees, such as bumblebees are adapted to local conditions (Goulsen 2003b).

4.2.1.2 – Threats

There are several threats which face bumblebees and are leading to their decline. The following threats and conservation considerations are from a status review, co-authored by Robbin Thorp, Elaine Evans, and Scott Hoffman (Thorp et al. 2008). Agriculture and urban development alter landscapes and habitat required by bumblebees while grazing livestock poses a threat since the animals remove flowering food sources, disturb nest sites and alter the vegetation community. Foraging bumble bees are directly threatened by insecticide applications when used in agricultural settings. Massive bumble bee kills have occurred as a result of insecticide application on Forest Service managed public lands intended for the control of spruce budworm. Bumble bees can be indirectly harmed when the flowers that they normally use for foraging are removed by the application of broad-spectrum herbicides. When exotic plants invade and dominate native grasslands, they may threaten bumble bees by competing with the native nectar and pollen plants relied upon by bumble bees.

4.2.1.3 Surveys on the Forest

Surveys for Western bumblebees were conducted by the Xerces Society on the Forest in 2013 and by Forest Service biologists in 2015. A total of 34 locations were surveyed in 2013 and Western bumble bees were located at 8 of these locations. In 2015, 24 locations were surveyed, and bumble bees were detected at 8 locations, 6 of which were previously unreported locations

for this species. In 2016, 23 locations were surveyed, and Western bumblebees were documented at 6 of these sites. Five of the six sites were new locations for this species. None of the detections were near the Waucoma planning area but suitable habitat does exist in the higher elevations.

4.3 - Proposed Action Environmental Consequences Western Bumblebee

4.3.1 – Analysis Area

The analysis area for Western bumble includes the Waucoma project area boundary.

4.3.2 – No Action

If no action were taken, then no acres would be treated and there would be no direct effects to western bumblebees. Flowering plants and nest sites would not be temporarily impacted. The existing condition would be mainlined with little change in the short-term. In the long-term with no major disturbance event, there would be no beneficial effect to bumblebees because there would be no increase in foraging plants.

4.3.3 - Direct and Indirect Effects of Proposed Action

The proposed action may temporarily impact flowering plants during road maintenance, road reconstruction, and timber harvest activities. Reducing this food source would reduce the ability of foraging bees to find nectar at these sites which is a required food source for young bees. It is expected that these shrubs would regenerate within a few years and that the bumblebees would have other nectar plants available within the untreated open portions of the project area.

The proposed action may temporarily impact nest sites if these nests are located within abandoned bird nests or other structures above ground. Tree harvest and road maintenance and reconstruction activities could reduce the number of nests available in the short-term and therefore reduce the number of bumblebees that this area could support. Nest sites would increase within a few years after treatment. The temporary reduction in flowering shrubs and nesting sites may impact individuals but will not likely contribute to a trend towards federal listing or cause a loss of viability of the population or species.

Because bumblebees can forage for nectar on a variety of flowering plants, the untreated portions of the planning area would continue to provide a food source. These untreated portions of the watershed would also continue to provide for nesting and hibernating habitat. The adjacent untreated areas would allow for bumblebees to recolonize the impacted acres within the treatment area as foraging and nesting habitat return.

While the number of bees in the project area may be slightly reduced, this reduction would be temporary as flowering shrubs and nest sites increase within a few years after treatments. In the long-term, the proposed action would benefit Western bumblebees since the enhancement of huckleberry plants on 2,592 acres would provide additional foraging for this species.

4.3.4 – Cumulative Effects

The following list of projects in the past, present, and foreseeable future overlap the analysis area in time and space and were considered in this cumulative effects' analysis: road decommissioning, road closures, pre-commercial thinning, noxious weed treatments, and maintenance of Farmer's Irrigation District infrastructure.

The projects listed above may increase or improve foraging habitat in the long-term. While weed treatments may benefit bumblebees by improving habitat for native flowering plants, bees can be indirectly harmed when the flowers that they normally use for foraging are removed by the application of broad-spectrum herbicides.

While the projects analyzed under cumulative effects may have impacts to individual bumble bees, the main threats to this species are agriculture and urban development, livestock grazing, and broad scale insecticide application (Thorp et al. 2008). These kinds of activities are not included in the proposed action, but livestock grazing is considered a cumulative impact. Because some of the proposed activities increase or improve habitat while others may decrease it, the impacts would likely be beneficial and detrimental at the same time. Therefore, the cumulative effects are neutral, and populations of this species would persist in the analysis area.

4.4 - Consistency with Management Direction

The proposed action is consistent with the following Standards and Guidelines for sensitive species: FW-174: Threatened, endangered and sensitive plants and animals shall be identified and managed in accordance with the Endangered Species Act (1973), the Oregon Endangered Species Act (1987), and FSM 2670; and, FW-175: habitat for threatened, endangered and sensitive plants and animals shall be protected or improved.

5.0 – Johnson's Hairstreak

5.1 Analysis Assumptions and Methodology

All Region 6 sensitive species within the project area must be analyzed, as required by the Forest Plan. Sensitive species with suitable habitat within the project area includes the western bumblebee and Johnson's hair-streak. Information on these species from the Interagency Special Status / Sensitive Species Program as well as other research was reviewed and summarized to determine how these species use the project area and the impacts that this project would have on these species.

5.2 - Analysis of the Proposed Action for Johnson's Hairstreak

5.2.1 - Existing Condition

5.2.1.1 – Habitat

Johnson's hairstreak occurs 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). Larsen et al. (1995) states that 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. All sightings in both Washington and Oregon have been in coniferous forests. Ecoregions where this species occurs in Oregon, as determined by the Oregon Biodiversity Information Center include the Ochoco, Blue and Willowa Mountains, Coast Range, East Cascades, Klamath Mountains, West Cascades and the Willamette Valley.

5.2.1.2 – Life History

Larvae can be found feeding on dwarf mistletoe (Opler and Wright 1999). Caterpillars feed on all exposed plant parts and secrete a sugary solution which is used by ants that in turn protect the caterpillar from predators. Caterpillars can be found on host leaves April-October (Allen et al. 2005). Nectar of flowers in several families from numerous genera including *Actostophylos*, *Ceanothus*, *Cornus*, dandelion, *Fragaria*, *Rorippa* and *Spraguea* is consumed by adult butterflies who obtain additional moisture by visiting mud puddles (Shields 1965). In California, males have been observed awaiting females by perching atop treetops or hilltops (Scott 1986). Adults fly from mid-May to early September with peaks occurring in May and August (Pyle 2002). In the northern part of the range, and at high altitudes, one flight occurs from late May- mid July (Scott 1986). The Johnson's hairstreak is considered to be the only obligate old-growth butterfly (Pyle 2002). Due to their habitat associations and tendency to reside in the forest canopy, these butterflies are not often encountered.

5.2.1.3 – Threats

The main threats to this species are the reduction of old-growth, insecticide use, and application of herbicides to flowering plants that are nectar sources. The application of BTK (*Bacillus thuringiensis* Berliner var. *kurstaki*), used for spruce budworm suppression, is also hazardous to populations of the Johnson's hairstreak.

5.3 - Proposed Action Environmental Consequences Johnson's Hairstreak

5.3.1 – Analysis Area

The analysis area for Johnson's hairstreak includes the Waucoma project area boundary.

5.3.2 – No Action

Under the No Action Alternative, Johnson's hairstreak mistletoe habitat and flowering food source would not be impacted and, therefore, there would be no impact to the butterfly.

5.3.3 - Direct and Indirect Effects of Proposed Action

The proposed action could impact the larval stage of Johnson's hairstreak by removing large trees with mistletoe. Trees with mistletoe would not be directly targeted by this project and would continue to be present throughout the planning area. Mature forest structure would also remain within treated and adjacent untreated stands.

The proposed project may temporarily impact flowering plants during road maintenance, road reconstruction, and timber harvest activities. Reducing this food source would reduce the ability of foraging butterflies to find nectar at these sites. These flowers and shrubs would regenerate within a few years and the butterflies would have other nectar plants available within the project area.

While the number of Johnson's hairstreak in the project area may be slightly reduced, this reduction would be temporary as flowering shrubs increase within a few years after treatments. Because these butterflies can forage for nectar on a variety of flowering plants, the untreated portions of the planning area would continue to provide a food source. These untreated portions of the planning area and many of the treated stands would continue to provide mistletoe for caterpillar habitat. The proposed action 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.

5.3.4 – Cumulative Effects

The following list of projects in the past, present, and foreseeable future overlap the analysis area in time and space and were considered in this cumulative effects' analysis: road decommissioning, road closures, pre-commercial thinning, noxious weed treatments, and maintenance of Farmer's Irrigation District infrastructure.

The projects listed above may increase or improve foraging habitat in the long-term. While weed treatments may benefit butterflies by improving habitat for native flowering plants, butterflies can be indirectly harmed when the flowers that they normally use for foraging are removed by the application of herbicides. The beneficial impact of habitat improved for Johnson's hairstreak under this cumulative effects' analysis would far outweigh the negative impacts from herbicide application and therefore there is a beneficial cumulative effect.

5.4 - Consistency with Management Direction

Through project design and the use of design criteria, the proposed action is consistent with the following Standards and Guidelines for sensitive species: FW-174: Threatened, endangered and

sensitive plants and animals shall be identified and managed in accordance with the Endangered Species Act (1973), the Oregon Endangered Species Act (1987), and FSM 2670; and, FW-175: habitat for threatened, endangered and sensitive plants and animals shall be protected or improved.

6.0 – Mule Deer and Elk

6.1 Analysis Assumptions and Methodology

The National Forest Management Act requires the Forest Service to manage wildlife habitat to “maintain viable populations of existing native and desired non-native vertebrate species in the planning area.” The National Forest Management Act requires the Forest Service to identify Management Indicator Species through the planning process, and to establish objectives to maintain and improve the habitat of indicator species. The primary assumption of this process is that indicator species represent the habitat needs of other species because they have similar habitat requirements. Spotted owls, for example, indicate the needs of a variety of animals that use old growth forest. This analysis focuses on certain key species and does not specifically address common species except to the extent that they are represented by these management indicator species. Management Indicator Species for this portion of the Forest within the project area include northern spotted owl (see section 2.0 of this report), mule deer (deer) and elk, pileated woodpecker, and American marten. (Table 1)

6.2 - Analysis of the Proposed Action for Deer and Elk

6.2.1 - Existing Condition

The project area supports elk and deer for most of the year. Elk cows and calves are in the western portion and higher elevations of the watershed from early spring through late fall. Black-tailed deer are common and relatively abundant in the spring, summer, and fall within the planning area. The south eastern portion of the analysis area is identified in the Mt. Hood LRMP as inventoried winter range, some of which is in the B10 Land Use Allocation. Deer and elk spend the winter there depending on snow accumulation. Deer are less likely to be there during periods of heavy snowfall as they are less able to move through deep snow. Forage is available in the planning area but is generally of low quality due to the lack of un-forested areas.

Elk herds within the project area likely exhibit a close association with riparian habitat in areas of gentle terrain and low open road density. Research on elk in this kind of habitat generally shows that elk spend most of their time in close proximity to a stream or wetland. Low quality forage, lack of wetlands and permanent low-gradient streams are considered one of the limiting factors for elk and possibly deer in the planning area.

Thermal cover for elk is defined as a stand of coniferous trees at least 40-feet tall with an average crown closure of 70 percent or more. Optimal cover is found mainly in multi-storied mature and old-growth stands. The stands in the planning area provide both thermal and optimal cover.

During the 1980s and 1990s, wildlife managers considered thermal cover to be important to deer and elk survival and production. Over time, wildlife managers have questioned if elk required thermal cover. Telemetry data presented at the Elk Modeling Workshop (April 2010) indicated that elk were negatively associated with cover and that openings are far more valuable for elk than cover.

With the reduction in regeneration timber harvest, the Forest now has abundant optimal and thermal cover, but openings for forage are becoming scarce. There are approximately 69,226 acres of early-seral habitat on the Forest. This level is declining over time at mid and lower elevations since plantations have grown dense with trees that shade out forage.

High road densities lead to harassment of elk herds. Harassed elk move more often than elk left alone and use of habitat decreases as road density increases (Witmer 1985). It is also recognized that elk within or moving through areas of high open-road densities move longer distances; often several miles per day.

6.3 - Proposed Action Environmental Consequences Deer and Elk

6.3.1 – Analysis Area

The analysis area for deer and elk includes the West Fork Hood River Watershed.

6.3.2 – No Action

If no action were taken, then no acres would be treated and there would be no direct effects to deer and elk from disturbance causing activities. In the absence of a major disturbance, no thermal cover would be removed and there would be no benefit to deer and elk since no forage would be created.

6.3.3 - Direct and Indirect Effects of Proposed Action

6.3.3.1 – Thermal Cover

The proposed treatments would remove thermal cover in stands when canopy cover is reduced to below 50%. While there would be a loss of thermal cover in treated stands, there would be an increase in forage within these same stands. Because thermal cover is no longer considered a vital component of deer and elk habitat, and because cover would still be provided in untreated stands, deer and elk would benefit from huckleberry treatments because of the increase in forage.

6.3.3.2 - Disturbance

Timber removal, road maintenance, and sale area preparation activities could potentially disturb animals in the area at the time of implementation. Disturbance could temporarily displace animals and may potentially affect the health of individuals if the disturbance occurs near active calving or wintering sites. Project activities would not all be occurring at the same

time, but in a few places at any one time. The potential disturbance would be small in scale, temporary in nature and only impact a few individuals at any given time. The project is not expected to cause a measurable reduction or increase in the current local population size for either deer or elk.

New temporary road construction and old existing temporary roads would be reopened and reconstructed to access units. These roads would not be open to the public and the only disturbance would be from activities required to open the road and to accomplish proposed treatments in the project area. The roads that would need to be opened would be closed after treatments. There would be no increase in the long-term harassment of deer and elk with this alternative. While there is some B10 Land Use Allocation in the analysis area, no activities are proposed in this area.

6.3.3.3 – Road Densities

The overall open road density within the project area is currently 2.27 miles of road per square mile. The current open road density in summer range (lands not in B10 Land Use Allocation or inventoried winter range) is 2.33, which is below the 2.5 miles per square mile for the Forest Plan Standard in inventoried summer range. The open road density within inventoried deer and elk winter range is currently 1.73 miles of road per square mile, which is below the 2.0 miles per square mile standard for inventoried winter range under the Forest Plan. There are also 0.91 miles of open roads per square mile within B10 winter range which is below the Forest Plan Standard of 1.5 miles per square mile between December 1 and April 1.

The proposed action would reduce the open road density for the project area to 1.69 and would reduce the open road density in summer range to 1.60 miles of open roads per square mile which is below the Forest Plan Standard of 2.50 miles per square mile. Open road densities in winter range would remain unchanged from the current level of 0.91 miles per square mile. The reduction in open road densities would benefit deer and elk by reducing the disturbance from human presence.

6.3.4 – Cumulative Effects

The following list of projects in the past, present, and foreseeable future overlap the analysis area in time and space and were considered in this cumulative effects' analysis: road decommissioning, road closures, recreational use, pre-commercial thinning, and timber harvest on Forest and private lands.

It is assumed that at least 50 percent of the private land would not provide thermal cover at any given time. However, cover is not considered a limiting factor for deer and elk in the analysis area because much of the Forest's lands are providing cover and very little forage opportunities. The optimum cover forage ratio is 60 percent forage and 40 percent cover (Thomas, 1979). Forage availability is more of a limiting factor on the Forest but is more available off-Forest as a result of regeneration harvest on private lands. Cumulatively, there would be a small increase in

forage and a small decrease in cover which would move the forage to cover ratio towards the optimum ratio which would be a beneficial cumulative impact.

Human presence from recreation may cause both deer and elk to avoid more heavily used areas. Deer are expected to be more tolerant of recreation, while elk are less tolerant, and may move out of areas at certain times of the year. Cumulatively, recreational activities would impact deer and elk by reducing the amount of security habitat available, which could in turn, reduce the number of deer and elk that the analysis area could support. Because the cumulative impacts of recreation are detrimental and the increase in forage are beneficial, the overall cumulative impacts would be neutral.

6.4 - Consistency with Management Direction

This project is consistent with The National Forest Management Act which requires the Forest Service to manage wildlife habitat to “maintain viable populations of existing native and desired non-native vertebrate species in the planning area.”

Open road densities under the proposed action would be reduced. The Forest Plan Standard of 2.5 miles per square mile of open roads for inventoried summer range (FW-208) would be met. The Forest Plan Standard for open road densities within B10 and inventoried winter range would continue meeting the Forest Plan Standard of 1.5 (B10) and 2.0 (inventoried winter range) miles per square mile.

7.0 – Pileated Woodpecker

7.1 Analysis Assumptions and Methodology

See section 6.1 Analysis Assumptions and Methodology

7.2 - Analysis of the Proposed Action for Pileated Woodpecker

7.2.1 - Existing Condition

The pileated woodpecker was chosen as a management indicator species because of its need for large snags, large amounts of down woody material, and large defective trees for nesting, roosting and foraging. Pileated woodpeckers use mature and older, closed canopy stands (>60% canopy cover) for nesting and roosting but may use younger (40 to 70 years), closed-canopy stands for foraging if large snags are available. Large snags and decadent trees are important habitat components for pileated woodpeckers (Hartwig et al. 2004, Mellen et al. 1992).

The association with late seral stages comes from the need for large-diameter snags or living trees with decay for nest and roost sites, large-diameter trees and logs for foraging on ants and other arthropods, and a dense canopy to provide cover from predators. Nest cavities average 8 inches in diameter and 22 inches in depth and are excavated at an average height of 50 feet above the ground, therefore nest trees must have a large diameter in order to contain nest

cavities. Because ants are the main diet for pileated woodpeckers, large diameter snags and logs with some decay are selected for foraging because carpenter ants inhabit these sites. Nest excavation occurs from late March to early May, incubation from May to early June, and fledging in early July. Both birds excavate, incubate, and rear young.

The mean home range for pileated woodpeckers is 1,181 acres with approximately a 9-30 percent overlap (about 200 acres) between territories. Therefore, an average home range with overlap for pileated woodpeckers would be approximately 970 acres (Mellen et al. 1992).

From 2014 to 2016, forest stands that meet this metric have increased steadily from 592,470 acres to 596,780 acres. Overall, this metric has been steadily increasing since the 1990 Forest Plan was written (543,240 acres in 1990). Range-wide within Canada and the United States, the pileated woodpecker population has steadily increased from 1966 to 2015, according to the North American Breeding Bird Survey (Sauer et al., 2017). The trend for the pileated woodpecker is increasing at the forest and range-wide scale.

By dividing the acres of pileated woodpecker habitat by the average home range with overlap of 970 acres there are 615 potential home ranges on the Mt Hood National Forest. With an average of four eggs laid by each pair (Marshall, D.B. et al. 2003), this would indicate that the summer population of pileated woodpeckers could be as high as 2,500 birds including adults and fledglings. Given the amount of habitat available, there may be up to 5 home ranges in the project area when considering unmanaged stands as habitat.

7.3 - Proposed Action Environmental Consequences Pileated Woodpecker

7.3.1 – Analysis Area

The analysis area for the pileated woodpecker includes the area within the project boundary. The Northwest Forest Plan directs the B5 pileated woodpecker/American marten areas to return to their underlying land allocation in Matrix lands except where needed to assure habitat and dispersal for the guilds of species represented by the pileated woodpecker and marten. The Forest assessed the relative importance of individual B5 areas in contributing to late seral forest conditions at the watershed landscape level. Based on that assessment, the Forest recommended that certain B5 areas be returned to the underlying land allocation and that individual watershed analysis take a closer look at the remaining B5 areas.

The West Fork Hood River Watershed Analysis looked at all individual B5 areas again to validate the results of the Forest level analysis and to make a recommendation on which areas to retain. The Forest did not find a need to retain any B5 areas set aside for pileated woodpeckers within the project boundary, except for 13 acres in the southwest portion of the planning area. There are no treatments proposed in B5.

7.3.2 – No Action

If no action were taken, then no acres would be treated and there would be no direct effects to pileated woodpeckers. The existing condition would be maintained with little change in the

short-term. In the long-term, in the absence of major disturbance events, the stand densities and canopy cover would increase. In 30 to 60 years, the stands would start to differentiate to varying degrees and there would be an increase in levels of small snags and small down wood.

7.3.3 - Direct and Indirect Effects of Proposed Action

Sapling stands do not provide habitat for this species, therefore there would be no direct impacts from sapling treatments. In the long-term, habitat for pileated woodpecker would be improved in these stands because larger trees would be recruited onto the landscape more quickly in thinned stands.

Timber harvest has the most significant effect on habitat for the pileated woodpecker. Removal of large-diameter live and dead trees, down woody material, and canopy reductions limits nest and roost sites, foraging habitat, and protective cover. Forest fragmentation likely reduces population density and makes birds more vulnerable to predation as they fly between forest fragments. Treatments that reduce the canopy cover may reduce the ability of an area to support, roosting, and foraging for this species (Marshall, D.B. et al. 2003). Treatments are not proposed in areas that are considered suitable nesting habitat for pileated woodpeckers.

The number of large diameter snags and down logs that are currently in treatment units would not be impacted since snags and down logs would be maintained according to Forest Plan Standards and Guidelines. Snags would only be felled for safety reasons.

7.3.4 – Cumulative Effects

Past timber harvest on the Mt. Hood National Forest and adjacent lands under other ownership was considered in this cumulative effects' analysis for projects in the past, present, and foreseeable future that overlap the analysis area in time and space.

Past timber harvest on federal lands has reduced the amount of habitat in the analysis area. Habitat for this species has continued to increase over time across the Forest but the analysis area would provide less habitat than other areas of the Forest. The current trend for pileated woodpeckers is increasing at the Forest and range-wide scale, therefore the cumulative impacts would be minimal.

7.4 - Consistency with Management Direction

The proposed action is consistent with The National Forest Management Act which requires the Forest Service to manage wildlife habitat to “maintain viable populations of existing native and desired non-native vertebrate species in the planning area.”

8.0 – American Marten

8.1 Analysis Assumptions and Methodology

See section 6.1 Analysis Assumptions and Methodology.

8.2 - Analysis of the Proposed Action for American Marten

8.2.1 - Existing Condition

In the western United States, the American marten's distribution is fragmented. Home ranges vary from 1 to 4.5 square miles for males and from 0.4 to 3.6 square miles for females (Simon 1980, Zielinski et al. 1997). Martens prey on vertebrates smaller and larger than themselves, eat carrion, and forage for bird eggs, insects, and berries (Martin 1994).

American martens are closely associated with forested habitats with complex physical structure near the ground. Structure can include the lower branches of living trees, tree boles in various stages of decomposition, coarse woody debris, shrubs, and rock fields. Martens show a preference for forest canopy cover of > 50%. Use of non-forested habitats by martens increases in summer and includes meadows and small harvest units near forest edges, as well as areas above the tree line in western mountains (Buskirk and Ruggiero 1994).

Activities such as timber harvest and road construction that fragment, dissect, and isolate habitats are the largest threats to marten. Fragmented habitats attract habitat generalist predators like the great-horned owl, coyote, and bobcat which can all prey on marten. In addition, fragmentation eliminates the connectivity and creates isolated individuals and populations which are more susceptible to extirpation.

8.3 - Proposed Action Environmental Consequences American Marten

8.3.1 – Analysis Area

The analysis area for the American martin includes the area within the project boundary. The Northwest Forest Plan directs the B5 pileated woodpecker/American marten areas to return to their underlying land allocation in Matrix lands except where needed to assure habitat and dispersal for the guilds of species represented by the pileated woodpecker and marten. The Forest assessed the relative importance of individual B5 areas in contributing to late seral forest conditions at the watershed landscape level. Based on that assessment, the Forest recommended that certain B5 areas be returned to the underlying land allocation and that individual watershed analysis take a closer look at the remaining B5 areas.

The West Fork Hood River Watershed Analysis looked at individual B5 areas again to validate the results of the Forest level analysis and to make a recommendation on which areas to retain. The Forest did not find a need to retain any B5 areas set aside for American marten and did not retain any B5 in the project area.

8.3.2 – No Action

If no action were taken, then no acres would be treated and there would be no direct effects to American martin. The existing condition would be maintained with little change in the short-term. In the long-term, in the absence of major disturbance events, the stand densities and canopy cover would increase. In 30 to 60 years, the stands would start to differentiate to varying degrees and there would be an increase in levels of small snags and small down wood.

8.3.3 - Direct and Indirect Effects of Proposed Action

Sapling stands do not provide habitat for this species, therefore there would be no direct impacts from sapling treatments. In the long-term, habitat for American marten would be improved in these stands because larger trees would be recruited onto the landscape more quickly in thinned stands.

Treatments would impact habitat by reducing canopy cover below 50 percent. This impact would last for up to 80 years until the remaining trees grow and conditions will again support large enough trees with greater than 50 percent canopy cover.

The increase in huckleberry development and productivity in the planning area would benefit American marten by increasing an important food source in the late summer. Suitable denning habitat would not be treated and would be maintained adjacent to huckleberry foraging areas.

The number of large diameter snags and down logs that are currently in the analysis area would not be impacted since snags and down logs would be maintained according to Forest Plan Standards and Guidelines. Snags would only be felled for safety reasons.

8.3.4 – Cumulative Effects

Past timber harvest on the Mt. Hood National Forest and adjacent lands under other ownership was considered in this cumulative effects' analysis for projects in the past, present, and foreseeable future that overlap the analysis area in time and space.

Timber harvest on federal land has reduced the amount of suitable habitat for American marten in the analysis area and will continue to do so into the future until these stands grow over time and become suitable habitat again. When combined with the impacts from the proposed action which would benefit martin, the cumulative impacts would be neutral.

8.4 - Consistency with Management Direction

The proposed action is consistent with The National Forest Management Act which requires the Forest Service to manage wildlife habitat to “maintain viable populations of existing native and desired non-native vertebrate species in the planning area.”

9.0 – Snags and Down Wood

9.1 Analysis Assumptions and Methodology

The West Fork Hood River Watershed would be analyzed for historic and current snag levels since stand level analysis does not provide a meaningful measure to snag and down wood dependent species. It is further broken down by stand structures; Eastside mixed conifer and Moist mix conifer. Management for snags and down wood are compared to unharvested stands, which represent historic conditions.

9.1.1 DecAID

DecAID is a planning tool intended to help advise and guide managers as they conserve and manage snags, partially dead trees and down wood for biodiversity (Mellen et al. 2003). It also can help managers decide on snag and down wood sizes and levels needed to help meet wildlife management objectives. This tool is not a wildlife population simulator nor is it an analysis of wildlife population viability.

A critical consideration in the use and interpretation of the DecAID tool is that of scales of space and time. DecAID is best applied at scales of subwatersheds, watersheds, subbasins, physiographic provinces, or large administrative units such as Ranger Districts or National Forests. DecAID is not intended to predict occurrence of wildlife at the scale of individual forest stands or specific locations. It is intended to be a broader planning aid not a species or stand specific prediction tool.

Modeling biological potential of wildlife species has been used in the past. DecAID was developed to avoid some pitfalls associated with that approach and uses the best available science. There is not a direct relationship between the statistical summaries presented in DecAID and past calculations or models of biological potential.

9.2 - Analysis of the Proposed Action for Snags and Down Wood

9.2.1 - Existing Condition

Across the Mt. Hood National Forest, snags and downed wood are found at lower levels than the historic range of variability due to large stand replacing fires early in the 20th century, past timber harvest and firewood cutting. Between the years of 1870 to 1920, roughly 300,000 acres or nearly one third of the Mt. Hood National Forest was burned by stand replacement fires. There have also been 350,000 acres harvested since 1900. The combination of large-scale stand replacing fires and harvest acres have contributed to the current situation where almost 60% of the forest is in a “mid stage” of stand development with relatively few large snags. However, in recent years large wildfires have burned around the Forest, including the Government Flats, 36 Pit, Gnarl Ridge, and Dollar Lake Fires creating some concentrations of snags.

The project area contains stands in the wildlife habitat type (WHT) of Eastside Mixed Conifer (EMC) and Montane Mixed Conifer (MMC) as defined in DecAID. Many wildlife species evolved to use large snags and logs that were historically more abundant on the landscape. The loss of large snags and logs from managed stands affects biodiversity and these large snags and down wood are often missing from managed stands across the Forest. Currently, there are approximately 0.5 snags per acre greater than 18 inches DBH and 1.5 snags per acre greater than 12 inches DBH across all wildlife habitat types.

Tolerance levels in DecAID for inventory data are used to describe sizes and amounts of dead wood conditions across the total area within a vegetation condition. They are calculated at the 30, 50, and 80 percent levels. The current condition of the stands in the project area is below the 30 percent tolerance levels as identified in DecAID.

For the small/medium trees in the EMC, the DecAID advisor identifies the 30 percent tolerance level for snags as 6.7 snags per acre greater than 10 inches in diameter with 2.7 of those snags greater than 20 inches in diameter. It identifies the 30 percent tolerance level for down wood as up to 6.5 percent cover of down wood (including all decay classes) with sizes of logs averaging 5 to 8 inches in diameter. For the large trees in this habitat type, the DecAID advisor identifies the 30 percent tolerance level for snags as 15 snags per acre greater than 10 inches in diameter, with 3.6 of those snags greater than 20 inches in diameter. It identifies the 30 percent tolerance level for down wood as up to 2 percent cover of down wood (including all decay classes) with sizes of logs averaging 5 to 8 inches in diameter.

For the small/medium trees in MMC, the DecAID advisor identifies the 30 percent tolerance level for snags as 10 snags per acre greater than 10 inches in diameter, with 2.7 of those snags greater than 20 inches in diameter. It identifies the 30 percent tolerance level for down wood as up to 2.5 percent cover of down wood (including all decay classes) with sizes of logs averaging greater than 5 inches in diameter. For the large trees in this habitat type, the DecAID advisor identifies the 30 percent tolerance level for snags as 11 snags per acre greater than 10 inches in diameter, with 6.5 snags per acre greater than 20 inches in diameter. It identifies the 30 percent tolerance level for down wood as up to 3.3 percent cover of down wood (including all decay classes) with sizes of logs averaging greater than 5 inches in diameter.

9.2.1.1 – Snags

Figure 1 through Figure 4 shows the reference and current conditions for EMC and MMC large and small snags in the West Fork Hood River Watershed.

Currently, 60.5 percent of the West Fork Hood River Watershed contains no large snags in EMC compared to the historic condition of 34.6 percent (Figure 1). The only category where current levels exceed historical conditions is in 0-2 large snags per acre. Currently, 15.3 percent of the watershed has between 0 and 2 snags per acre and historically that number was 14.2. This Watershed is deficient in high concentrations of snags with 8.1 percent of the area with 10 or more snags per acre historically and 1.8 percent currently.

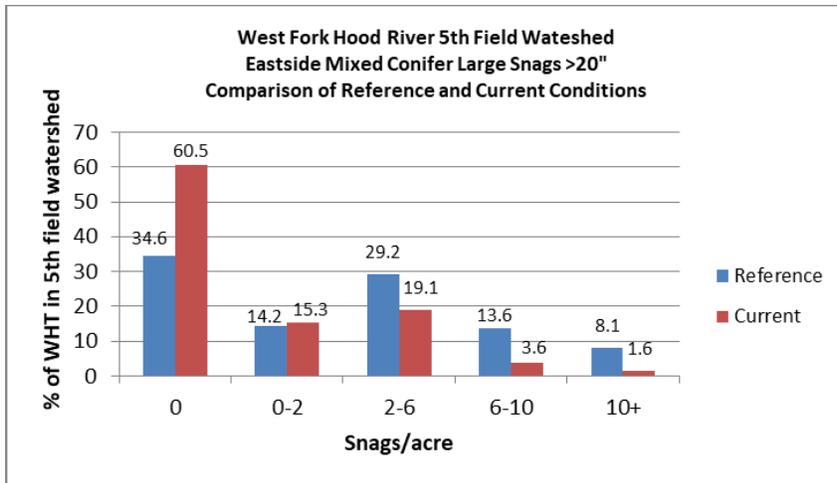


Figure 1. Comparison of Current and Reference Conditions for Large Snags in EMC

For small snags in EMC, 44.9 percent of the West Fork Hood River Watershed contains no snags compared to the historic condition of 20.1 percent (Figure 2). The only category where current levels exceed historical conditions is in 0-6 small snags per acre. Currently, 32.4 percent of the watershed has between 0 and 6 snags per acre and historically that number was 28.8. As is with the large snags, this watershed is deficient in high concentrations of small snags with 9.2 percent of the area with 30 or more snags per acre historically and 1.2 percent currently. Historically, 12.4 percent of the watershed had 18 to 30 snags per acre and only 1.6 of the watershed has this amount today.

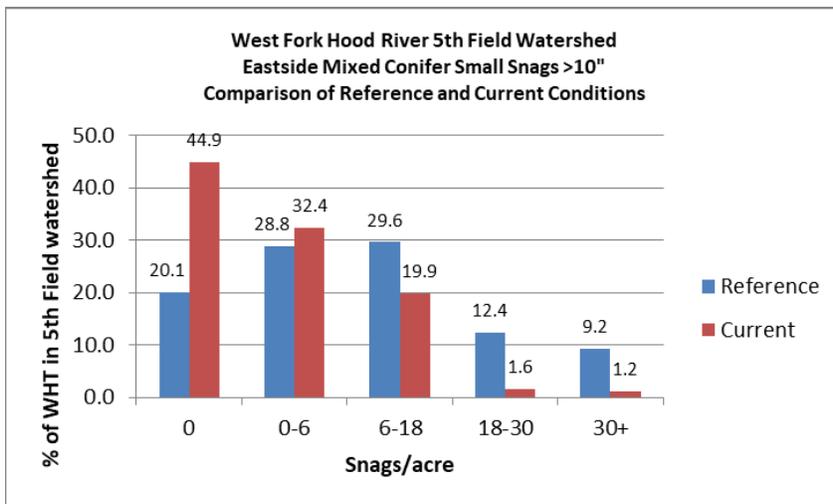


Figure 2. Comparison of Current and Reference Conditions for Small Snags in EMC.

Under current conditions, 36.9 percent of the West Fork Hood River Watershed contains no large snags in montane mixed conifer compared to the historic condition of 15.8 percent (Figure 3). The only category where current levels exceed historical conditions is in 0-2 large snags per acre. Currently, 15.8 percent of the watershed has between 0 and 2 snags per acre where historically 10.0 percent would have had 0-2 per acre. This watershed is deficient in high

concentrations of snags with 8.4 percent of the area with 16 or more snags per acre historically and 4.9 percent under current conditions. Historically, 15.9 percent of the watershed had 10 to 16 snags per acre and only 5.6 percent has this amount currently.

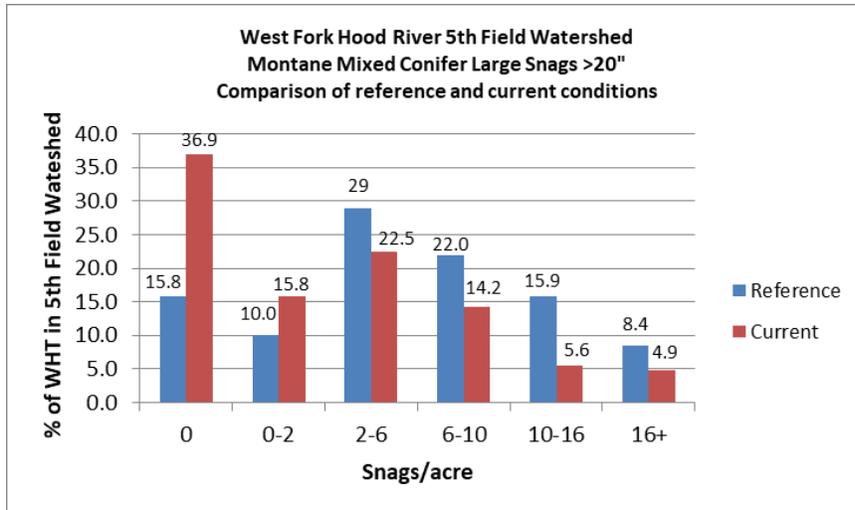


Figure 3. Comparison of Current and Reference Conditions for Large Snags in MMC.

For small snags in montane mixed conifer, 24.6 percent of the West Fork Hood River Watershed contains no snags compared to the historic levels of 6.1 percent (Figure 4). The remainder of the categories for small snag densities are comparable to historic conditions except for the category for 6 to 18 snags per acre. Historically, 44 percent of the watershed fell into this category and currently it is 31.6 percent.

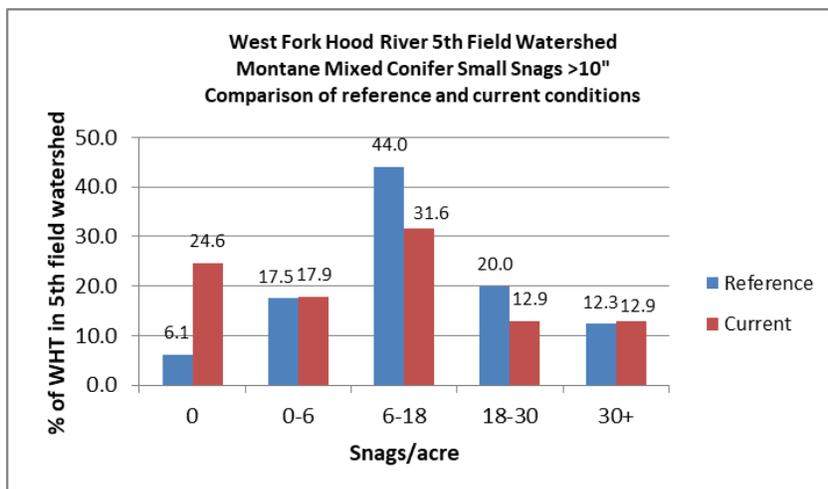


Figure 4. Comparison of Current and Reference Conditions for Small Snags in MMC.

9.2.1.2 – Down Wood

Figure 5 through Figure 8 shows the reference and current conditions for EMC and MMC large and small logs in the West Fork Hood River Watershed.

While current and reference conditions of large down logs in eastside mixed conifer are comparable, there are some differences. Historically, none of the watershed had 14 to 16 percent cover of large down logs and currently, 4.2 percent in this category (Figure 5).

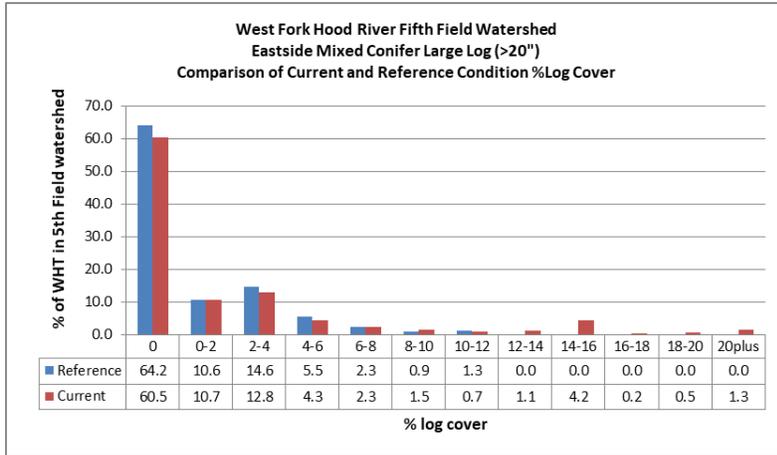


Figure 5. Comparison of Current and Reference Conditions for Large Log Cover in EMC.

Historically, 64.2 percent of the White River watershed had no cover of small down logs and currently, 44.9 percent has no small log cover. Under historic conditions, 10.6 percent of the watershed had up to 2 percent cover and currently 21.7 percent of the watershed has up to 2 percent cover of small logs (Figure 6). In this wildlife habitat type, frequent fires would have consumed much of the down wood which may account for the difference in current vs. reference conditions.

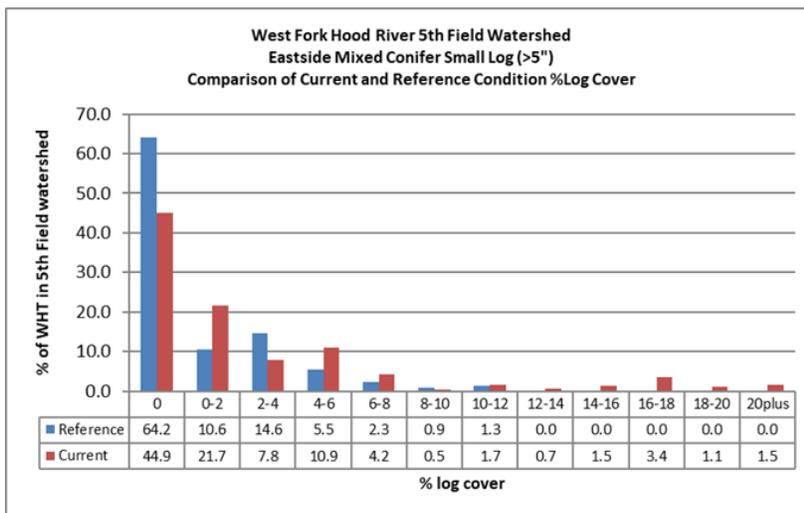


Figure 6. Comparison of Current and Reference Conditions for Small Log Cover in EMC.

Historically, 18.3 percent of the watershed had up to 4 percent cover of large down logs in montane mixed conifer and currently, 7.6 percent has no large log cover. Under historic conditions there is more down wood than would have existed historically from the 6-8 percent cover on up to 20 percent plus (Figure 7).

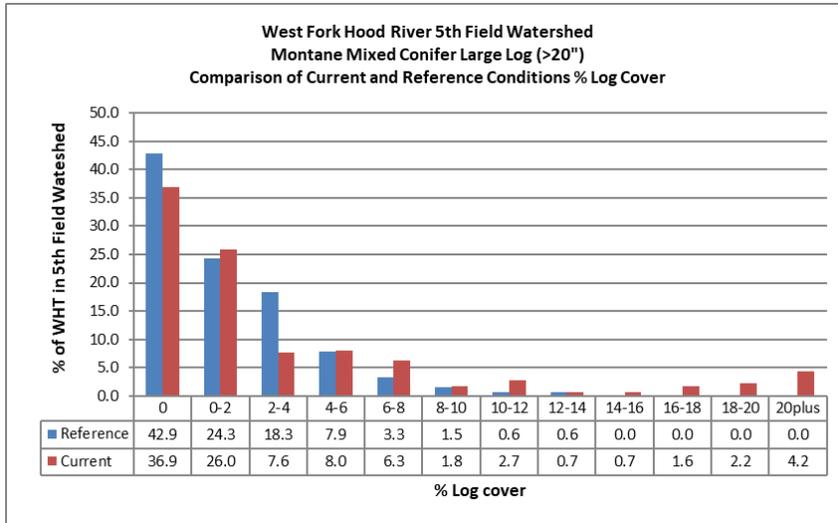


Figure 7. Comparison of Current and Reference Conditions for Large Log Cover in MMC.

There is a difference between current and reference conditions in the zero percent cover category with 10 percent cover historically and 24.6 percent currently. There is currently 8.8 percent of the watershed with 4-6 percent cover compared to 17.5 percent historically (Figure 8).

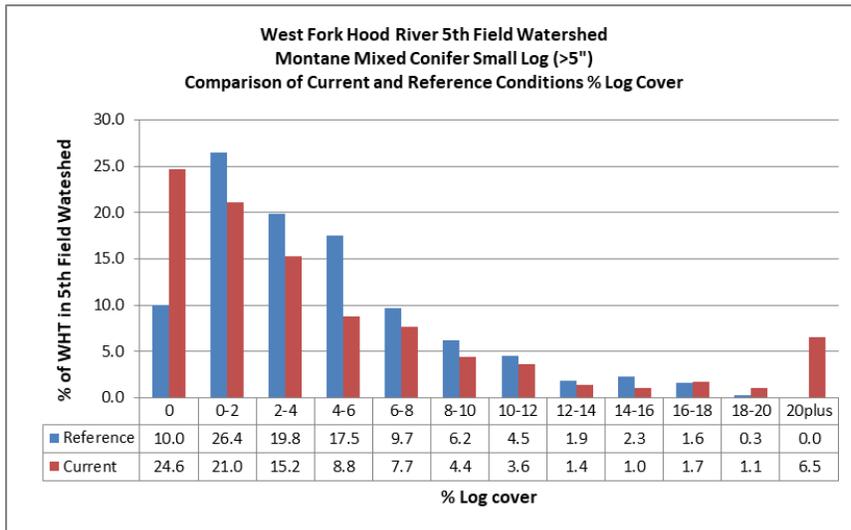


Figure 8. Comparison of Current and Reference Conditions for Small Log Cover in MMC.

9.3 - Proposed Action Environmental Consequences Snags and Down Wood

9.3.1 – Analysis Area

The analysis area includes the West Fork Hood River Watershed. Treatment units fall within the habitat types identified in DecAID as Eastside Mixed and Montane Mixed Conifer.

9.3.2 – No Action

Under the No Action Alternative, there would be slightly more snags and down wood than with the Proposed Action. This is mainly because thinning activities would reduce the canopy cover to approximately 30 percent and there would be fewer trees per acre to provide future snags.

9.3.3 - Direct and Indirect Effects of Proposed Action

9.3.3.1 - Snags

Implementation of this project could result in the loss of some snags cut for safety concerns. However, no snags are proposed to be cut as part of the proposed action and large snags that need to be cut would remain nearby. While some snags may be more prone to falling after thinning activities, the number of snags lost would not be measurable at the watershed scale. Skips and streamside protection buffers would provide short and mid-term recruitment of snags similar to the levels under the current condition.

Snags that are left standing after thinning would be more prone to wind damage and snow breakage than they would have been without thinning. There would likely be some loss of the remaining snags within 10 years after harvest which would become down wood.

Based on the snag analysis in Table 2 and Table 3, the proposed action would recruit fewer snags over time compared to the current condition. This is mainly because thinning activities would reduce the canopy cover to approximately 30 percent and there would be fewer trees per acre to provide future snags.

Table 2. Recruitment of Snags Under the Current Condition.

Years After Treatment	QMD	# of Trees per Acre	Snags per Acre ≥12" DBH	Snags per Acre ≥24" DBH
0	6.3	1275	1.1	0.1
10	6.1	1319	0.9	0.1
20	7.6	986	0.9	0.1
30	7.4	1068	1.0	0.1
40	9.1	795	1.0	0.2
50	9.0	844	2.1	0.4
60	10.8	634	4.0	0.6

Years After Treatment	QMD	# of Trees per Acre	Snags per Acre ≥12" DBH	Snags per Acre ≥24" DBH
70	11.3	610	5.5	0.8
80	13.1	485	10.1	1.2
90	14.8	404	11.2	1.5

Table 3. Recruitment of Snags Under the Proposed Action.

Years After Treatment	QMD	# of Trees per Acre	Snags per Acre ≥12" DBH	Snags per Acre ≥24" DBH
0	21.0	42	1.1	0.1
10	6.1	484	0.7	0.1
20	7.3	419	0.5	0.1
30	6.2	663	0.5	0.1
40	7.4	566	0.2	0.1
50	7.2	699	0.5	0.1
60	8.4	590	1.0	0.2
70	8.9	593	1.6	0.3
80	10.1	511	2.6	0.4
90	11.3	446	4.2	0.5

9.3.3.2 – Down Wood

Large logs (> 20 inches) existing on the forest floor would be retained. Prior to harvest, sale administrators would approve skid trail and skyline locations in areas that would avoid disturbing key concentrations of down logs or large individual down logs when possible. Snags or green trees that fall after thinning and would contribute to down wood.

An average of 6 logs per acre at least 20 inches in diameter with a volume of 40 cubic feet would be retained. In areas where logs are not large enough to meet this standard, the next smaller size logs would be maintained.

Figure 5 through Figure 8 show that the planning area and watershed have more of the area without down wood but some pockets with higher concentrations of down wood than would have existed historically. Under the proposed action, the current conditions at the watershed level would remain unchanged. While some snags may be more prone to fall after thinning and then become down wood, there will be fewer trees after thinning that would contribute to future down logs. Recruitment would not be measurable at the watershed scale. Skips and streamside protection buffers would provide short and mid-term recruitment of down wood similar to the levels under the current condition.

9.3.4 – Cumulative Effects

Past timber harvest on the Mt. Hood National Forest and adjacent lands under other ownership was considered in this cumulative effects' analysis for projects in the past, present, and foreseeable future that overlap the analysis area in time and space.

Timber harvest on state and private lands has the potential to reduce snags and down wood on the landscape. It is not likely that timber practices on private lands would provide snags and downed wood in the foreseeable future. Snag and down wood levels would remain relatively unchanged when considered at the watershed scale and therefore the cumulative effects to snags and down wood are insignificant.

9.4 - Consistency with Management Direction

FW-219 and FW-223 indicate that stands should have 6 logs per acre in decomposition class 1, 2, and 3 and that they should be at least 20 inches in diameter and greater than 20 feet in length. However, FW-225 and FW-226 indicate that smaller size logs may be retained if the stand is too young to have 20-inch trees. Under the proposed action, logs representing the largest tree diameter class present in the stand would be retained, therefore the proposed action is consistent with these standards.

Currently most of the trees are not large enough to produce snags of the desired size, (22 inches diameter, FW-234), but FW-235 allows the retention of smaller trees if the treated stand is too young to have trees of sufficient size. In this case, snags and green leave-trees retained would be representative of the largest size class present in the stand, therefore the proposed action is consistent with these standards.

10.0 – Migratory Birds

10.1 - Analysis Assumptions and Methodology

The Forest Service has implemented management guidelines that direct migratory birds to be addressed in the NEPA process when actions have the potential to impact migratory bird species of concern. The methodology for this analysis follows “Incorporating Migratory& Resident Bird Concerns into the National Environmental Policy Act Process Region Six Forest Service & OR/WA Bureau of Land Management” (Bresson 2016).

Conservation strategies for land birds of the east slope of the Cascade Mountains in Oregon and Washington and a conservation strategy for land birds in coniferous forests in western Oregon and Washington were prepared in June 2000 and March 1999 respectively by Bob Altman of American Bird Conservancy for the Oregon-Washington Partners in Flight. The strategies are designed to achieve functioning ecosystems for land birds by addressing the habitat requirements of “focal species.” By managing for a group of species representative of important components of a functioning ecosystem, it is assumed that many other species and elements of biodiversity would be maintained.

The FWS Birds of Conservation Concern and the Oregon State list was used when developing the list of species to be considered in the planning process. This analysis was completed in order to evaluate the effects of the agency’s action on migratory birds, focusing first on species of management concern along with their priority habitats and key risk factors.

10.2 - Analysis of the Proposed Action for Migratory Birds

10.2.1 - Existing Condition

Table 4 displays the focal species potentially (positively or negatively) affected by changes in habitat in the Cascade Mountains Physiographic Province, and the forest conditions and habitat attributes they represent.

Table 4. Focal Migratory Bird Species.

Forest Conditions	Habitat Attribute	Focal Species
Ponderosa Pine	Old forest, large patches	White-headed woodpecker
Ponderosa Pine	Large trees	Pygmy nuthatch
Ponderosa Pine	Open understory, regeneration	Chipping sparrow
Ponderosa Pine	Burned old-forest	Lewis’ woodpecker
Mixed Conifer	Large trees	Brown Creeper*
Mixed Conifer	Open understory, regeneration	Williamson’s sapsucker
Mixed Conifer	Grassy openings, dense thickets	Flammulated owl
Mixed Conifer	Multi-layered, structurally diverse	Hermit thrush
Mixed Conifer	Fire edges and openings	Olive-sided flycatcher*
Oak-Pine Woodland	Early-seral, dense understory	Nashville warbler
Oak-Pine Woodland	Large oaks with cavities	Ash-throated flycatcher
Oak-Pine Woodland	Large pine trees/snags	Lewis’ woodpecker
Lodgepole Pine	Mature/old-growth	Black-backed woodpecker
Whitebark Pine	Mature/old-growth	Clark’s nutcracker
Montane Meadows	Wet and dry	Sandhill crane
Aspen	Large trees/snags, regeneration	Red-naped sapsucker
Subalpine fir	Patchy presence	Blue grouse*

*Significantly declining population trends in the Cascade Mountains Physiographic Region.

Close to 30 species of migratory birds occur on the Barlow and Hood River Districts, some of which are present within the project area during the breeding season. Some species favor habitat with late-successional characteristics, such as the hermit thrush and brown creeper, while others favor early-successional habitat such as the Nashville warbler or the Williamson’s sapsucker. Other species like the white-headed woodpecker and pygmy nuthatch utilize open ponderosa pine habitat.

10.3 - Proposed Action Environmental Consequences Migratory Birds

10.3.1 – Analysis Area

The analysis area for migratory birds includes area within the boundary of the proposed action.

10.3.2 – No Action

If no action were taken, then no acres would be treated and there would be no direct effects to migratory bird species. The existing condition would be maintained with little change.

10.3.3 - Direct and Indirect Effects of Proposed Action

Research has demonstrated that thinning enhances habitat for a number of migratory species and provides habitat for some species that are rare or absent in un-thinned stands (Hagar and Friesen 2009). However, some species of migratory birds have been shown to decline following thinning. The effects of thinning in mid-successional stands would have a combination of positive, neutral, and negative impacts on migratory bird use within the stands depending on which species are present. The species that may benefit from thinning in the analysis area include the olive-sided flycatcher, Williamson's sapsucker, and chipping sparrow. The species that may be negatively impacted by thinning include the brown creeper, Swainson's thrush, and hermit warbler.

10.3.4 – Cumulative Effects

The following list of projects in the past, present, and foreseeable future overlap the analysis area in time and space and were considered in this cumulative effects' analysis: past timber harvest on federal lands, road decommissioning and road closures, pre-commercial thinning, and recreational use.

The cumulative effects of timber harvest activities are similar to the effects of the proposed action and would have a combination of positive, neutral, and negative impacts on migratory birds. Open habitat that would be created could be beneficial for early seral species like the olive-sided flycatcher and Williamson's sapsucker. The Swainson's thrush and brown creeper would be negatively impacted by habitat removal.

The cumulative effects of recreation could have substantial effects on migratory birds (Buckley, 2004, Jones and Neilson 2005). Recreation activities have been found to alter the physiology and immediate behavior of birds. Physiological responses include changes in temperature, heart rate or stress hormone (Thiel et al. 2008). Immediate responses include changes in foraging and evasion behaviors (Buckley 2004). Within bird populations responses can include changes in reproductive success and/or the number or density of birds (Buckley 2004). These studies have found a reduction in the number of nests built, eggs laid, and chicks hatched or fledged as a result of recreational activities.

10.4 - Consistency with Management Direction

The proposed action is consistent with Executive Order 13186 (66 Fed. Reg. 3853, January 17, 2001) "Responsibilities of Federal Agencies to Protect Migratory Birds." This Executive Order directs federal agencies to develop a Memorandum of Understanding (MOU) with the FWS to conserve birds including taking steps to restore and enhance habitat, prevent or abate pollution

affecting birds, and incorporating migratory bird conservation into agency planning processes whenever possible. The U.S. Forest Service has completed, and is currently implementing, its MOU with the FWS.

Within this MOU, the conservation of migratory birds on National Forest System lands focuses on providing a diversity of habitat conditions at multiple spatial scales. The proposed action is consistent with this direction by providing habitat that is currently limited on the Forest, which will in turn provide more diverse habitat types that will benefit multiple migratory bird species.

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