Jocko Lakes Fire Salvage Project

Biological Evaluation and Wildlife Report

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For:

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Abstract

This report analyzes the effects of treatments proposed in the Jocko Lakes Fire Salvage Environmental Assessment on wildlife and wildlife habitat. The proposed project would treat approximately 1650 acres of National Forest land and this report discusses the changes in wildlife habitat conditions that would occur under each of the alternatives considered. Potential effects at the landscape and site or stand scale were evaluated. Although wildlife distribution and use may shift as preferred habitats either become available or are lost, based on the analysis provided, habitat for wildlife that presently use the project area would continue to be available and viable populations of local wildlife would be maintained. Based on analysis presented in this report and in the project Biological Assessment (BA), there are no anticipated effects under any alternative that would contribute in a trend towards Federal listing or cause a loss of viability for any Regionally Sensitive species or adversely affect any Threatened or Endangered species. Also there would be no population-level effects or threats to management indicator species (MIS) and this project complies with the Lolo National Forest (ANF) Land and Resource Management Plan (Forest Plan) (USDA-FS 1986) and all regulatory direction related to wildlife (FSM 2600).

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Introduction and Proposed Action

During the summer of 2007, the Jocko Lakes wildfire burned across approximately 11,600 acres of National Forest System Lands (NFS) on the Seeley Lake Ranger District (RD) of the Lolo National Forest (NF). In order to recover economic value from merchantable timber that died after the Jock Lakes fire, the Seeley Lake RD is proposing salvage harvest on 1,648 acres of NFS land. Proposed activities also include supplemental planting, road maintenance, road decommissioning/storage and non-native invasive weed treatments. The Jocko Lakes Fire Salvage (JLFS) project area is located in northwestern Montana approximately three miles west of the community of Seeley Lake.

This report analyzes impacts to wildlife and wildlife habitat from federal activities proposed in the JLFS Environmental Assessment (EA). It considers regulatory direction related to the wildlife resource, describes the current wildlife habitat conditions that exist within the JLFS project area and evaluates effects to Regionally Sensitive (Sensitive) and Management Indicator Species (MIS). Because wildlife distribution and use is determined by both site specific and landscape level conditions, a multi-scale analysis is presented that looks at specific stands proposed for treatment (fine filter analysis), as well as landscape considerations (coarse filter analysis) such as the availability of habitat within and adjacent to the project area. Although this report includes effects to Federally Threatened and Endangered (T&E) species, more detailed information on T&E species is presented in the JLFS Biological Assessment (BA).

The Seeley Lake Ranger District is proposing to salvage timber within the area burned by the Jocko Lakes fire of 2007. The Forest's proposed salvage logging would be limited to approximately 22 percent (1648 acres) of the total area of NFS lands burned by the fire. Other NFS lands within the fire perimeter (approximately 36,000 acres) would remain in their current post-fire condition. The proposed action is summarized in Table 1 and would include:

- Salvage harvest a total of 1648 acres. Tree mortality within the project area is either a result of the fires, post-fire stress, or pre and post-fire insect damage and only dead trees would be harvested.
- Maintain approximately 55 miles of classified NFS road to be used as haul routes for the salvaged timber.
- Complete supplemental planting on 1,056 acres to ensure that ponderosa pine and western larch are maintained and to regenerate sites where natural regeneration may not be adequate.
- Construct 4.0 miles of temporary or shot-term specified roads to access proposed salvage areas. These roads would be decommissioned (fully re-contoured and restored) following salvage activities.
- Store or decommission approximately 10.2 miles of unneeded classified NFS roads and unclassified roads to mitigate potential sedimentation from the log haul.
- Conduct ground-based noxious weed herbicide treatments along approximately 63 miles of NFS road and disturbed areas such as landings, and the 11 miles of decommissioned roads in order to mitigate potential weed spread from harvest.

Table 1: Proposed Action

Activity	Amount
Timber Harvest	
Salvage harvest	1,648 Acres
Logging System	
Skyline Yarding	77 acres
Tractor	1,571 acres
Supplemental Planting	1,056 acres
Transportation	
Road Maintenance	55 miles
Road Decommissioning	3.5 miles
Road Storage	5.2 miles
Store or Decommission	2.0 miles
Short-term Spec Road	2.0 miles
Temporary Road	2.0 miles
Non-native Invasive Weed Treatment	
Along Roads	@ 63 miles
Disturbed Areas	TBD[a]

[a] - TBD – to be determined during implementation

Timing and Duration of Activity – The activity would be under a three to five year timber sale contract beginning in 2009 and it is anticipated that all harvest, road work and invasive weed treatments would be implemented by 2012.

Regulatory Framework

The principle laws and management direction relevant to wildlife management are the; National Forest Management Act of 1976 (NFMA), the Endangered Species Act of 1973 (ESA), the Migratory Bird Treaty Act (MBTA) of 1918 (as amended) and the Forest Service Manual (FSM). The following is a summary of these laws/direction related to wildlife:

- NFMA requires the Forest Service to manage fish and wildlife habitat to maintain viable populations of all native and desirable non-native vertebrate wildlife species and conserve all listed threatened or endangered species populations (36 CFR219.19).

- Under provisions of the ESA, federal agencies are directed to seek to conserve endangered and threatened species and to ensure that actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of any threatened or endangered species, or result in the destruction or adverse modification of their critical habitats. Whenever an action may affect a species that is listed (or proposed for listing) or its habitat, federal agencies must consult with the U. S. Fish and Wildlife Service

- Forest Service Manual direction provides additional guidance to proposed and listed Threatened and Endangered (T&E) species and requires that the Forest Service identify and prescribe measures to prevent adverse modifications or destruction of critical habitat and other habitats essential for the conservation of endangered, threatened and proposed species (FSM 2670.31 (6)).

- The Forest Service Manual directs the Regional Forester to identify sensitive species for each National Forest where species viability may be a concern. Under FSM 2670.32, the manual gives

direction to analyze, if impacts cannot be avoided, the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole.

- The Migratory Bird Treaty Act (MBTA) established an international framework for the protection and conservation of migratory birds. This Act makes it illegal, unless permitted by regulations, to "pursue, hunt, take, capture, purchase, deliver for shipment, ship, cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird."

Forest Plan Direction

The principle policy document relevant to wildlife management on the Forest is the 1986 Lolo National Forest Land and Resource Management Plan (Forest Plan)(USDA-FS 1986). The Forest Plan contains the following goals, objectives, management direction and standards and guidelines related to management of the Forests wildlife resource.

Forest Plan Goals

- Provide habitat for viable populations of all indigenous wildlife species and for increasing populations of big game animals (USDA-FS 1986 p. II-1)

- For T&E species occurring on the forest, manage to contribute to the recovery of each species (USDA-FS 1986 p. II-1).

Forest Plan Objectives

- Roads would be kept to a minimum number and size needed to support resource management: most roads would be closed when projects are implemented to protect resource values (USDA-FS 1986 p. II-2)

- Provide for recovery of T&E species, including regulation of access and use in occupied grizzly bear habitat (USDA-FS 1986 p. II-2).

- Support expansion of populations for T&E species (USDA-FS 1986 p. II-2).

- Enhance food producing areas and improve habitat (USDA-FS 1986 p. II-2).

- Increase big game populations, particularly elk (USDA-FS 1986 p. II-2).

- Give special attention to species dependent on snags, old growth and riparian habitat (USDA-FS 1986 p. II-2).

Management Area Direction and Standards

The Forest Plan divides NFS lands into 28 management areas (MA), each with specific standards to achieve management goals. Table 2 displays the amount of each MA within the project area, the acreage proposed for treatment and the Forest Plan reference for standards within each MA.

Table 2: Management Area Summary

Management Area	Project Area Acres	Acres Proposed for Treatment	Standards for Wildlife[a]
MA 13 - Water/riparian habitat	927	2	III-56-62
MA 16 – Suitable timber lands, diverse habitat conditions	5063	1270	III-70-75
MA 17 – Suitable timber lands, diverse habitat conditions	75	12	III-78-81
MA 23 – Big game winter range	12	3	III-112-118
MA 25 – Suitable timber, moderate visual sensitivity	1258	359	III-135-139

[a] – USDA-FS 1986

Management Areas 13 – consists of lakes, lakeside lands, major second-order and larger streams and the adjoining lands that are dominated by riparian vegetation. Goals include management of riparian areas to maintain or enhance their value for wildlife, recreation, fishery and aquatic habitat, and water quality. Management standards are designed to enhance fish, aquatic habitat, wildlife, and water quality. Also activities shall be compatible to assure long-term maintenance of these resource values. Roads are permitted, but are to be designed to cross, rather than parallel streams and to provide for fish passage (USDA-FS 1986 pp. IV-35-37). INFISH (USDA-FS 1995) standards apply to lands within Riparian Habitat Conservation Areas (RHCAs), and riparian dependent resources are to be given preferential treatment on lands suitable for timber production.

Management Areas 16 & 17– These lands are suitable for timber production and consist of a variety of physical environments and habitat groups. Although little fish habitat is provided, these lands include headwater streams and are important in ensuring that water quality is maintained to meet fishery and aquatic needs. An extensive road system is in place and roads would be open or closed to public use as determined by the Forest Travel Plan. Major collector roads would be left open while minor collector and local roads would be open to a lesser degree and often only on an intermittent basis. The goals are to provide for healthy stands of timber, optimize sustained timber production, provide for dispersed recreation opportunities, wildlife habitat, livestock use, and maintain water quality and stream stability (USDA-FS 1986 p. III-71). Standards are designed to minimize runoff, maintain riparian vegetation and protect important big game habitat. Timber harvest practices would provide for a mixture of species with emphasis on maintaining the ponderosa pine and western larch components. Dead or down trees may be salvaged, if habitat needs for cavity nesting wildlife species are maintained (USDA-FS p. III-72).

Management Area 23 – This area includes primarily lands below 5,000 ft. in elevation on south-facing slopes. These lands are important winter range for big game and generally are adjacent to or visible from major roads, communities, trails or other high use areas. Goals include providing optimal cover/forage ratios within deer, elk and bighorn sheep winter ranges, while meeting visual objectives. Timber harvest may be used to maintain or improve big-game winter range and a cover/forage ratio of 50:50 would be maintained. The majority of cover should consist of trees 40 ft. in height or greater, with a crown density greater than or equal to 50 percent. Dead and down trees may be salvaged when constrained by habitat needs of cavity nesting wildlife (USDA-FS 1986, p. IV-30).

Management Area 25 - consists of lands not on winter range with a moderate degree of visual sensitivity. Goals include providing for healthy stands of timber and optimizing timber growth, while providing for dispersed recreation opportunities, wildlife habitat and livestock use. Standards are in place to protect riparian habitat and water quality and dead and down trees may be salvaged, if the needs for cavity nesting wildlife species are maintained (USDA-FS 1986 III-33-34).

Method of Analysis

Analysis Process

National Forest Management Act (NFMA) regulations, adopted in 1982, require that habitat be managed to support viable populations of native and desired non-native vertebrates within the planning area (36 CFR 219.19). USDA regulation 9500-004, adopted in 1983, re-enforces the NFMA viability regulation by requiring that habitats on national forests be managed to support viable populations of native and desired non-native plants, fish, and wildlife. The following 5-step process is used in this analysis to assess changes in wildlife habitat and determine possible effects to viability:

Step 1: Pre-field Assessment - The analysis process related to wildlife started prior to identification of proposed activities. For example unique habitats such as old growth, inventoried roadless areas, or uncommon or high use habitats such as riparian areas were identified. Because it was recognized that these areas are important to maintaining species viability and biodiversity, these areas were excluded from treatment early in the planning process. Once the proposed action was identified, information was collected to identify the wildlife present condition or affected environment. This information included aerial photos, GIS data, past timber sale activity, existing wildlife surveys, Forest and district monitoring and wildlife observation data, pre-fire vegetation surveys, and remote sensing data related to fire intensity and mortality.

Step 2: Field Assessment –Sites proposed for treatment and some high priority habitat such as old growth or potential old growth were visited by a biologist(s). During this review, observations and incidental sign of wildlife were recorded and habitat conditions identified in the pre-field assessment were validated and described (See project file). Northern Goshawk surveys were conducted within portions of the project area most likely to provide desired nesting habitat and the availability of standing and downed woody debris (DWD) was assessed.

Step 3: Wildlife Screening - Collectively information from the pre-field and field assessments were used to identify project mitigation measures or modifications to the proposed action that may be necessary to reduce or eliminate impacts to wildlife This information was then used in combination with the most recent scientific literature, Forest and Region wide assessments and monitoring, and species conservation assessments to identify species and habitats most likely to be affected by the proposed activities and identify the appropriate level of analysis necessary to determine effects to wildlife. Based on this analysis, six species were not carried forward for detailed analysis in this report. Table 12 identifies these species and provides rationale as to why they were eliminated from detailed study. This preliminary analysis identified 13 species that may be adversely affected by the proposed activities or alternatives. These species were carried forward into steps 4 and 5 and are displayed in Table 14.

Step 4: Habitat & Species Assessment –The analysis of the wildlife resource was done using a multi-scale assessment that includes a combination of three basic strategies. These include; 1) a coarse filter approach (described below), which is used to identify wildlife communities across the watershed. This approach assumes that if the species, genetics, functions and processes are protected at the community level, then the bulk of the biotic species, both known and unknown, would also be protected, 2) the second strategy is the MIS approach (FSM 2620.1, 2621.4, 2620.3), which assesses effects to wildlife species associated with vegetation communities or key habitat components identified in the Forest Plan (USDA-FS 1986) as management indicators. Potential effects of proposed actions are then evaluated by assessing habitat changes to the selected indicator species and 3) the third strategy is to assess habitat and effects to those species considered most at risk and/or those species with potential viability concerns. These include

Federally Threatened and Endangered Species and Regionally Sensitive species (FSM 2670.32, 16 USC 1536).

Using information from steps 1-3, anticipated changes in wildlife habitat and the associated communities are predicted under the alternatives considered and associated effects to wildlife and wildlife habitat evaluated. Information from steps 1 and 2 are used to complete the coarse filter analysis, identify and evaluate spatial relationships between habitat(s), assess changes in landscape diversity and predict changes and effects to MIS species. Whereas site-specific data is used to assess stand level changes in habitat and to ensure that unique vegetative and physical habitat conditions are maintained and/or protected. This information is also used to assess changes in population viability in Step 5.

Step 5: Population Viability Assessment- Using information from Steps 1-4, the population viability for all MIS and Threatened, Endangered and Sensitive (TES) species evaluated in detail is assessed under each of the alternatives (FSM). Region 1 (R1) uses a principle-based approach to population viability analysis (PVA), which follows Regional direction in Samson (2002). This assessment is based on the best available forest and rangeland vegetation data, the most current scientific information related to species requirements and effects of proposed actions, and when available, Region and Forest-wide conservation assessments. Collectively this information is used to assess the availability of suitable habitat and ultimately assess short and long-term viability to each species.

Collectively the strategies and assessment described above are used to ensure that National Forest Management Act (NFMA) requirements are met by ensuring that a diversity of plant and animal communities are maintained across the planning area (16 U.S.C. 1604(g)(3)(B); also see 36 CFR 219.10(b); and FSM 2670.12). Professional judgment is the basic method used to forecast effects. This judgment is backed by applying the most applicable scientific information related to wildlife on the Lolo NF, through experience assessing impacts from proposed activities to wildlife and wildlife habitat from similar proposed actions, and through informational consultation with the USFWS.

Scale of Analysis

The appropriate methodology and level of analysis needed to determine effects are influenced by a number of variables including the presence of species or habitat, the scope and nature of activities associated with the proposed action and alternatives and the potential risks that could ultimately result in adverse effects. Wildlife distribution and use of an area is largely determined by the availability of suitable habitat and can be influenced by site specific needs such as the vegetative structure or physical features on a site, as well as by landscape considerations such as the proximity to other habitat or the need for isolation or seclusion. As a result a multi-scale analysis that looks at site specific conditions in stands proposed for treatment (fine filter), as well as landscape considerations such as the proximity and availability to other habitat (coarse filter) will be considered. The multi-scale of analysis used in this assessment includes the following:

Site Level Assessment – This level of assessment involves evaluation of individual stands or sites proposed for treatment. Sites at this scale vary in size from 1 to 168 acres. Wildlife use is often influenced by specific conditions that can only be identified at the stand or site scale. This level of analysis identifies stand level habitat conditions that influence wildlife use. This assessment is also used to identify habitat features that may need to be protected or enhanced and is used to identify site-specific mitigation measures or Project Design Features (PDF).

Project Area Assessment – Direct and indirect effects to wildlife are assessed by evaluating effects and changes in habitat on National Forest System (NFS) lands within the project area boundary. The JLFS project area encompasses approximately 12,000 acres including 7,381 acres of NFS land, 3,856 acres of

private land and 644 acres of state land. The project area boundary was selected for analysis of direct and indirect effects on wildlife because it includes all areas proposed for treatment and contains an adequate diversity of habitat conditions (vegetative and topographic) to assess wildlife distribution and use. Also the burning severity (i.e. mix of high, moderate and low) within the project area is similar and representative of that found within the Jocko Lakes fire perimeter.

Cumulative Effects Assessment – Cumulative Effects (CE) related to wildlife are evaluated by looking at past, present and foreseeable future activities which could adversely affect wildlife when considered cumulatively over time. When considering CE's to wildlife and based on past and anticipated future disturbances, the primary factors of change include timber harvest, wildfire, insect and disease related tree mortality, road construction and management, private land development and recreational use (See Appendix D for a complete list of Past, Present and Future Actions). The CE boundary used in this analysis would vary somewhat by species. For example, CE's for species with small home ranges would be analyzed across the project area, whereas CE's to species such as the black-backed woodpecker (BBW) that are largely dependent on post-fire habitat, would include the entire Jocko Lakes fire perimeter, which totals approximately 36,400 acres. The broader context of post-fire habitat availability across the Lolo NF and R1 would also be considered for this species. For species that have large home ranges and select habitat based partially on landscape conditions, the CE analysis area used includes the collection of the 6th field Hydrologic Unit Codes (HUC) that contain proposed activities. This area totals approximately 40,500 acres and includes all of the Boles and Finley/Slippery 6th field HUCs (34,393 acres) and 6,146 acres of the Seeley/Archibald 6th field HUC. Rationale for selection of this area includes:

- This area is large enough to assess the individual home range for all species analyzed, thereby framing the context and significance of potential impacts to each species.
- The CE area includes over 60 percent of the Jocko Lakes fire perimeter, as well as large areas of unburned habitat. As a result the CE area can be used to adequately assess impacts to species affected by the fire, as well as species that would avoid or would be displaced by post-fire habitat. Also based on a GIS analysis of the fire burning conditions, the mix of burning severity within the CE area is representative of that found within the Jocko Lakes fire perimeter.
- The CE area includes private lands immediately to the east of the project area that have been affected by past private land development, as well as developed and dispersed recreation in the Seeley Lake area.
- While this area does not include all private industrial lands affected by the Jocko Lakes fire, it does include additional acreage of more intensively harvested Plum Creek lands and the level of past and anticipated future harvest on these lands, as well as NFS lands is expected to be representative of those found in the area.
- Expanding the CE area further to the west would include less intensively managed lands (South Fork Jocko Tribal Primitive Area), which would tend to "dilute" potential cumulative effects. Similarly, lands within the Seeley Lake/Archibald watershed east of the Clearwater River were not included in the CE area, because a GIS analysis indicated that management (timber harvest and recreation) and wildlife habitat conditions (Forest types and structural conditions, habitat groups and management area emphasis) within that portion of the CE area were similar and representative to the remainder of the HUC. As a result, expanding the analysis area an additional five miles beyond the fire perimeter (to include the entire watershed) would tend to "mask" the effects of treatment, without changing the type or level of cumulative effects anticipated.

- By following primarily natural boundaries (watershed/drainage), a full range of topographic and vegetative conditions, which influence wildlife distribution and use would be considered.

Appendix D of the JLFS EA provides a summary of past and foreseeable future actions that have occurred within the project area and includes future activities listed on the Forest's Schedule of Proposed Actions (SOPA), and reasonably foreseeable actions on non-federal lands. Although due to the uncertainty of management actions and lack of detailed habitat data on these non-federal ownerships, when assessing risks to viability, the USFS assumes no contribution of suitable habitat for sensitive species/MIS from adjacent property.

Forest and Regional Assessments – In order to more accurately assess the availability of habitat across the landscape, when available, the Forest and Regional assessment provided by Sampson (2006a and 2006b), as well as the Forest-wide availability of old growth habitat (as defined by Green et al 1992) is considered in this analysis.

Timeframes

Timeframes for direct and indirect effects include short term effects, which generally go out five to ten years, or until the proposed activities are completed and long-term effects, which are greater than ten years and may go out several decades. Although some historic effects are considered, the CE analysis spans a period of approximately 55 years and runs from the mid 1950s, which is the period of time when recent timber harvest began, to 2012 which is the time when all of the proposed treatments are expected to be completed (including road decommissioning), as well as the time when future projects can be reasonably predicted.

Project Area Description and Affected Environment

The JLFS project area totals approximately 11,900 acres, including 7381 acres of National Forest System (NFS) lands, 3,856 acres of private industrial forest (Plum Creek) land and 644 acres of State lands. Table 3 displays the vegetative communities, forested structural conditions, habitat groups, and available stream, standing water and riparian habitat within the project area. Fire severity, which is a measure of the post-fire appearance of the vegetation as it relates to the intensity of the fire and its consumption on vegetation is also displayed.

Habitat Condition

Because the presence of many wildlife species would be partially determined by the habitat conditions that existed prior to the Jocko Lakes fire, this section displays both the pre-and post fire habitat conditions on NFS lands within the JLFS project areas.

Pre-Fire Habitat

Approximately 60 percent of the project area consists of mature forest containing predominately sawtimber sized trees (>9 inches dbh) with a closed canopy, approximately 36 percent consists of second growth forest containing predominately five to nine inch diameter trees, and 2 percent of the area contains seedling forest with a predominance of trees less than five inches in diameter and a grass/forb understory. Table 3 also displays project area habitat groups and while approximately 10 percent of the project area contains drier site conditions (Habitat Groups 1 and 2), open grown stands of predominately ponderosa pine and Douglas-fir are uncommon and exist primarily as minor inclusions. Over 90 percent of the project area consists of upper elevation lands characterized by cooler sites that are dominated by mixed or

pure stands of Douglas-fir, lodgepole pine, and western larch, with inclusions of ponderosa pine, Engelmann spruce and subalpine fir.

Approximately 95 percent of the project area was burned during the Jocko Lakes fire, with moderate to severe burning occurring on over 70 percent of the project area (See burning descriptions below). As a result wildlife cover and forage conditions have been greatly altered, as have levels of standing dead trees (snags) and downed woody debris (DWD). Although severely burned areas are scattered across the project area, some of the largest blocks of severely burned areas occurred in the Placid Creek drainage, portions of Finley Creek drainage and near Hidden Lake.

Table 3: Project Area Habitat & Fire Severity Summary

Pre-fire Habitat Conditions	% of Project Area
Cover Type (acres)	
Forest	98
Non-Forest	<1
Water	1
Total	100
Forest Structural Condition (acres)	
Seedling (<5" dbh, grass/forb understory)	2
Sapling/Pole (generally 5-9" dbh)	36
Mature/Sawtimber (generally >9" dbh)	54
Old Growth (defined by Green et al 1992)	6
Habitat Group[a] (acres)	
1 (warm and dry – open grown PP)	<1
2 (moderately warm and dry – mix of PP & DF)	9
3 (moderately cool and dry – mix of PP, WL, LP and DF)	5
4 (moderately cool and moist – mix stands of PP, WL, LP & DF).	34
5 (cool and moderately dry – pure stands of LP, DF, WL & spruce)	51
Water/Riparian	
Streams (miles)	
Lakes (acres)	<1
Swamps/wetlands (acres)	1
Riparian Conservation Area (acres)	19
Roads & Trails (miles)	
Total Roads	4.4 mi/mi^2
Open Roads	3.2 mi/mi^2
Pedestrian Trail	.15 mi/mi^2
Snowmobile Trail	1.5 mi/mi^2
Security Habitat (acres)	
Lands >1/4 mile from an open road	23
Lands >1/4 mile from a snowmobile trail	56

[a] - Species Codes – PP-Ponderosa Pine, DF-Douglas Fir, WL-Western Larch, LP-Lodgepole Pine

Almost 20 percent of the project area falls within a Riparian Conservation Area (300 ft. of a perennial stream or water body & 100 ft. of an intermittent stream), with emergent wetlands and swamps scattered across portions of the Archibald and Placid Creek drainages. Although there are no lakes within the project area, Seeley and Placid Lakes are within a mile of the project area and Hidden Lake is immediately adjacent. A large emergent wetland also occurs on Plum Creek lands in T16N, R16W Section 15, immediately adjacent to NFS lands.

The project area contains predominately big game (elk and deer) summer range, although portions of the project area are used year-round by both deer and elk (Habitat Group 3). Only 12 acres occur as big game winter range (MA 23) and there is no critical elk winter range (identified by the Montana Fish, Wildlife and Parks) within the project area.

Wildlife habitat and use within the project area can be influenced by the level of human activity and due in part to its proximity to Seeley and Placid Lakes, lands within and near the project area receive year-round recreational use. Most of the existing use consists of driving for pleasure, snowmobiling, cross-country skiing, hunting, fishing and dispersed recreation, with fishing, hunting and snowmobiling being especially popular. There are approximately 17 miles of snowmobile trail and over 50 miles of road that traverse much of the NFS lands within the project area. This use reduces wildlife security habitat and currently less than 25 percent of NFS lands are greater than ¼ mile from an open road. Snowmobile use also affects wildlife security and while approximately 50 percent of the project area (NFS lands) is greater than ¼ mile from a groomed snowmobile trail, lands in the NE corner or the project area contain a much higher density of snowmobile trail and are affected by snowmobile use. The project area also contains approximately 1.7 miles of pedestrian trail in the southwest corner of the project area. Although there is no developed recreation near the project area, both Seeley Lake (1 mile) and Placid Lake (3 miles) contain popular developed campgrounds.

Dead Wood

Information used to assess dead wood included pre-fire aerial photography, stand exams, Northern Region Vegetation Mapping Project (R1-VMP) data, field surveys of snags and downed logs in the project area, project area field visits, post-fire walk-through surveys, research literature, and GIS coverage's and data sets for old growth, stand and landscape structural characteristics and past management activities. Where information was unavailable, interpretations were made based on photo interpretation and professional experience. Burn severities for vegetation were derived from field surveys (See project file) and photo interpretation and LANDSAT thermal imagery data (RAVG, and BARC). This analysis also relies heavily on direction related to dead wood provided in the Forest Plan (USDA-FS 1986), the Lolo NF Downed Woody Material Guide (USDA-FS 2006) and the Northern Region Snag Management Protocol (USDA-FS 2000a), all of which are incorporated by reference into this analysis.

This analysis covers standing and downed woody debris (DWD) as it relates to wildlife and wildlife habitat. See the Fisheries section of the JLFS EA for consideration of large wood recruitment in aquatic systems, the Soils section for discussion of the importance of dead wood for nutrient cycling and the Fire/Fuels Section for a discussion of fuel loading. Also while anticipated effects on old growth wildlife habitat are discussed here, the vegetation section of the JLFS EA discusses old growth and LNF direction related to this important community in more detail.

Dead wood, including both standing and DWD is discussed here because many MIS and Sensitive species (discussed below) rely on this important habitat component. Dead wood contributes to biological richness in many ways: as substrate, cavity sites, foraging sites, nesting or denning sites, food storage sites, runways and cover or shelter (Bull & others 1997 *In* USDA-FS 2008). It is estimated that about one third of the bird and mammal species that live in the forests of the Rocky Mountains use snags for nesting or denning, foraging, roosting, cover, communication, or perching. Marcot and others (1999 *In* USDA-FS 2008) list 57 wildlife species plus four species groups associated with snags, and 20 wildlife species associated with hollow living trees. In addition, large snags and downed wood play central roles in diverse ecosystem processes and functions such as nutrient recycling, shelter for growing trees, and habitat for wildlife and fish (Rose et al. 2001 *In* USDA-FS 2008).

Reliance on dead wood habitat occurs at a variety of scales, from large landscapes, to small patches, to individual snags or downed logs. More mobile species that depend on dead wood habitat include black bears, Canada lynx, wolverines, marten, fisher, bats, woodpeckers, and owls. Less mobile species that depend on dead wood include snowshoe hares (the primary prey of Canada lynx), red-backed voles (the primary of prey of marten, fisher, boreal owl, northern goshawk, and several other species), and shrews (Bull and Blumton 1999, Raphael and Jones 1997; Brown et al. 2003 *In* USDA-FS 2008).

The number, species, size, and distribution of snags also affect snag-dependent wildlife. Large-diameter snags are particularly important because they occur in fewer numbers and many species require large diameter snags for nesting. Large diameter snags also remain standing longer and are much more likely to develop suitable decay conditions for cavity-using species (McClelland 1979, Bull et al. 1997, Daenzer 2007 *In* USDA-FS 2008).

Western larch, Douglas-fir, and deciduous tree snags are the species predominately used by cavity-using birds and mammals in the JLFS area. Most are relatively resistant to windthrow and are less likely to require felling for safety concerns. Smaller-diameter snags also get some use as nest habitat by some species. However, their greatest value in the early post-fire environment is for feeding habitat, particularly when high densities of smaller-diameter snags are available. Also important is the role that smaller snags play in helping to keep other snags standing (Russell et al. 2006 *In* USDA-FS 2008).

Downed trees and other woody material are critical for many species (Maser et al. 1979 *In* USDA-FS 2008). In the Pacific Northwest, 47 vertebrate species respond positively to downed wood (Bunnell et al. 2002 *In* USDA-FS 2008). Downed logs and stumps are required for denning and resting, are vital for hunting below the snow in winter (Buskirk and Ruggiero 1994 *In* USDA-FS 2008), and are also used as travel cover, particularly when living plant cover is absent. American marten often den and forage in the under-snow cavities that occur under downed logs. Canada lynx, fisher, and wolverine dens are associated with abundant woody debris, usually large-diameter logs (Bull et al. 2001). Winter wrens do most of their feeding underneath suspended logs (Stewart et al., 2004 *In* USDA-FS 2008). Several amphibians and reptiles make use of large woody debris for shelter and breeding sites (Bull et al., 1997). Many ant species that need large-diameter downed logs are major predators of defoliating insects such as western spruce budworm (Torgersen and Bull 1995 *In* USDA-FS 2008). Longer and larger-diameter downed trees are generally most important because they can be used by a far greater range of species. In addition, they provide stable and persistent structures as well as better protection from weather extremes. A variety of sizes and decay classes are needed in downed wood “in order to conserve functional processes that foster sustainable forest ecosystems” (Torgersen and Bull 1995 *In* USDA-FS 2008).

Standing and downed dead trees have many ecological roles in a landscape recovering from wildfire (Beschta et al. 1995, Saab and Dudley 1998, Smith 2000, Brown et al. 2003, Beschta et al. 2004, Saab et al. 2004 *In* USDA-FS 2008). The snags and down logs that result from fire serve a vital role in the structure and function of healthy forest ecosystems and play an important role in post-fire recovery and long-term site productivity. Also Hutto (1995) found that 15 species of birds were more frequently found in post-fire habitats than in any other major cover type in the northern Rockies.

Existing Condition

The Lolo NF has long recognized the importance of dead wood and woody material is directly related to four of the eight Lolo Forest Plan goals (USDA-FS 1986 p. II-2). Woody material is also listed in several of the Lolo Forest Plan Standards (identified above) and collectively this management direction emphasizes the importance the LNF places on providing adequate dead wood to meet a variety of resource objectives. Further, maintaining large diameter dead wood was recognized early in the planning process, when the decision was made to; only harvest 15 percent of the total burn area, avoid stands

meeting old growth criteria; and by the decision to retain large diameter snags (>= 21 inches dbh) in all areas proposed for treatment.

Pre-fire snag availability is displayed in Table 4 and snag availability can vary by forest type. Western larch represents the largest density of large diameter snags greater than 16 inches. Although the western larch forest type only makes up 29 percent of the project area, large diameter western larch are scattered across all forest types and when evaluated by species, western larch makes up an estimated 60 percent of all the snags greater than 20 inches dbh. Conversely there are very few large diameter snags within the lodgepole pine forest type, which contains primarily small to medium diameter snags (5-16 inches dbh).

In order to assess the amount and distribution of standing dead wood, snags were broken down into the four size categories. To date approximately 45 percent of the project area has had some form of past harvest. Areas that were harvested prior to the Forest Plan (USDA-FS 1986) likely contained few snags. Sites harvested after 1986 would be expected to contain some medium to large diameter snags, although available snags would be largely limited to small diameter snags <10 inches dbh on many of these sites. Although the availability of snags varies greatly by forest type and site, prior to the Jocko Lakes fire there was a fairly good distribution of small and medium diameter snags across the project area landscape. Although the availability of large diameter snags (>20 inches dbh) were widely scattered, with moderately warm and dry ponderosa pine and Douglas fir (habitat group 2) containing a greater large snag component.

Table 4: Pre-fire Snag Summary

Forest Type	% of Project Area	Snags/acre				
		Total	5.0-.9.9”	10-15.9”	16-20”	>20”
Habitat Group 2	9%	16.3	9.5	.6	.1	1.4
Habitat Group 3	5%	8.9	4.9	2.8	.9	.4
Habitat Group 4	34%	19.4	12.0	6.1	.8	.6
Habitat Group 5	51%	19.7	14.6	4.3	.4	.3

Post-fire Habitat Conditions

Fire Severity

The following is a summary of the burning and habitat conditions resulting from the Jocko Lakes fire. All of the estimates of overstory mortality and fire severity were based on LANDSAT thematic mapping data (basal area (ba) mortality and RAVG respectively), whereas descriptions of understory conditions were based on field review and information provided in the EA vegetation report.

Low Severity - A low intensity ground fire is expected to result in tree mortality of up to 25 percent, with a patchy burn pattern. Burning typically occurs in surface fuels consuming the litter, herbaceous fuels, foliage and small twigs on woody undergrowth. The extent of understory cover in these areas varies greatly, with much of the understory vegetation (low growing shrubs and trees) being removed in some areas and some areas containing small pockets of relatively intact understory vegetation. While low severity fires may kill rhizomes or roots near the surface or stem buds that are not well protected, it has little effect on most buried plant parts and can stimulate significant amounts of post-fire sprouting. As a result these areas continue to provide forage for wildlife, with varying amounts of cover.

Moderate Severity– These areas resulted from patchy burning ground fires that generally consume the upper duff, understory plants and foliage on understory trees. Producing results characteristic of both high severity and low severity fires, this fire regime would be expected to result in 25-75 percent overstory mortality. These fires characteristically result in individual trees or groups of trees occasionally crowning

out. It is expected that few lodgepole pine, sub-alpine fir and Engelmann spruce would survive moderately burned areas. Although Douglas fir has thicker bark and is typically suited to better survive moderately severe burns, due to high amounts of leaf litter and dry conditions prior to the burn, it is expected that much of the Douglas fir would succumb to fire related mortality. Although some larch mortality is anticipated, in general, larch seems better able to survive some larch survival is anticipated in these areas.

Ground fuels are expected to be very heavy in the future in areas of higher mortality. Generally if these areas are surrounded by land that received a low severity burn, mortality is at the low end of the fire severity range and although much of the low woody vegetation may have been reduced, some mid-story cover continues to be available to provide marginal wildlife cover. If these areas are in close proximity to lands that received a high severity burn (60 percent of moderately burned), then ba mortality is often near 75 percent and most of the understory and mid-story have been killed. These areas no longer provide wildlife cover. Although moderately burned areas incinerate plant structures in the litter and upper duff layer, sprouting occurs from buds in deeper duff or soil layers, which frequently cause the greatest increase in stem numbers of root sprouting species and rhizomatous shrubs. So while these areas provide little cover, they are expected to greatly increase available forage within the next few years.

High Severity– These areas are characterized by a stand replacing fire that burns through the overstory and/or understory consuming large woody surface fuels and often the entire duff layer, causing mortality via crown scorch and root damage. This disturbance is expected to cause greater than 75 percent overstory mortality. Some small residual patches and stringers of unaffected areas may be present, as are scattered large diameter western larch and ponderosa pine which may survive. Ground fuels would be high in these areas in the future as large numbers of dead trees fall down. All understory and mid-story vegetation is removed and these areas have very open stand conditions and offer little wildlife cover. Due to the consumption of the duff layer herbaceous vegetation initially (1^{st} yr following the burn) occurs on less than 5 percent of the area and these areas currently provide little wildlife forage or cover. A severe fire, with total mortality or consumption of all live vegetation would set a forest habitat back to the grass/forb/conifer seedling stage of succession, or stand initiation stage (Oliver and Larsen 1996 *In* USDA-FS 2008). So these sites will provide forage in the near future, as well as cover in the form of DWD.

Table 5 displays by habitat group, the amount of the project area that experienced the different burning severity levels described above, whereas expected habitat changes are displayed in Table 6.

Table 5: Burning Severity within Habitat Groups

Mortality Class	Project Area Acres (NFS Lands)				Total Acres	Percent
	Openings	Habitat Groups 1, 2 and 3	Habitat Group 4	Habitat Group 5		
Unburned	<10	60	200	300	570	8%
Low (0-25%)	10	280	680	950	1,920	26%
Moderate (26-75%)	<10	180	600	740	1,530	21%
High (76-90%)	<10	510	1050	1770	3330	45%

Changes in Habitat

Table 6 displays the post fire conditions that result from burning severities identified in Table 5. The increase in seedling forest is due to the high severity burning conditions described above, whereas the increase in multi-structure habitat results form less severe burning conditions that often only result in

pockets of mortality (moderate and low). The large increase in seedling forest and 70 percent decrease in mature forest have greatly altered landscape and habitat conditions within the project area from what existed prior to the 2007 fire, and this change is expected to greatly affect wildlife distribution and use. Changes in understory conditions resulting from the burning conditions identified in Table 5 were discussed above under burning severity. Anticipated effects to wildlife from the Jocko Lakes fire are discussed in detail under the following discussion of deadwood and analysis of Management Indicator Species (MIS) and Threatened, Endangered and Sensitive (TES) species.

Table 6: Project Area Pre and Post Fire Conditions

Successional Stages	Pre-fire Conditions[a]	Post-fire Conditions[1]
Non-forest	<1%	<1%
Seedling	2%	46%
Brush Sapling	32%	12%
Pole	4%	2%
Multi-Structure	10%	25%
Mature	49%	15%

[a] - % of the project area

Environmental Consequences

Methodology

The methodology used for analysis of direct, indirect and cumulative effects is described above. Information used in the effects analysis includes pre-fire aerial photography, LANDSAT thermal imagery data, stand exams, Northern Region Vegetation Mapping Project (R1-VMP) data, field surveys and photos, data collected from project area field visits and post-fire surveys, and research literature including species and regional conservation assessments (See reference section). Because this assessment involves a multi-scale analysis, GIS coverage's and data sets for old growth, vegetation stand and landscape structural characteristics, past management activities, stream, riparian and aquatic data, forest-wide wildfire activity, district and forest wide wildlife observation data, and ecological landtype data were used to assess and predict anticipated effects.

Stand specific vegetative data and the availability of pre-fire snags was not available for approximately 40 percent of the project area and pre and post treatment conditions on these lands were based on interpretation of stands with similar forest conditions, habitat groups and disturbance history. While pre-fire stand conditions may differ from those predicted, all sites proposed for treatment were visited and the affected environment and effects are also based on post-fire habitat conditions that were validated on site. The Forest Vegetation Simulator (FVS) and the Fire and Fuels Extension (FFE) of FVS were used to simulate post-fire conditions including snags and down wood.

Project Design Features

All anticipated effects are based on implementation of the following wildlife project design features, as well as other resource design features identified in the EA. Table 7 identifies project specific PDFs related to wildlife and the estimated effectiveness of each design feature.

Table 7: Wildlife Project Design Features

Category	Project Design Feature	Estimated Effectiveness
Road and Corridor Design	To retain habitat for snag-dependent species and species dependent on large-diameter trees, the location of proposed roads, skid trails and cable corridors would ensure, whenever practical, that veteran and relic survivor trees and snags would not be removed during construction.	**Low to Moderate**; road location is determined to a large degree by FS road construction standards and the local terrain near the site to be accessed. Cost reduction is also an important consideration. It is likely that some veteran and relic survivor trees would be removed when locating new roads.
Skid Trail and Cable Corridor Design	To maintain habitat for snag-dependent species, the timber sale contract or contract administrator would ensure, whenever practical, that the design of skid trails and cable corridors avoid veteran and relic trees and snags	**Moderate**; the sale administrator has authority under timber sale contract provisions to approve all skid trail and cable corridor locations. However, there are many practical considerations in choosing these locations. Avoiding individual desirable trees is only one of those considerations. It cannot be expected that all veteran and relic trees would be protected by this measure.
Road Management (Wildlife security)	Existing roads which are currently restricted or closed and utilized for this project would be retained in their pre-project road status.	**High**; This would be implemented under the sale contract and by FS personnel following project completion. These treatments have been used effectively for many years and have a high likelihood of achieving desired objectives.
	Newly constructed short-term spec. roads would be closed to public access during and following implementation. All temporary roads would be closed to public access during implementation and decommissioned and re-seeded following project completion.	**High**; this is part of the proposed action and would be implemented under the sale contract and compliance monitoring, and post implementation by FS personnel. These treatments have been used effectively for many years and have a high likelihood of achieving desired objectives.
Road Management MIS (elk) & TES (Grizzly Bear)	The following gated roads access more remote portions of the project area (>1/4 mi. from an open road) and would be used during project implementation. In order to reduce elk vulnerability until hiding cover becomes re-established (@10 years), these roads would remain closed during the Montana big game season (rifle and archery) (16001-sec 26), (16655, 16687, 16688, 16727, 16729 – sec 31 & 32), (16898 & 17457 – sec 10), (16899 & 17455 – sec 20), (17544 – sec 2).	**Moderate to High**; this is part of the proposed action and would be implemented following project completion by FS personnel. Closing roads to public use is a standard practice although success can be reduced if illegal access occurs. As a result this has a moderate to high chance of avoiding or reducing road related impacts to elk, grizzly and other species sensitive to disturbance.

Category	Project Design Feature	Estimated Effectiveness
Snag Retention	Due to the importance of large diameter snags for wildlife, with the exception of trees near roads, trails or high use recreation sites, where public safety and facility protection is necessary, all trees greater than or equal to 21 inches dbh would be retained.	**Moderate/High**; these measures would be implemented using project layout, contract provisions and compliance monitoring and are standard practices used to help field crews identify appropriate trees to leave for wildlife habitat. It has been used successfully for many years and would have a moderate to high chance of avoiding and/or reducing adverse effects on snag dependent wildlife
	For dry sites (habitat groups 2 and 3 (VRU 2), retain a minimum of 4 snags per acre greater than or equal 20 inches dbh, or largest available. Select ponderosa pine, western larch and Douglas-fir in order of priority when available.	
	For moist sites (habitat group 4 (VRU 4), retain a minimum of 6 snags per acre greater than or equal to 10 inches dbh, with a minimum of 2 snags/acre greater than 20 inches dbh, or largest available. Up to 12 snags per acre would be desirable. Select ponderosa pine, western larch or Douglas-fir in order of priority when available.	
	For higher elevation moist sites (habitat group 4 (VRU 6) and habitat group 5), retain a minimum of 5 of the largest snags /acre, with a desire to have up to 10 per acre.	
	All treatment Units - In order to maximize potential wildlife use and/or help reduce windthrow, snags retained should be randomly distributed singly or retained in small clumps (generally 3-15 trees).	
Snag/DWD Retention	All treatment Units - Unless they pose a safety hazard, un-merchantable trees greater than 9 inches dbh would be left on site.	
Downed Wood Retention	On dry sites (habitat groups 2 and 3) retain 15-25 tons/acre downed woody debris. 6 inch + diameter is desirable.	
	On moist sites (habitat groups 4 and 5) retain 16 to 30 tons/acre downed woody debris. 6 inch + diameter is desirable.	
MIS (elk)	All Treatment Units - No harvest would occur within 150 feet of any elk wallow identified during project layout.	**Moderate**: While this would have a high likelihood of success in reducing impacts, some potential wallows could be missed depending on the time of year (wet conditions) during layout and marking and the overall effectiveness of this PDF is moderate.

Category	Project Design Feature	Estimated Effectiveness
TES (all species)	If any threatened, endangered, or sensitive species are located during project layout or implementation, a wildlife biologist would be notified. Management activities would be altered, if necessary, so that proper protection measures can be taken. Timber sale contract provisions that require the protection of Threatened, Endangered and Sensitive Species would be included in the timber sale contact.	**High**; These are part of the proposed action and would be implemented through contract provisions and compliance monitoring under the sale contract. They have been used from many years and have a high probability of avoiding or reducing adverse effects on the intended species(s).
TES (black backed woodpecker)	All harvest activity, (felling, yarding and skidding) is restricted from 4/1 - 6/30 across the entire project area. (Meaning operations may only occur between 7/1 and 3/31.).	
MIS (northern goshawk)	If a goshawk nest is established prior to or during implementation, a 40-acre no-activity buffer would be placed around each active to maintain site conditions. Additionally, if a goshawk nest is established, in order to minimize disturbance until fledglings are capable of flight, ground disturbing activities will be restricted (No activity between 4/15 and 8/15) within occupied fledgling areas.	

Alternatives Considered

This report analyzes the effects of two alternatives evaluated in the JLFS EA on wildlife including the No Action Alternative (Alternative 5) and the modified proposed action (Alternative 3). There are no federal activities proposed under Alternative 5 and federal activities proposed under Alternative 3 are displayed in Table 1. The following is a summary of the individual treatments proposed under Alternative 3, as well as a discussion of general effects on wildlife and wildlife habitat. Additional effects are described under the species specific analysis.

Proposed Action

Timber Harvest

Salvage harvest of dead and dying trees is proposed on 1648 acres or 22 percent of the project area. This treatment involves harvesting fire-killed trees, including trees that are currently dead as well as those that would not be expected to survive. More detailed information related to fire-killed trees is provided in the vegetation section of the JLFS EA and in the project vegetation report. All live trees would be retained and although some merchantable trees less than 9 inches may be harvested, most of the trees salvaged would include dead and dying trees between 9 and 20 inches dbh.

Site conditions following harvest vary greatly with the level of mortality and Table 8 summarizes the amount of anticipated overstory mortality within treatment units as whole, whereas Table 9 displays the level of fire severity within individual treatment units.

Table 8: Treatment Unit Mortality Summary

Overstory Mortality	Treatment Units (1648 acres total)	
	Acres	% of Total
>90%	798	49
75-90%	97	6
50-75%	128	8
25-50%	165	10
10-25%	122	7
0-10%	197	12
None	139	8

Table 9: Unit Fire Severity

Unit	Acres	Fire Severity				
		Severe	High Moderate	Low Moderate	Low	Unchanged
2-1	56	46	4	5	1	0
2-2	48	43	5	1	0	0
2-3	13	13	0	0	0	0
2-5	25	20	5	0	0	0
2-6	18	17	1	0	0	0
4-1	81	76	5	0	0	0
4-2	13	11	2	0	0	0
8-1	9	2	3	1	3	0
8-2	27	11	8	2	6	0
8-3	21	11	7	2	1	0
10-1	39	33	4	2	0	0
10-2	6	5	1	0	0	0
10-3	14	14	0	0	0	0
10-4	29	29	0	0	0	0
10-5	34	29	4	1	0	0
10-6	7	1	2	0	4	0
10-7	7	4	1	0	2	0
10-8	18	15	2	0	0	0
10-9	12	5	4	2	1	0
10-100	7	7	0	0	0	0
13-1	168	149	15	3	1	
14-1	8	0	1	3	4	0
20-1	30	20	9	0	1	0
20-12	9	0	0	3	4	1
20-15	13	13	0	0	0	0
20-2	21	5	6	3	8	0
22-1	47	3	9	19	16	0
22-2	7	0	0	0	6	1
22-22	4	4	0	0	0	0
22-3	11	0	1	5	5	0
22-5	16	4	9	0	3	0
22-6	48	6	14	13	15	0
22-7	48	8	18	6	16	0
26-1	34	9	14	4	7	0
26-2	105	59	22		22	2
26-4	18	0	1	0	2	15
26-5	13	4	5	1	3	0
26-6	10	0	2	0	6	2
26-7	32	24	8	0	0	0
28-1	49	15	14	12	8	0
28-2	28	5	12	3	8	0
28-3	7	0	0	1	5	1
28-4	38	9	10	1	8	10
29-1	16	7	5	2	2	0
29-2	12	2	4	3	3	0
29-4	1	1	0	0	0	0
31-1	18	0	0	8	9	1
31-3	29	14	4	1	5	5
31-4	9	1	2	0	5	1
32-1	33	0	3	5	8	17
32-2	15	8	6	0	1	0
32-3	11	1	7	0	2	1
34-1	119	29	12	16	59	3
34-2	56	0	0	7	6	43
36-1	21	1	5	5	10	0
36-2	33	5	6	4	17	1
36-3	25	6	4	7	8	0
Total Acres	**1646**	**804**	**286**	**151**	**301**	**104**
% of Total		**0.49**	**0.17**	**0.09**	**0.18**	**0.06**

Approximately 70 percent of the treatment units have lost more than half of the overstory, with 55 percent of the sites experiencing overstory mortality in excess of 75 percent. Salvage harvest on these sites would remove most of the dead trees between 9 and 20 inches dbh. Due to the intense burning that occurred on these sites all understory vegetation has been removed and these areas are currently very open. Additionally there is very little herbaceous vegetation re-establishing on the most severely burned sites due to the loss of the duff layer and scorching of the soil. As a result these areas presently provide very little wildlife food and cover. While it would take decades for overhead cover to become re-established on these sites, cover in the form of downed woody debris would greatly increase both in the short and long term as remaining dead trees fall down (See Table 11). Additionally due to increased light conditions, available forage would increase both in the short and long term, attracting many species of birds and mammals to these areas (Smith 2000).

Approximately one-third of the units experienced overstory mortality of approximately 25 percent. While salvage in these areas would remove pockets of medium to large diameter (9 to 20 inch dbh) dead and dying trees, a live overstory would continue to predominate across these areas. Also while salvage occurs across most of the sites that were intensively burned, harvest in these less severely burned areas would be interspersed with areas of remaining cover that are un-harvested. Because the intensity of burning within these areas was less severe, herbaceous cover is currently fairly widespread (50-75 percent) in these units and some of these areas contain pockets of understory woody vegetation. As a result these areas would continue to provide some wildlife food and cover.

The type and amount of each logging system used as well as the season of harvest are displayed in Table 10. In order to minimize potential effects to soils, approximately 95 percent of the treatment units would involve winter tractor logging. Additionally unless surveys for the BBW are conducted prior to harvest (see design features), all salvage is restricted to the non-nesting period for this species (no harvest between 4/1 and 6/30). Tractor logging would be completed with a rubber tired skidder and to provide adequate woody debris, only merchantable logs will be taken to the landing. In-woods processors will be used for ground based harvests and all tops and limbs will remain on-site. Skyline yarding involves the clearing of skyline corridors approximately 15 feet wide and 150 feet apart, although the distance between corridors would vary depending on mortality. Removal of timber would also include construction of 128 landings, which would involve clearing of trees on between ¼ and ½ acre. Effects of this activity would include removal of trees on up to approximately 60 acres at scattered locations across the project area. All landings would be seeded with grasses and forbs immediately following use. While seeding of landings and areas with potential for soil movement is expected to reduce erosion, it would also hinder natural process and reduce natural regeneration on the area affected.

Table 10: Logging System Summary

Logging System	Winter	Summer
Tractor	1580	21
Skyline Yarding	0	56

Effects of logging on wildlife include possible direct mortality. Although due to the large amount of winter logging and BBW seasonal restrictions, all harvesting would occur outside the breeding season (for most bird and mammal species) when young of the year are not present. As a result it is anticipated that potential mortality would be reduced. Additionally the LNF is a partner in the North American Bird Conservation Initiative and in compliance with Executive Order 13186-Responsibilities of Federal Agencies to Protect Migratory Birds.

The need to preserve large legacy trees, provide habitat for cavity nesting wildlife and maintain levels dead wood necessary to meet various resource objectives was recognized early in the planning process and project design features require; 1) Unless they pose a safety hazard, all dead trees 21 inches in diameter (dbh) or larger would be retained, 2) that all treatment areas retain levels of medium (10 to 19.9 inch) to large (>=20 inch) diameter snags necessary to provide habitat for cavity nesting wildlife and 3) that all units retain levels of downed woody debris necessary to protect soils and regenerating trees and meet the needs of wildlife that prefer or require this habitat component. Also project level design features meet or exceed snag and downed woody debris recommendations in the Forest Plan (USDA-FS 1986 Appendix N), the Lolo NF Downed Wood Guideline (USDA-FS 2006) and the Northern Region Snag Management Protocol (USDA-FS 2000a).

Reforestation Activities

The Jocko Lakes fire has reduced the presence of western larch and ponderosa pine by approximately 45 percent, while creating an environment for their re-establishment. Because many of the ponderosa pine sites are understocked and because it likely that western larch sites would regenerate to Douglas fir or lodgepole pine, a total of 1,056 acres of supplemental planting are proposed. Potential adverse effects of this treatment include short term (a few days) behavioral avoidance during planting. However because this treatment would help to ensure that western larch and ponderosa pine are re-established and considering the importance of these two species to wildlife (Montana PIF 2000), proposed planting is expected to provide long-term benefits to wildlife.

Transportation Activities

Roads can provide wildlife habitat and/or adversely affect wildlife distribution and use, as well as directly affect terrestrial species habitat by altering the physical habitat conditions through establishment of a roadbed. Effects can be both positive and negative. Negative effects can occur if the species or its habitat is displaced by the road. Many species are sensitive to human disturbance and adverse effects from a road may occur due to increased traffic use or if new access is provided into an area that is presently un-roaded. Positive effects may result for species that utilize the herbaceous Right-of-Way (ROW) associated with roads, or in the case of low standard roads such as those proposed, the roadbed itself.

The status of the present road system within the project area, including identification of roads where there are wildlife related concerns is presented in the project Roads Analysis Project (RAP) report. Road activities including temporary and spec road construction, road decommissioning and storage, and road maintenance/management are identified in Table 1 and Table 3. The following is a discussion of general road related effects on wildlife.

Temporary and Short-term Spec. Road Construction - Direct effects are limited to activities that occur to the roadbed and the proposed ROW. These treatments involve clearing a 20 foot ROW within existing forest and approximately 10 acres of forested habitat would be converted to non-forest. It may also include shaping, adding culverts, improving drainage, and applying surfacing material. The effects also include a short term increase in sediment, as well as possible mortality to less mobile wildlife and behavioral avoidance of mobile wildlife species during construction. Although road construction can occur at any time of year, timber harvest associated with clearing of the ROW would be restricted to the BBW non-nesting period. In addition new road construction has the potential to increase fragmentation, which is discussed in more detail under the Northern goshawk section of this report.

Road Maintenance: Road maintenance would occur on approximately 63 miles of existing system road and includes shaping the roadbed, adding culverts and/or applying surfacing material. Like above road construction, this activity is expected to result in increased sedimentation during construction, although

implementation of project design features and Best Management Practices (BMP) would reduce these impacts.

Road Decommissioning and Storage: These treatments are proposed on 3.5 and 5.2 miles of Forest Service system road respectively. Additionally there is another two miles of roads that would be closed, although it has not yet been determined whether or not they would be decommissioned or stored. Both treatments involve ripping and seeding the roadbed to re-establish vegetation, installing water-bars and out-sloping the old roadbed to facilitate drainage, re-storing all watercourses to natural channels and scattering slash on the old roadbed. While it is anticipated that roads receiving these treatments would not be used for at least 20 years, roads that are decommissioned are removed from the FS System, whereas storage roads are maintained on the system in a closed status. Potential effects to wildlife include short-term sedimentation and possibly some direct mortality to less mobile species during construction. However implementation of project design features would be expected to reduce potential impacts (described above). Because these treatments would involve the long-term reduction in road miles and human access, including a reduction in open road density, it is anticipated that these activities would result in a long-term improvement to wildlife habitat for species that are sensitive to disturbance and/or species that are adversely affected by human contact. This is discussed in more detail under the gray wolf, northern goshawk and elk sections.

Road Management: Many effects to wildlife are determined by road management, or whether a road is open, closed or restricted. The Lolo NF reduces impacts to wildlife by keeping roads into key habitats closed or restricted during critical periods of the year. In addition project design features require that all roads used by the project which are currently closed or restricted to meet wildlife or other resource objectives be maintained in their pre-project status. In order to reduce disturbance related impacts to wildlife all new roads (temporary and short-tem spec roads) would be closed to public access during and following implementation.

Road management also affects big game harvest. Because elk hiding cover has been greatly reduced and in order to reduce hunter related mortality, approximately four miles of existing road into more remote habitat within the project area (lands > ¼ mile from an open road) would be closed to hunter access for approximately 10 years, or until adequate cover becomes re-established.

Noxious Weed Treatments

Noxious weed treatments are proposed along existing roads, as well as in areas that have been opened up such as skid trails and landings. This treatment involves ground based application of herbicides to reduce the spread of Non-Native Invasive Species (NNIS). Effects of this treatment include a remote possibility of mortality/disturbance during implementation, as well as possible long-term benefits due to a reduction in NNIS. More information related to the target species and control methods are discussed in the JLFS EA, as well as in the recent weeds EIS.

Dead Wood

In order to assess effects of the 2007 fire on the availability of dead wood, burning was simulated at three different fire severities including very high (90 percent ba mortality), high (76-90 percent mortality) and mixed (26 -75 percent ba mortality), from which post-fire (2008) and future (2012 & 2022) levels of snags and DWD were predicted. This information is displayed in Table 11.

The information presented in Table 11 was based on pre-fire data from stands that occur outside of proposed salvage areas. Because current inventory data is not available for all stands within the project area, this information is based on a sub-set of stands where fsveg data was available. Also the values

identified in Table 11 are based on the compiled average for all stands within each category. Information is presented in this way so that changes over time can be assessed and to better display snag and DWD differences between burning severities. However it should be noted that actual site conditions would vary greatly, with some stands containing few if any snags and other sites greatly exceeding values identified in Table 11.

Table 11: Post-fire Snag and Downed Woody Debris Availability

Year	Snags (Trees/acre)				DWD (Tons/acre)			
	5-9.9"	10-15.9"	16-20.9"	>=21"	< 3"	>3"	>6"	Total
Habitat Groups 1-3 (1030 acres)								
Very High								
2008	79	60	13	7	2.2	5.8	4.3	12.3
2012	21	36	11.6	6.3	6.9	15.8	11.6	34.3
2022	<1	15	7.3	4.7	3.6	25.3	19.9	48.8
High								
2008	77	55	11.3	5.9	2.1	5.5	4.1	11.7
2012	20.6	32.4	9.9	5.3	6.5	14.4	10.6	31.5
2022	<1	13.9	6.2	4	3.5	22.9	17.9	44.3
Mixed								
2008	44.5	20.8	3.6	1.9	1.7	4	2.8	8.5
2012	12.5	12.1	3.2	1.7	3.7	7.9	5.4	17
2022	1.6	5.9	2.1	1.4	2.3	10.9	8	21.2
Habitat Group 4 (2530 acres)								
Very High								
2008	121	57.9	11.9	4.9	2.4	8.1	5.9	16.4
2012	32.3	30.6	10.3	4.5	7.3	20.2	14.3	41.8
2022	<1	10.9	6.1	3.4	3.5	29.3	22.1	54.9
High								
2008	118	53.2	10.5	4.1	2.4	7.8	5.7	15.9
2012	31.5	28	9	3.8	7.1	18.9	13.3	39.3
2022	<1	9.8	5.4	2.9	3.4	27.1	20.2	50.7
Mixed								
2008	74.4	29.6	5.2	1.8	2.2	7.1	4.9	14.2
2012	20.7	15.3	4.5	1.7	5.2	13.6	9.2	28
2022	2	6	2.8	1.3	2.9	17.8	12.7	33.4
Habitat Group 5 (3,760 acres)								
Very High								
2008	141.5	200	65.4	9.7	5	10.9	14.6	30.5
2012	37.7	29.2	6	2.5	6.8	21.3	14.5	42.6
2022	<1	9.8	3.6	1.9	3.2	28.1	20	51.3
High								
2008	137.2	53.6	5.9	2.3	2.3	8.2	5.8	16.3
2012	36.7	26.6	5.1	2.1	6.6	20.1	13.6	40.3
2022	<1	9	3.1	1.6	3.1	26.1	18.4	47.6
Mixed								
2008	84.9	29.4	2.5	0.9	2.1	7.3	4.9	14.3
2012	23.7	14.2	2.2	0.8	4.8	14.2	9.3	28.3
2022	2.7	5.4	1.4	0.6	2.6	17.1	11.6	31.3

Effects Common to Both Alternatives

A comparison of information presented in Table 11, with pre-fire levels of snags displayed in Table 6 shows that levels of snags and DWD would greatly increase over the next 14 years within all habitat groups. However the size of available snags would vary greatly by habitat group and fire severity.

When evaluating potential effects to wildlife, both snag availability and fire severity need to be considered. For example, although areas that burned severely contain higher numbers of snags, because these areas experienced over 75 percent overstory mortality, they would no longer provide suitable habitat for cavity nesting species that require a live canopy component. So mixed severity areas would be expected to provide more desirable habitat for species such as the pileated woodpecker, which require large diameter snags (>16 inches dbh) within a relatively closed canopy for nesting. However because this species forages in stands with as little as 10 percent live overstory, foraging habitat would occur across all fire severities. This is discussed in more detail under species specific analysis.

Because of the large influx of snags immediately following the fire (2008 in Table 11), habitat would be improved for fire dependent species such as the BBW, as well as a variety of cavity nesting species. Also because this species prefers large numbers of medium and large diameter snags, areas that were more severely burned would provide preferred habitat for this species, as well as other wildlife species that utilize these conditions.

As can be seen from Table 11, the distribution of DWD would be highly variable across landscape. Also like snags, levels of DWD would vary over time, except that DWD would continue to increase over the next 14 years, whereas snags would decrease during this same time period. Effects of proposed treatments on snags and DWD would also be evaluated by looking at changes in habitat conditions for the pileated woodpecker, which is the Forest MIS used to assess habitat for cavity nesting species and species that require downed woody debris.

Although proposed salvage would decrease snag and DWD (described below), over 85 percent of the project area would be left un-treated under both alternatives. So a wide range of habitat conditions and snag densities for species that prefer or require dead wood would be provided under both alternatives. Also this is consistent with management recommendations within post-fire landscapes (Saab and Dudley 1998, Saab et al 2002), that a diversity of conditions be maintained.

Alternative 3 Effects

A total of 1648 acres would be salvaged under this alternative and proposed harvest would reduce the availability of snags and DWD on the sites treated. However with implementation of project design features, all sites proposed for treatment would meet or exceed levels of snags and DWD recommended in the Forest Plan (USDA-FS 1986, the Lolo NF Downed Wood Guide (USDA-FS 2006) and the Region 1 Snag Management Protocol, USDA-FS 2000a). So while habitat quality for some species dependent on dead wood would be reduced, proposed salvage sites would continue to provide snags and DWD habitat.

Species Evaluated

Species Eliminated From Detailed Study

Species considered in this analysis include species listed as federally threatened, endangered, or candidate on the LNF (USDI-FWS 2007), Forest Service sensitive species (USDA-FS 2005) and MIS species

identified in the Forest Plan (USDA-FS 1986). In order to determine the scope of analysis, a preliminary evaluation (Step 3 above) was conducted for each potentially affected wildlife species and Table 12 identifies those species that were considered, but would not be evaluated in detail in the analysis. Specific rationale for their elimination from detailed study and the viability determination for each species is also provided in Table 12, whereas species habitat information for these species can be found in Appendix A.

Table 12: Sensitive Species Eliminated from Detailed Study

Species	Rationale for Elimination From Detailed Study	Viability Determination
Peregrine Falcon	The project area lacks suitable nest habitat (cliff) and due to the distance to the nearest nest, the project area is not utilized for foraging. As a result this species would not be affected by proposed activities.	No Impact
Harlequin Duck	Streams within the project area are not large enough or lack structural habitat features to provide suitable breeding habitat and this species would not be affected by proposed activities.	No Impact
Townsends Big-eared Bat	The project area lacks suitable roost habitat (caves/mines) and this species would not be affected by proposed activities.	No Impact
Common Loon	There are no loon breeding lakes within the project area as determined by annual surveys. Further, lakes such as Hidden Lake would be buffered with 300 foot No Activity areas. As such, this species would not be affected by proposed activities.	No Impact
Northern Leopard Frog	The Seeley Lake R.D. is considered outside the currant range of this species.	No Impact
Coeur d'Alene Salamander	The project area is outside the range of this species.	No Impact

Wildlife Issues Addressed

Potential wildlife related issues identified during scoping included reducing impacts to species with viability concerns (TES), cavity nesting and old growth species, maintaining species viability, and potential impacts to elk. Although none of these issues were used to develop alternatives (See chapter 2 of the JLFS EA), project design features identified above were added in response to wildlife related concerns identified during scoping. Additionally all potential effects identified during scoping will be addressed in the environmental effects section of this report. Table 13 lists the issue indicators that have been identified to measure potential impacts to wildlife from the alternatives considered in the JLFS EA.

Table 13: Issue Indicators Used to Determine Wildlife Effects

Species	Indicator
Management Indicator Species	
Pileated Woodpecker	Changes in the amount and quality of foraging and nesting habitat and changes in project area distribution and use.
	Changes in old growth and standing and downed woody debris
Northern Goshawk	Changes in nesting, foraging and post-fledgling habitat and changes in project area distribution and use.
Elk	Changes in the amount and quality of cover, forage and security habitat and changes in project area distribution and use.
Threatened and Endangered Species	
Lynx	Effects to individuals and habitat suitability changes within the Placid and Boles Lynx Analysis Unit (LAU).
Grizzly Bear	Effects to individuals and changes in security cover and potential conflicts with humans.
Gray Wolf	Changes in big game, effects to denning or rendezvous sites, effects to livestock permits.
Sensitive Species	
Bald Eagle	Effects to individuals and changes in the amount and quality of nest and foraging habitat.
Black-backed Woodpecker	Effects to individuals and changes in the amount and quality and distribution of suitable snag habitat.
Wolverine	Effects to individuals and changes in the amount and quality of den and foraging habitat and changes in human access.
Fisher	Effects to individuals, changes in the amount and quality of den and foraging habitat.
Boreal Toad	Effects to individuals and changes in the amount and quality of breeding and upland habitat.
Flammulated Owl	Effects to individuals and changes in the amount and quality of suitable late structural forest conditions.
Northern Bog Lemming	Effects to individuals and changes in suitable riparian and wet meadow habitat.

As described earlier, wildlife analyzed include all MIS species identified by the Lolo Forest Plan and species with potential viability concerns, or TES species that have documentation and/or suitable habitat within the JLFS project area (See Table 14). The following is a discussion of the preferred habitat, historical condition and existing condition within the project area for each of these species. More detailed information on Federally Threatened and Endangered species can be found in the Biological Assessment.

Species Evaluated in Detail

Table 14 identifies wildlife species evaluated in detail and summarizes their preferred habitat and project status.

Table 14: Species Considered In Detail

Common Name	Scientific Name	Forest Status	Preferred Habitat	Project Status
Grizzly Bear	*Ursus Arctos*	Threatened	Alpine/subalpine coniferous forest, lower elevation riparian areas in spring, lack of human disturbance.	Preferred habitat limited largely to riparian areas. Although some summer use is known to occur.
Canada Lynx	*Lynx canadensis*	Threatened	Subalpine fir habitat types (including cover types with pure or mixed subalpine fir, lodgepole pine, Douglas-fir, grand fir, western larch, and hardwoods) from 4,000 to 7,000 feet in elevation, vertical structural diversity in the under story (such as downed logs, seedling/saplings, shrubs, forbs) for denning and abundant snowshoe hare prey for foraging	Portions of both the Placid and Boles Lynx Analysis Units (LAU) occur within the project area and use was documented prior to the 2007 fire. Suitable habitat has been greatly reduced due to the Jocko Lakes fire and current use of the area is unknown.
Northern Rocky Mountain Gray Wolf	*Canis lupus irremotus*	Endangered	Habitat generalist preferring remote areas away from human disturbance. Requires adequate populations of big game, preferably elk.	There are no known wolf den or rendezvous sites. Suitable foraging habitat is present and occasional wolf use occurs. There are no livestock grazing permits on FS lands within the project area and no known livestock grazing occurs on adjacent DNRC or PCTC lands.
Fisher	*Martes pennanti*	Sensitive	Moist mixed coniferous forest types (including mature and old growth spruce/fir at low to mid elevations, riparian/forest ecotones, secure denning habitat.	Unburned and lightly burned portions of the project area may continue to provide suitable foraging, den and dispersal habitat. However 70% of recently burned areas are generally considered unsuitable.
Wolverine	*Gulo gulo*	Sensitive	Large areas of un-roaded security habitat; secure denning habitat (generally at the base of glacial cirque basins), utilize ungulate carrion in winter.	The project area does not provide high quality den habitat, based on limited scientific data about this species. Unburned portions of the project area may be utilized when traveling to higher quality habitat or for foraging.
Northern bog lemming	*Synaptomys borealis*	Sensitive	Wet riparian sedge meadows, bog fens.	No documented occurrence. The project area contains approximately 70 acres of preferred wet meadow/wetland habitat. Fire caused the loss of riparian cover in many areas.
Bald eagle	*Haliaeetus leucocephalu*	Sensitive	Nests near an open water body (> 80 acres) or major river system; available fish and water bird species prey, secure nesting habitat.	The closest known nest is two miles from the project area. Although portions of the project area provide foraging habitat, due to the distance to the nearest large body of water and large amount of moderate to severely burned lands, the project area does not provide suitable nest habitat.

Common Name	Scientific Name	Forest Status	Preferred Habitat	Project Status
Black-backed woodpecker	*Picoides arcticus*	Sensitive	Requires an abundance of snags and wood boring beetles. Typically post-fire coniferous forest.	Habitat is abundant in moderately to severely burned areas (70% of the project area). Project area assumed to be occupied.
Flammulated owl	*Otus flammeolus*	Sensitive	Mature (> 9 inches dbh) and old growth ponderosa pine/Douglas-fir with abundant prey (moths). Secure nesting habitat with >35% canopy closure.	No documented occurrence. Large diameter single story ponderosa pine or Douglas-fir stands with an open understory are rare. Old growth Douglas fir exists on 72 acres and would remain un-treated.
Western toad	*Bufo boreas*	Sensitive	Adults occur in a variety of uplands; breeds in shallow ponds, lakes, wetlands, slow moving streams and roadside ditches.	Breeding habitat occurs in wetlands, swamps slow streams and ditches, and upland habitat throughout the project area. Fire caused the loss of riparian cover in many areas.
Northern goshawk	*Accipiter gentilis*	Mature forest MIS	Nests in large diameter stands (>10 inch average dbh) below 6,200 ft. with greater than 40% canopy closure. Foraging habitat is variable but typically in mature stands with dense canopies fairly open understories	The closest known goshawk nest is approximately six miles east of the project area. Goshawk foraging was documented prior to the 2007 fire. Approximately 75% of the area no longer suitable nesting habitat.
Pileated woodpecker	*Dryocopus pileatus*	Old Growth/Snag MIS	Moderately warm, dry Douglas-fir/Ponderosa; moderately cool, dry Douglas-fir; moist mid-elevation spruce/grand fir. Large, soft snags (> 21 “dbh).	Suitable large diameter snag habitat occurs at scattered locations across the project area. Foraging habitat is widespread.
Elk	*Cervus canadensis*	Commonly Hunted MIS	Habitat generalist, secure habitat during the hunting season, undisturbed (human) winter range.	Primarily spring and summer use, although the southeast portion of the project area adjoins winter range. Hiding and thermal cover greatly reduced by the 2007 fire. The fire has increased foraging habitat, which is widespread.

THREATENED AND ENDANGERED SPECIES

The existing condition and anticipated effects to federally listed Threatened and Endangered Species is provided in this section. More detailed information on these species can be found in the JLFS project Biological Assessment (BA).

Canada lynx (Threatened)

Population Distribution and Habitat Status

The population distribution, life history, habitat status and recovery objectives for Canada lynx in R1 are detailed in Ruggiero et al. (1999), Ruediger et al. (2000), USDA-FS (2001, 2005, 2007c), and USDI-FWS (2007).

The range of the Canada lynx is the Northern Taiga. In the conterminous U.S., lynx range has typically been depicted as marginal or peninsular extensions of the Northern Taiga into the western mountains, Great Lakes and Northeast. These regions represent southern extensions of boreal forest in the lower 48 states. Prior to listing, lynx distribution in Montana and other western states was based on historical data and trapping records. Following listing, a national lynx survey was conducted and the results indicated that lynx were less common than historic records indicated. Intensive track surveys conducted by the Rocky Mountain Research Station across western Montana have shown that lynx are uncommon to absent in many parts of this region with the Yaak and the Clearwater valley near Seeley Lake being the primary strongholds for lynx in Montana (Squires, Lynx Research Progress Report, 2006).

In 2006, the FWS classified the LNF as occupied/core lynx habitat due to strong recent and long-term evidence of lynx reproduction. About 53 percent of the LNF is comprised of mapped lynx habitat (1,110,000 of 2,082,784 acres) indicating potential habitat for the species is abundant and well distributed.

The Rocky Mountain Research Station has been studying winter and summer habitat use patterns of lynx on the LNF since 1998. Results indicate that, in winter lynx preferentially forage in spruce-fir forests with high horizontal cover, abundant hares, deep snow conditions, and large-diameter trees (Squires et al. 2006). A review of Forest Inventory and Analysis (FIA) data for the LNF shows old growth estimates for the three primary lynx habitats (old growth habitat types 4, 5, and 6) are 13.39 percent (90 percent CI 9.81 to 17.19), 7.76 percent (90 percent CI 3.26 to 12.98 percent), and 22.07 percent (90 percent CI 11.85 to 33.10), respectively, indicating areas of high structural diversity to support lynx denning and lynx foraging habitat are well represented. In summer, Squires et al. (2006) found that lynx will expand habitat use to include young, regenerating forests. Based on this research, quality lynx foraging habitat is not confined to young stands as was once believed. However, young stands with high structural complexity do provide quality foraging habitat for lynx (see Lynx Amendment, 2007).

Mortality causes (n = 49) in order of frequency include: predation by mountain lions primarily in spring/fall (31 percent), starvation primarily in winter (29 percent), unknown factors (22 percent), and trapping/shooting (18 percent) (*Ibid.*). Current research on the LNF is focused on collecting data that could provide the basis for modeling how forest management should be configured on the landscape in ways that provide sustainable lynx habitat, both spatially and temporally, in a multi-use context. Results, of that research should be available in 2008.

The project area and effected LAUs are best described as checkerboard ownership, with a combination of NFS lands, PCTC, State of Montana, Confederated Salish and Kootenai Tribes of the Flathead Reservation (CSKT), and Private. Table 15 displays the Lynx Analysis Units (LAUs) that are within the Jocko Lake Salvage Project Area along with the expected lynx activity, elevation, and likely occupancy by lynx.

Table 15: Canada Lynx; Population and Habitat Status in the Analysis Area

Lynx Analysis Unit (LAU)	Canada Lynx Activity	Project within Lynx Elevation	Occupied Lynx Habitat
Placid	Unknown currently due to large-scale wildfires – Historically Yes	Yes	Unknown – prior to Jocko Lake Fire Yes, but questionable now.
Boles	Unknown currently due to large-scale wildfires – Historically Yes	Yes	Unknown – prior to Jocko Lake Fire Yes, but questionable now.

The best available queriable information (course filtered data) was used to assess the existing condition of lynx habitat throughout the two effected LAUs and is summarized in Table 16. It is important to note that this information being displayed is likely the best case scenario numbers, as much of the area currently identified as potentially suited is clearly not, when compared to recent aerial photos. There are large blocks of unsuitable habitat in both LAUs from recent wildfire activities (Jocko Lake and Boles Meadow Fires) as well as timber harvest throughout much of the PCTC owned lands. These currently unsuited areas will likely return to suitable habitat in about 15 years.

For sight specific (fine filter) information, on the ground review was conducted in 2008 focusing on proposed harvest units and concentrated on the areas most likely to still maintain suitable foraging or mature multi-storied foraging habitat. All of the reviewed areas identified as having RAVG Low Severity rating displayed that most if not all understory trees of all species (less than 2 inches DBH) did not survive through this growing season and therefore would not provide suitable lynx habitat at this point in time. GPS points and photos of these portions of stands were taken as well and are in the project record. As a result of the Jocko Lake Fire, it is likely that none of the areas mapped out as low, moderate, or high intensity continue to provide suitable foraging or mature multi-storied lynx foraging habitat, nor will they for the next 14 or more years. Some small areas remained unaffected by the Jocko Lake Fire and continue to provide small patches of small trees, or contain some understory structure, but not in sufficient quantities to qualify as suitable lynx habitat. Therefore, the likelihood of either LAU being capable of providing a suitable home range at this time for lynx is very questionable. To the west of the JLFS project area, the South Fork Jocko Tribal Primitive Area continues to provide high quality lynx habitat.

Table 16: Current Lynx Habitat Suitability Using a Course Filter

Category	Placid LAU	Boles LAU
Potentially Suited Habitat [a]	9,563 Ac (27%)	12,341 Ac (59%)
Likely Unsuited Habitat	22,461 Ac (63%)	6,089 Ac (29%)
Unclassified Habitat	3,727 Ac (10%)	2,408 Ac (12%)
Ownership		
Lolo NF (NFS lands)	11,190 Ac (31%)	8,463 Ac (41%)
PCTC	23,258 Ac (65%)	10,801 Ac (52%)
MT State	1,063 Ac (3%)	1,072 Ac (5%)
CSKT	0 Ac (0%)	441 Ac (2%)
Private	154 Ac (<1%)	5 Ac (<1%)

[1] These acres are listed as potentially suited, because the base layer used to establish areas in which existing habitat was suitable was large-scale and may have been out of date. Recent aerial photos clearly show substantially reduced conifer canopies than would be expected to be seen on currently suitable lynx habitat. Many of these areas in question are within privately owned (corporate) lands.

Environmental Consequences

The analysis of effects to lynx and their habitat will concentrate on whether or not the proposed activities would violate any of the objectives, standards or guidelines within the Lynx Amendment, because the

Jocko Lake Fire resulted in changed condition of no suitable lynx habitat remaining within the proposed units, if not on a much larger scale. Therefore, none of the proposed activities would change any existing suitable lynx habitat into unsuited. Tables 17 and 18 review all relevant objectives, standards and guidelines in detail.

Table 17: Lynx Amendment – Review of Applicable Objectives

Objectives	Pre-Treatment Compliance	Post-Treatment Compliance
ALL O1 – Maintain or restore lynx habitat connectivity in and between LAUs and in linkage areas	27 percent of the Placid LAU may provide suitable lynx habitat 59 percent of the Boles LAU may provide suitable lynx habitat (see Table 16 for full disclosure of this). The recent wildfires (Jocko Lake and Boles Meadows) resulted in large blocks of area that do not currently provide suitable lynx habitat.	The proposed activities would not reduce the existing suitable lynx habitat within either LAU or decrease the future ability to provide suitable lynx habitat. As a result of salvage harvest, about 1,056 acres are likely to recover sooner due to replanting.
VEG 01 – Manage vegetation to mimic or approximate natural succession and disturbance processes while maintaining habitat components necessary for the conservation of lynx.	The recent wildfires (Jocko Lake and Boles Meadow Fires) changed the majority of lynx habitat within the Placid LAU and a substantial portion of the Boles LAU in the last five years. Although natural, the wildfires affected larger areas than would normally be expected as a result of drought conditions that existed at the time of the fires, in addition to past successful suppression activities.	The proposed activities would not change any existing suitable lynx habitat into unsuited.
VEGO2 – Provide a mosaic of habitat conditions through time that support dense horizontal cover and high densities of snowshoe hares. Provide winter snowshoe hare habitat in both the stand initiation structural stage and in mature, multi-story conifer vegetation.	Due to the recent wildfire activities (Jocko Lake and Boles Meadow Fires), the majority of the Placid and a substantial portion of the Boles LAUs will provide an abundance of young conifer vegetation suitable for snowshoe hares in future years.	The proposed activities would likely speed up restoration of suitable lynx habitat by replanting areas that would otherwise take much longer or not regenerate conifer vegetation on their own at all.
VEGO3 – Conduct fire use activities to restore ecological processes and maintain or improve lynx habitat.	Recent wildfire has substantially affected the majority of the Placid LAU and a substantial portion of the Boles LAU, including the Boles Meadow Fire in 2003.	No additional burning, other than activity fuels (slash piles at landings and skyline corridors), would be expected as a result of any proposed activities.
VEGO4 – Focus vegetation management in areas that have potential to improve winter snowshoe hare habitat but presently have poorly developed understories that lack dense horizontal cover.	97% of the JLFS project area was changed by the Jocko Lake Fire. Most, if not all, of this area is lacking suitable winter snowshoe hare habitat that with little horizontal cover.	The proposed activities would limit future horizontal structure on about 14% of the JLFS project area, but the proposed replanting activities would likely speed up recovery of understories that provide dense cover.
Objective HU01 – Maintain the lynx's natural competitive advantage over other predators in deep snow by discouraging the expansion of snow compacting activities in lynx habitat.	Existing snow compacting activities are primarily associated with roads. However, due to the recent wildfires, much more of the Placid and Boles LAUs could be accessed as a result of open understories and complete lack of overstories.	The proposed activities would decrease the number of stems per acre that are currently vertical. However, this reduction is not expected in result in an increase of over the snow activities in areas with remaining green vegetation.
HU 05 – Manage human activities – such as exploring and developing minerals and oil and gas, placing utility corridors and permitting special uses – to reduce impacts on lynx and lynx habitat.	No such human activities currently occur within the project area.	This project would not result in a substantial increase in human activities, other than work related to the removal of dead material, road maintenance, construction, and decommissioning, and replanting activities.

Objectives	Pre-Treatment Compliance	Post-Treatment Compliance
HU 06 – Reduce adverse highway effects on lynx by working cooperatively with other agencies to provide for lynx movement and habitat connectivity and to reduce the potential of lynx mortality.	Lolo National Forest is involved is these interagency relationships.	Lolo National Forest will continue to be involved in interagency relationships.
LINK 01 – In areas of intermingled land ownership, work with landowners to pursue conservation easements, habitat conservations plans, land exchanges or other solutions to reduce the potential of adverse impacts on lynx and lynx habitat.	The LNF is currently involved in these types of activities and exchanges.	The LNF will continue to be involved in such activities. However, this project would not involve any of these activities and would be well outside the purpose and need.

Table 18: Applicable Lynx Management Standards and Guidelines; Conservation Measures to Address Risk Factors Affecting Lynx Productivity (Northern Rockies Lynx Management Direction, 2007)

Standards and Guidelines	Pre-Treatment Compliance	Post-Treatment Compliance
Standards		
All S1 – New or expanded permanent developments and vegetation management projects must maintain habitat connectivity in an LAU and/or linkage area.	27 percent of the Placid LAU may provide suitable lynx habitat 59 percent of the Boles LAU may provide suitable lynx habitat (see Table 5 for full disclosure of this). The recent wildfires (Jocko Lake and Boles Meadows) resulted in large blocks of area that do not currently provide suitable lynx habitat.	The proposed activities would not reduce the existing suitable lynx habitat within either LAU or decrease the future ability to provide suitable lynx habitats. Proposed activities include replanting of about 1,056 acres and therefore would likely result in sooner recovery.
VEG S1 – Unless a broad scale assessment has been completed that substantiates different levels of stand initiation structural stages limit disturbance in each structural stage as follows: If more than 30 percent of the lynx habitat in an LAU is currently in a stand initiation structural stage that does not yet provide winter snowshoe hare habitat no additional habitat may be regenerated by vegetation management projects.	27 percent of the Placid LAU may provide suitable lynx habitat 59 percent of the Boles LAU may provide suitable lynx habitat (see Table 5 for full disclosure of this). The recent wildfires (Jocko Lake and Boles Meadows) resulted in large blocks of area that do not currently provide suitable lynx habitat.	The proposed activities would not change any existing suitable lynx habitat into unsuited.
VEG S2 – Timber management projects shall not regenerate more than 15% of lynx habitat on NFS lands within a LAU within a 10-year period.	27 percent of the Placid LAU may provide suitable lynx habitat 59 percent of the Boles LAU may provide suitable lynx habitat (see Table 5 for full disclosure of this). The recent wildfires (Jocko Lake and Boles Meadows) resulted in large blocks of area that do not currently provide suitable lynx habitat.	The proposed activities would not change any existing suitable lynx habitat into unsuited.

Standards and Guidelines	Pre-Treatment Compliance	Post-Treatment Compliance
VEG S5 – Applies to pre-commercial thinning projects and states: Pre-commercial thinning projects that reduce snowshoe hare habitat, may occur from the stand initiation structural stage until the stands no longer provide winter snowshoe hare habitat only: 1. Within 200 feet of admin sites, dwellings or outbuildings or 2. For research studies or genetic tree tests evaluating genetically improved reforestation stock or 3. Based on new information that is peer review and accepted by the regional level of the Forest Service that meets certain criteria outlined in the amendment	No recent pre-commercial thinning activities have occurred within the Placid or Boles LAUs.	No pre-commercial thinning is proposed with implementation of this project in either LAU.
VEG S6 – Applies all vegetation managements except for fuels treatment projects within the WUI and states: Vegetation management projects that reduce snowshoe hare habitat in multi-story mature or late successional forests may occur only: 1. Within 200 feet of admin sites, dwellings or outbuildings or 2. For research studies or genetic tree tests evaluating genetically improved reforestation stock or 3. For incidental removal during salvage harvest.	The project area is outside of designated WUI areas.	This vegetation removal portion of this project is salvage of dead trees and trees with a low probability of survival (Scott 2002). After field review of proposed units, it is not believed that suitable snowshoe hare habitat exists within proposed salvage units. However, if incidental removal does occur, it would be minimal, but allowable with this standard.

Standards and Guidelines	Pre-Treatment Compliance	Post-Treatment Compliance
Guidelines		
VEG G1 – Vegetation management projects should be planned to recruit a high density of conifers, hardwoods, and shrubs where such habitat is scarce or not available. Priority for treatment should be given to stem exclusion, closed canopy structural stage stands to enhance habitat conditions for lynx or their prey (e.g. mesic monotypic lodgepole stands).	N.A.	Stands selected for treatment are not considered multi-storied forests providing quality snowshoe hare habitat.
VEG G4 – Prescribed fire activities should not create permanent travel routes that facilitate snow compaction. Constructing permanent firebreaks on ridges or saddles should be avoided.	N.A.	Proposed activities do not include increasing open road densities to the public and no permanent firebreaks are proposed.
VEG G5 – Habitat for alternate prey species, primarily red squirrel, should be provided in each LAU.	27 percent of the Placid LAU may provide suitable lynx habitat 59 percent of the Boles LAU may provide suitable lynx habitat (see Table 5 for full disclosure of this). The recent wildfires (Jocko Lake and Boles Meadows) resulted in large blocks of area that do not currently provide suitable lynx habitat.	This project would not reduce the amount of live trees within either LAU with minor exceptions. Therefore, existing secondary prey habitat that exists, would remain following project implementation.
VEG G10 – Fuel treatment projects within the WUI as defined by HFRA should be designed considering Standards VEG S1, S2, S5, and S6 to promote lynx conservation.	N.A.	N.A.
VEG G11 – Denning habitat should be distributed in each LAU in the form of pockets of large amounts of large woody debris, either down logs or root wads or large piles of wind thrown trees (jack strawed piles). If denning habitat appears to be lacking in the LAU, then projects should be designed to retain some coarse woody debris, piles or residual trees to provide denning habitat in the future.	27 percent of the Placid LAU may provide suitable lynx habitat 59 percent of the Boles LAU may provide suitable lynx habitat (see Table 5 for full disclosure of this). The recent wildfires (Jocko Lake and Boles Meadows) resulted in large blocks of area that do not currently provide suitable lynx habitat.	About 92 percent of the recently burned area on National Forest Systems lands within the Placid and Boles LAUs combined would be maintained as they are. All salvage units would also retain snags and down materials within them following treatments. Denning habitat in the future should be abundant throughout both LAUs.

As discussed throughout Table 17 and Table 18, the proposed activities would not violate or prevent attainment of any applicable standards, guidelines or objectives for lynx. In fact, replanting activities would assist recovery of about 1,056 acres in a quicker timeframe than would occur naturally. With the limited suitable lynx habitat that remains within the effected LAUs this project occurs in, it is likely that no lynx would frequent areas near or within the JLFS project area for some time.

Cumulative Effects

Plum Creek lands in and adjacent to the project area have been extensively harvested in the past 40 years. There is limited commercial timber remaining at this time outside of Stream Management Zones on these private lands. It is unlikely that additional roads will be built for the purpose of timber harvest. The potential exists for these lands to be developed for real estate. Some resource management activities will likely continue to occur on these lands regardless of ownership.

Logging activities on federal lands in the project area vicinity has occurred over the last 5 or more decades with the last substantial green harvests occurring in the late 1980s and salvage harvest, in the Boles Meadow area more recently (2003-2005).

The scale of this project is moderate (1,648 acres) and involves no new permanent road building or other permanent development. In regard to cumulative effects to lynx, the anticipated habitat changes related to this project are not substantial. Further, security will be enhanced by more permanent and restrictive road closures. Although the Forest Service lands in this area were substantially changed by the Jocko Lake Fire, they will provide habitat for lynx in the future as the remnant snags fall and stands regenerate. Over time as cover is restored, use of these LAUs by lynx will increase to or above levels experienced several years ago.

Because the effects analysis above was conducted at the same scale and considerations of a regular cumulative effects analysis, no additional analysis is necessary.

Determination

The determination for lynx with the implementation of this project is: "**May Affect**, **Not Likely To Adversely Affect"**. This determination is based on the following rationale:

> Activities planned with this project meet or exceed all objectives, standards and guidelines found in the Lynx Amendment for this type of project.
>
> Lynx would not be expected to be utilizing the portions of the LAUs being proposed for treatments as they are within a larger block of currently unsuited lynx habitat.
>
> The only expected affects to lynx are discountable because they are unlikely to occur, would not change any lynx habitat to unsuited, and the proposed haul routes primarily cross unsuited lynx habitat as well.

Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

Because there would be little change in habitat suitability, both alternatives are consistent with Forest Plan direction to provide habitat for viable populations of all indigenous wildlife species (USDA-FS 1986 p. II-1), with National Forest Management Act requirements to provide for a diversity of animal communities (16 USC 1604((g)(3)(B)) ; also see 36 CFR 219.10(b): and FSM 2670.12, and with ESA requirements to conserve endangered and threatened species and to ensure that actions authorized,

funded, or carried out by them are not likely to jeopardize the continued existence of any threatened or endangered species, or result in the destruction or adverse modification of their critical habitats. Additionally due to proposed road management and decommissioning/storage, Alternative 3 is consistent with Forest Plan direction related to minimizing roads to meet wildlife needs (USDA-FS 1986 p. II-2)

Grizzly Bear (Threatened)

Habitat Status

Features of the existing environment that are relevant to grizzlies include motorized access, cover, habitat suitability, and food and garbage attractants.

Motorized Access – The proposed project is located in an area with high total and open road densities (4.5 mi/mi² and 3.2 mi/mi² respectively on NFS lands). In addition, there are about 17 miles of groomed snowmobile trails within the JLFS project area. In summary, the JLFS project area receives moderate to high motorized use year-round by receptionists.

Grizzly Habitat - The best grizzly habitat in the vicinity of the project lies in the wetland and riparian areas associated with Finley, Placid, Grouse, and Beaver Creeks. These riparian areas, swamps and meadows are best characterized as spring habitat. Summer and fall habitats are generally at higher elevations further to the west, although we know that grizzlies use the lower elevations within and adjacent to the project area in the summer and fall as well.

As stated, the project area is within a checkerboard ownership pattern of federal, state, small private and PCTC ownership. In addition to the Jocko Lake Fire, the forestry activities conducted on the adjacent industrial timberlands in recent years have reduced habitat value for grizzly bears to some degree but overall, habitat conditions on these lands are still generally suitable. Although cover values on these lands are low, motorized access within the large non-NFS blocks are limited by closures which prohibit public access for most of the year.

Cover - Cover, especially along roads, is very important for grizzly bears. Although adult female bears are known to avoid roads, males and younger bears may not (Mace and Waller 1997). Mortality from poaching and mistaken identity hunting is a factor contributing to the bears' continued threatened status. Retention of cover along roads (especially open roads) helps reduce this mortality. Large blocks of cover provide security for bears using areas for feeding, breeding, resting, and other activities.

The Lolo Guidelines call for at least 75 percent of a Bear Management Analysis Area (BMAA) to be cover, based on lands that are typically tree-covered in an undisturbed state. High elevation rocky land is omitted from the analysis. Existing cover values throughout the JLFS project area are low due to the aforementioned wildfire and management of adjacent landowners.

Seventy-six percent of the areas proposed for salvage activities are either identified as high or moderate severity, containing high numbers of dead trees, another 20 percent is listed as low intensity and the remaining 4 percent identified as unchanged. Small amounts of cover do exist within the lower intensity burned areas, but is primarily made up of cover provided by stems, as understory vegetation is lacking throughout 96 percent of the proposed units.

Disturbance/Displacement - The Lolo Guidelines state that major activity like timber sales will occur for no more than 3 consecutive years out of 10 years in a given BMAA. This area is not within a BMAA so activity is not tracked in the same way. In general, there has been no major Forest Service activity in the project vicinity in the past 10 years, with the exception of the Hidden Lake Fuels Reduction and Boles

Salvage. However, there has been ongoing timber harvest activity in this area in recent years on both PCTC and small private lands.

Linkage – There are no grizzly bear linkage areas within the proposed project area boundary.

Sanitation – The project area is covered by the food storage order that applies to the SLRD outside of the recovery area (Lolo National Forest Special Order No. F06-003-LOLO-D6). All project activities would require adherence to this order to ensure all food and garbage would be stored in a bear safe manner (see Management Guidelines).

Inventories and Surveys

Past and on-going survey work used to document grizzly bear use within the project area includes:

- The NCDE Grizzly DNA project
- The aforementioned RMRS lynx research + the National Lynx Survey
- Other grizzly collaring done jointly by USFWS, MTFWP and PCTC
- Incidental track surveys and reports

Environmental Effects

Roads/Access – The effects of roads and road use in areas of grizzly bear habitat outside of the recovery area were described and analyzed in the 2004 Amendment to the Biological Opinion and Incidental Take Statement on the Lolo National Forest Plan (USDA Forest Service 2004). Activities outside of the recovery area associated with this project (hauling) would not impart effects of existing permanent roads or road use in addition to those already covered in the biological opinion (excluding up to 4.0 miles of short-term or temporary road continually closed to the public during and following activities). Consultation on the effects of roads occurring outside the recovery area is complete, the roads are considered as part of the environmental baseline for grizzly bears, and no further analysis on existing roads outside of the recovery area is required.

No new permanent roads would be constructed for the project. As mentioned previously, some short-term and temporary roads would be constructed but these roads would only be used in winter for access/hauling, would be closed yearlong to the public, and would be decommissioned upon project completion. Some BMP work may be conducted on several roads that are closed year-round to the public. No road maintenance work or harvesting would be conducted during the spring season (4/1 – 6/30) due to soils and fisheries issues. In addition, upon completion of this project there would be an overall decrease of roads (10.7 miles) currently open to public travel, which equates to increased security for grizzly bears and other wildlife species.

Cover – The proposed actions may reduce cover, through a reduction of dead and dying trees within proposed salvage units. This effect would not be considered substantial for several reasons. Seventy six percent of the proposed salvage area is composed of moderate to severely burned lands that currently provide little if any cover. Most of these moderate to severely burned treatment areas are also proposed for replanting. This would provide long-term cover in the shortest period of time. Other areas are expected to reseed naturally within a reasonable time or would maintain a sufficient forested component to be considered fully stocked. In addition, having all but one proposed salvage unit winter or cable yarded would minimize damage to newly sprouted, low growing, vegetation.

Disturbance – Short periods (less than 1 month in duration) of slashing, piling and burning may occur in the summer and fall (7/1 – 11/30) following mechanical treatment. No fuels treatment, harvest or road improvement would be conducted during the spring season (4/1 – 6/30) due to wildlife, soils and fisheries concerns. The mechanical fuels reduction is planned for the winter (12/1 – 4/1) season of 2008-09 but may extend into the winter (12/1-4/1) season of 2009-10.

Regarding denning habitat, the areas proposed for treatment are at relatively low elevations (less than 5,800 feet with the majority under 5,000 feet) and are on low to moderate slopes. Based on various studies on grizzly bear den site selection in Montana (Mace and Waller 1996, Servheen and Sandstrom 1993, Aune and Kasworm 1989), it is unlikely that grizzlies would select these low elevation areas for denning, so the possibility of disturbing or displacing a denning grizzly bear is low to very low.

Adequate displacement areas exist in the Mission, South Fork Jocko, Rattlesnake, and Swan subunit which are surrounding the project area on the west and north sides, several being less than 2 miles away. These subunits are a mixture of NFS, PCTC, and Tribal lands with varying levels of human activity. The Swan subunit is bordered to the west by the Mission Tribal Wilderness (which receives little human use) and to the southwest by the Rattlesnake Wilderness (also receives limited human activity). Further, the project area currently has open roads, campgrounds and is near residences. Thus, the additive impacts of the activities proposed under this project would be insignificant in regard to grizzly bear disturbance/displacement, especially given the emphasis on winter activity.

Sanitation and other bear-human conflicts – People working in the woods provide opportunities for grizzly bears (and black bears) to be attracted to food and garbage and to become food conditioned. Management Requirement 2 addresses this issue with food and garbage storage requirements. Further, the entire district is now under an attractant storage order designed to minimize human/bear conflicts.

Cumulative Effects

Plum Creek lands in and adjacent to the project area have been extensively harvested in the past 40 years. There is limited commercial timber remaining at this time outside of Stream Management Zones. It is unlikely that additional roads will be built for the purpose of timber harvest, as sufficient roads already exist to manage these lands. The potential exists for these lands to be developed for real estate. Some resource management activities will likely continue to occur on these lands regardless of ownership.

Forest Service lands in this area were substantially changed by the Jocko Lake Fire, but may continue to provide lower quality suitable habitat for grizzly bears, due to the lack of cover. Over time as cover is restored and insect levels increase in the remaining rotting wood, habitat quality will improve. Logging activities on federal lands in the project area vicinity has occurred over the last 5 or more decades with the last substantial green harvests occurring in the late 1980s and salvage harvest, in the Boles Meadow area more recently (2003-2005).

The scale of this project is moderate (1,648 acres) and involves no new permanent road building or other permanent development. In regard to cumulative impacts on grizzly bears, the anticipated habitat changes related to this project are not substantial. Further, security will be enhanced by more permanent and restrictive road closures. Finally, the District-wide food storage Forest Order should reduce potential for habituation to humans.

Because this project is reducing the amount of open roads and is not adding to the public open road density or long-term administrative open road density, a detailed roads analysis was not performed for the cumulative effects area as this project will improve the trend.

Determination

The determination for this project is "**May Affect, Not Likely to Adversely Affect"**. This determination is based on the following rationale:

> The project is not within the NCDE Grizzly Bear Recovery area and is not within Management Situation 1 habitat. A programmatic biological assessment is in place that covers the effects of existing roads, grazing and sanitation/attractants on grizzly bears. This project would follow the Terms and Conditions of the BO prepared for the programmatic biological assessment, no net increase in permanent roads. It would actually reduce the permanent roads within the analysis area.
>
> No new permanent roads would be constructed. The road improvements would be done on existing roads, most of which are closed to the public year-round. Post project there would be more obliterated and decommissioned roads in the immediate project area which translates to enhanced wildlife security.
>
> Most logging activities would occur during winter (12/1 – 4/1) seasons.
>
> Based on elevation, slope and aspect, the project area is not high quality denning habitat and the probability of disturbing a denning grizzly bear is low to very low.
>
> Cover would remain where it currently exists and an accelerated recovery of long-term cover would occur on about 1,056 acres of salvaged stands that would be replanted. Large areas of non-treated burned areas would remain within the project area post project
>
> A district wide bear attractant order is in place which requires safe storage of all bear attractants.
>
> No grizzly bear linkage zones or corridors would be impacted.
>
> Although portions of the Jocko Lake Fire burned within portions of the NCDE Recovery Area, these areas were avoided and not considered as potential units for this project to minimize impacts to grizzly bears and their habitat.

Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

Because there would be little change in habitat suitability, both alternatives are consistent with Forest Plan direction to provide habitat for viable populations of all indigenous wildlife species (USDA-FS 1986 p. II-1), with National Forest Management Act requirements to provide for a diversity of animal communities (16 USC 1604((g)(3)(B)) ; also see 36 CFR 219.10(b): and FSM 2670.12, and with ESA requirements to conserve endangered and threatened species and to ensure that actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of any threatened or endangered species, or result in the destruction or adverse modification of their critical habitats. Additionally due to proposed road management and decommissioning/storage, Alternative 3 is consistent with Forest Plan direction related to minimizing roads to meet wildlife needs (USDA-FS 1986 p. II-2)

Northern Rocky Mountain Gray Wolf

Habitat Status and Existing Condition

The Gray Wolf was once distributed throughout most of North America. Shortly after European colonization, persecution of wolves began. By the early 1930s wolf populations had been eradicated in Idaho, North Dakota, and Montana and over time were extirpated from the lower 48 states, except

Minnesota. Reproduction did not resume in the western U.S. until 1986 when wolves were found denning in western Montana. The population distribution, life history, habitat status and recovery objectives for gray wolf in R1 are summarized in USDA-FS (2005).

Wolves are habitat generalists that use a diversity of forested and grassland habitats, but tend to avoid areas with heavy human disturbance (USDA-FS 2005, Programmatic BA). Vegetative cover affects wolf survival by providing shelter for prey species such as deer and elk, although in general healthy wolves need little cover.

The U.S. Fish and Wildlife Service consider wolves potentially present on all LNF lands (USFWS 1996, 2005). The project area is north of Highway 12 where wolf populations are considered to be endangered by the U.S. Fish and Wildlife Service. The Montana Department of Fish, Wildlife and Parks publishes progress reports on the wolf recovery program and also sends out weekly reports on the general locations of radio-collared wolves. There are no known wolf packs within 10 miles of the project area. (MTFWP unpublished reports, 2006-07).

Although there are no known wolf dens or rendezvous sites, the project area supports populations of both deer and elk, and the project area is utilized for wolf foraging and dispersal. However due to the Jocko Lakes fire (>70 percent moderately to severely burned), habitat suitability has been altered due to the reduction in cover, increased visibility from roads, and shifts in big game use.

Environmental Consequences

Direct and Indirect Effects

Effects Common to Both Alternatives

Because there are no known den or rendezvous sites and due to the widespread reduction in cover resulting from the Jocko Lakes fire, there would be no expected impacts to wolf den or rendezvous sites anticipated under either alternative.

Effects on elk are discussed under the MIS section of this analysis and as described, while elk distribution and use of the area would change somewhat, available habitat under both alternatives would remain largely unchanged. Although there would likely be some changes in deer use because of the widespread loss of cover, due to anticipated increases in forage and based on observed deer use within burned areas, future deer use of the project area would be maintained or increased under both alternatives.

Alternative 5 (No Action)

Because there are no activities proposed there would be no direct effects to the gray wolf or its habitat under this alternative.

Alternative 3 (Modified Proposed Action)

Direct effects include possible increased disturbance associated with timber harvest, temporary or short-term road construction, maintenance, or supplemental planting. However because implementation would be completed within 3-5 years, and considering over 90 percent of the treatments would occur during the winter, effects would be short term and minor. Additionally considering that there would be a long-term decrease in open roads and an increase in security habitat, potential road related mortality and conflicts with humans would decrease under this alternative.

Cumulative Effects

Cumulative effects to the gray wolf have occurred as a result of hunting, trapping and habitat modification. The Jocko Lakes Fire has created the most recent large change on the landscape and has affected most of the analysis area. Due to the reduction in the overstory, this has resulted in a large decrease in mature forest and an increase in early seral conditions. The overall effect of this has been a large reduction in big game cover and a future increase in big game forage.

By 2012, a total of approximately 6500 acres of salvage are expected to occur within the analysis area on non-federal lands. Because over 90 percent of this harvest would occur on lands that have been moderately to severely burned, potential big game cover would be relatively unchanged.

Current activities such as firewood collection, dispersed recreation, mushroom collection and noxious weed treatment along road corridors would continue. While these activities may result in a short-term, localized source of disturbance to wolves, much of this would be concentrated along open roads and the level of disturbance is not anticipated to increase.

Cumulatively it is expected that ongoing activities identified in Appendix D and anticipated salvage harvest on non-federal lands would result in localized disturbance to both big game and wolves under both alternatives. In addition, Alternative 3 would reduce levels of dead and dying trees on approximately 1648 acres and would reduce live overstory on approximately 80 acres (skyline yarding and road construction). Although cover and suitable big game habitat would continue to be provided on sites treated. As a result there is little difference between alternatives in terms of the cumulative effects to the gray wolf or its habitat.

Summary of Effects and Determination

Based on the analysis presented and the following rationale, implementation of Alternative 5 would have **No Effect** to the gray wolf, whereas implementation of Alternative 3 is consistent with the R1 Programmatic BA (USDA-FS 2005), therefore, Alternative 3 would also have the determination of **No Effect** to gray wolf or their habitat with the following rationale:

- There are no known den or rendezvous sites within the project area. MTFWP has a good handle on pack activity all across MTFWP Region 2.
- There are no livestock grazing permits on FS lands within the project area and no known livestock grazing occurs on adjacent DNRC or PCTC lands.
- Wolf use of this area is currently low, based on MTFWP data.
- The Seeley Lake area has high ungulate densities. While the fire may have had immediate detrimental impacts, even after 1 year post fire, forage values and availability have likely increased exponentially. Given that most activity associated with the project will occur in winter, ungulate displacement should be low as most animals will already be on lower elevation winter range.

Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

Because there would be little change in habitat suitability, both alternatives are consistent with Forest Plan direction to provide habitat for viable populations of all indigenous wildlife species (USDA-FS 1986 p. II-1), with National Forest Management Act requirements to provide for a diversity of animal communities (16 USC 1604((g)(3)(B)) ; also see 36 CFR 219.10(b): and FSM 2670.12, and with ESA requirements to conserve endangered and threatened species and to ensure that actions authorized,

funded, or carried out by them are not likely to jeopardize the continued existence of any threatened or endangered species, or result in the destruction or adverse modification of their critical habitats. Additionally due to proposed road management and decommissioning/storage, Alternative 3 is consistent with Forest Plan direction related to minimizing roads to meet wildlife needs (USDA-FS 1986 p. II-2)

MANAGEMENT INDICATOR SPECIES

Pileated woodpecker

Methodology and Analysis Area

Potential effects to this snag dependent species will be evaluated by looking at changes in the availability of large diameter snags and associated nesting and foraging habitat. Suitable habitat for this species is based on Samson (2006a and 2006b). Foraging habitat is defined as sawtimber or multi-structure forest with at least 10 percent overstory cover, whereas nesting habitat includes stands that contain large diameter trees >=16 inches dbh and at least 50 percent overstory cover. Because stand level data is not available for all stands within the project or CE areas, R1 Vmap data was used to identify potential nest habitat. While the pileated woodpecker is not an old growth obligate, it occurs in higher numbers in areas that have structural conditions (i.e. high canopy cover with large diameter trees and snags) characteristic of old growth. As a result, effects to this species were also evaluated by looking at changes in existing old growth (defined by Green et al 1992).

Site specific data used to assess habitat conditions and effects were based on pre-fire aerial photography, stand exams, Northern Region Vegetation Mapping Project (R1-VMP) data, LANDSAT thermal imagery data, field surveys and photos and data collected during project area field visits. Changes in suitable foraging and nest habitat are displayed by alternative in Table 19.

Because pileated woodpecker territories range between 800 and 1500 acres (Samson 2006b) and considering rationale described under the Process Section of this document, the project area would be of adequate size and provide representative conditions to evaluate the direct, indirect, and cumulative effects to this species.

Species Status, Preferred Habitat and Historical Condition

The pileated woodpecker is considered widespread and common in Montana (MNHP 2006) and functions as an indicator of mature forest/snag habitats on the LNF Plan (USDA-FS 1986). As such, the health of its population acts as an indicator of the condition of habitats for other wildlife species that use large snags and mature forests. The LNF Plan states, “As monitoring technology becomes available for the goshawk and pileated woodpecker, population trends would be monitored. In the interim, habitat parameters including old growth acres and condition, and snag densities would be monitored as an indicator of population trend” (USDA-FS 1986 p. II-14).

The pileated woodpecker’s range extends from central British Columbia south into Northern California, east from Idaho across North Dakota and west from a general line descending south from Minnesota to eastern Texas (Bull and Jackson 1995). This species is not considered to be migratory and is most often associated with mature forests across its range. The presence of large trees for nesting is considered more important than forest age and the species appears to do well in young and fragmented forests with abundant remnant older structure (Kirk and Naylor 1996).

This species nests in snags and each year excavates a new cavity, usually in a dead tree at least 21” in diameter and at least 30 ft. high (Bull et al. 1999). Due to their longevity and large size, western larch and ponderosa pine were found to be preferred in old growth habitat (McCelland and McClelland 1999),

although selection of the nest tree also depends on the availability of suitable snags (Kirk and Naylor 1996 *In* Samson 2006a). Bull and Holthausen (1993) found that the presence of snags >20" dbh were found to be the best predictor of occupied habitat and the Northern region model for the pileated woodpecker uses a minimum size of 16 inches dbh for suitable nest trees (Samson 2006b).

The pileated woodpecker relies heavily on snags and downed woody debris for foraging and 12 to 30 tons of DWD typically occur in stands that are utilized. They forage primarily for carpenter ants and other wood boring beetles in both live and dead wood and often forage on or near the ground in logs, snags, live trees and stumps (Bull and Hothausen 1993). Historically levels of DWD were reduced due to periodic wildfires that burned across the landscape at mixed severity intervals of between 30 and 75 years (Arno et al 1997 *In* USDA-FS 2008b). As a result and due to decades of fire suppression, levels of DWD within the project area prior to the Jocko Lakes fire were higher than what would have occurred historically.

Winter roosts are important and appear to be in habitats similar to those used during the breeding season. As a result, the foraging model for the pileated woodpecker in the Northern Region is based on winter foraging requirements, which includes sites containing trees >= 10" dbh (Samson 2006a).

In general, there is a positive correlation between forest age and the amount of wood decay (Smith 1970 *In* McClelland and McClelland 1999). So while this species prefers late successional and old growth habitat, foraging within younger stands is documented and territories are not confined just to old growth habitat (McClelland 1979 *In* McClelland and McClelland 1999). Also Bonar (2001 *In* Samson 2006a) found that the pileated woodpeckers used all available habitats at all scales to select suitable nest cavity trees and foraging habitat.

This species has a large home range and although home range size varies (700 acres to 1500 acres), in the Northern region it is considered to be approximately 1000 acres (Samson 2006a). Habitat available within the home range varies with the size of home range and smaller home ranges tended to have a high percentage of the area in grand fir, old growth, un-logged stands and stands with >=60 percent canopy closure (Bull and Holthausen 1993).

Existing Condition

Samson (2006b) estimated that approximately 90,500 acres of suitable habitat are necessary to maintain a minimum viable population of this species and currently R-1 provides over 20 times as much habitat as is necessary to maintain a minimum viable population, whereas the Lolo NF alone provides approximately 1.7 times as much habitat as is necessary to maintain a Region-wide minimum population of pileated woodpeckers (Samson 2006b).

While preferred, grand fir is not present in the JLFS project area, although the area does contain large western larch, ponderosa pine and Douglas fir suitable for nesting. Also prior to the Jocko Lakes fire, preferred old growth habitat (as defined by Green et al 1992) occurred on approximately 6 percent of the project area and much of this acreage would likely provide preferred nesting habitat. Suitable foraging habitat would have been widespread across the project area.

While the pileated woodpecker has been documented foraging in stands with as little as 10 percent canopy closure (Samson 2006a), due to mortality resulting from the Jocko Lakes fire, approximately 70 percent of the project area no longer provides the conditions preferred by this species for nesting. Similarly, while approximately 11 percent of the project area contains a large diameter snag component (>=16"dbh), almost 70 percent of these lands were moderately to severely burned. So while some large snags may be available on these sites, it is unlikely these areas would be utilized for nesting due to the reduction in canopy. This is consistent with Smith (2000), who states that while forging would be expected to occur, pileated woodpeckers do not nest in recent stand replacement burns.

Surveys for the species have not been conducted and although there are no known nest trees, this species was heard in a large diameter stand (See project fire notes) in the Placid Creek drainage and in unburned portions of potential old growth in Section 26 (Upper Finley Creek).

Environmental Consequences

Direct and Indirect Effects

Table 19 displays alternative nesting and foraging habitat. As described above, nesting and foraging habitat includes stands with canopy closures consistent with pileated woodpecker use (Samson 2006a) that are likely to contain large diameter trees and snags and are considered suitable habitat.

Table 19: Pileated Woodpecker Alternative Summary

	Alternative 3		Alternative 5	
Suitable Habitat	**Acres**	**Percent**	**Acres**	**Percent**
Foraging[a]	2488	345	2488	345
Nesting[b]	1857	255	1867	255

[a] - Foraging - mature and multi-structure forest with at least 10% residual canopy
[b] - Suitable nesting – includes mature and multi-structure forest with at least 50% residual canopy.

Effects Common to Both Alternatives

Although the pileated woodpecker forages and nests in a variety of canopy conditions, the Northern Region habitat model for the pileated woodpecker assumes that suitable habitat must have a minimum of 10 percent forested cover with trees 9 inches or greater in diameter (Samson 2006b). Prior to the Jocko Lakes fire approximately 4400 acres (60 percent of the project area) provided suitable foraging habitat. However due to high intensity burning conditions that resulted in greater than 90 percent overstory mortality, total suitable nest habitat has been reduced to approximately 1900 acres (25 percent of the project area).

Because no salvage is proposed with Riparian Habitat Conservation Areas and with implementation of project design features to protect wetland habitat, there would be no reduction in suitable riparian habitat under either alternative.

Although not an old growth obligate (Samson 2006a), because old growth stands are characterized by a greater density of large diameter trees and downed woody debris, the pileated woodpecker has the potential to occur in greatest density (small home range) within old growth. The JLFS project area contains 430 acres existing old growth. Of this, over 50 percent experienced overstory mortality in excess of 50 percent and these sites no longer provide suitable pileated woodpecker habitat. Because the decision was made early in the planning process not to harvest in existing old growth, neither alternative would affect existing old growth.

The pileated woodpecker relies heavily on snags and DWD for foraging and 12 to 30 tons of DWD typically occur in stands that are utilized (Bull and Hothausen 1993). Because project design features call for the retention of at least 15 tons/acre in all treatment units, both alternatives are expected to provide levels of DWD selected for by this species.

Alternative 5 (No Action)

Because there are no federal actions proposed under this alternative, there are no direct effects anticipated and indirect effects are based on the amount and quality of suitable nesting and foraging habitat available. While suitable nesting and foraging habitat would be provided on approximately 34 percent of the project

area, the quality of available habitat depends on the density and distribution of large diameter snags. Because no trees would be harvested under this alternative and considering the increase in medium and large diameter snags, it is assumed that all suitable habitat that currently has >50 percent canopy closure (1867 acres) would provide nesting habitat conditions preferred by the pileated woodpecker.

Alternative 3 (Modified Proposed Action)

Because this species is a year-round resident, direct effects include disturbance and possible mortality during timber harvest, landing construction and new road construction. However with seasonal restrictions (no harvest between 4/1 and 6/30), all harvest would occur when young are mobile and the potential for mortality would be greatly reduced. Additionally this species is usually tolerant of human activity near the nest and although some birds that are roosting or nesting on a site may move out of the area (http://bna.birds.cornell.edu/bna/species/148/articles/conservation), any disturbance would be limited to the implementation period (2009-2012) and effects would be short-term in nature.

Under Alternative 3, potential snags would be removed on 1648 acres proposed for salvage harvest and on approximately ten acres of ROW clearing associated with temporary and short-term spec. road construction. Of the acreage proposed for salvage, 520 acres are considered suitable nesting habitat. Because some snags between 16 and 20 inches dbh would be removed during salvage, potential nest trees would be reduced on this acreage. Implementation of project design features require the retention of some medium and large diameter snags, including all snags >= 21 inches dbh. Additionally, because DWD would be retained in all units, salvage harvest is not expected to reduce suitable nesting or foraging habitat. A total of 61 acres of suitable nest habitat are proposed for skyline yarding and of this, 10 acres are close to the minimum threshold for preferred canopy closure. Because skyline yarding would reduce the live canopy, it is likely that suitable habitat would be reduced in this acreage.

Cumulative Effects

Effects Common to Both Alternatives

Potential cumulative effects to this species include any activities that reduce forest cover and remove large diameter snags including wildfire, road construction, private land development, firewood harvest, and timber harvest. The environmental baseline or 2008 habitat in Table 20 reflects pileated woodpecker habitat conditions that have resulted from these past activities, whereas alternative conditions in 2012 reflect habitat conditions resulting from on-going and anticipated future cumulative effects. The 2012 condition under both alternatives reflects non-federal salvage (harvest since the 2007 fire and remaining salvage) and previously approved federal harvest within the analysis area. This includes a total of approximately 6,700 acres of harvest including 1) 5200 acres of salvage on Plum Creek lands, 2) 1200 acres of salvage on Montana Department of Natural Resources and Conservation (MTDNRC) lands and 3) Approximately 400 acres of harvest on NFS lands associated with the Hidden Lake Fuels EA.

Because salvage on non-federal lands is expected to remove most of the large diameter snags, as well as many residual trees, any sites harvested on non-federal land are no longer considered suitable nesting or foraging habitat. This reduction in suitable habitat on non-federal lands is displayed in Table 20 and is the same for both alternatives. Although there would be a small reduction in suitable nest habitat from salvage proposed under Alternative 3, foraging habitat would be maintained and it is estimated that approximately 39 percent of the analysis area would continue to provide pileated woodpecker foraging habitat under both alternatives. As a result cumulative impacts between alternatives are almost identical and it is anticipated that future activities would reduce suitable foraging habitat by 3 percent and suitable nesting habitat by 1 percent under both alternatives. This small reduction in habitat is largely because over 80 percent of non-federal salvage harvest within the analysis area occurs on lands that were moderately to severely burned and no longer provide suitable habitat.

Table 20: Current and Future Pileated Woodpecker Habitat

Pileated Woodpecker Habitat	2008		2012 (Alt 3)		2012 Alt 5	
	Acres	%*	Acres	%*	Acres	%*
Foraging	17,011	42	15,684	39	15,684	39
Nesting	4,022	10	3,813	9	3,823	9

* - % of analysis area

Although existing and future suitable nesting and foraging habitat on non-federal lands meets the overstory and large diameter tree criteria, because past harvest on these lands typically involved removal and/or cutting of large diameter snags, habitat suitability on these lands would be expected to be marginal and preferred habitat conditions would be expected to occur largely on available NFS lands under both alternatives.

Anticipated firewood harvest, which includes all lands within 100 feet of an open road has been occurring for decades and is expected to continue in the future under both alternatives. Similarly road maintenance and removal of hazard trees and potential snags would continue under both alternatives.

Summary of Effects and Determination

The availability of dead wood would be unchanged on all project area lands under Alternative 5 and 77 percent of the project area under Alternative 3. Additionally due to the retention of all existing old growth and considering project design features would maintain snags and DWD on all sites proposed for salvage, habitat for cavity nesting species such as the pileated woodpecker, as well as species that prefer or require old growth would be maintained under both alternatives.

Alternative 5 – Because there are no activities proposed, implementation of Alternative 5 **is Not Likely to cause a local or regional change in habitat quality or population status.**

Alternative 3 –Implementation of Alternative 3 could cause mortality or disturbance to individual birds and would reduce snags on approximately 28 percent of existing habitat. However implementation of seasonal harvest restrictions would be expected to reduce potential for direct mortality/disturbance, as well as maintain suitable conditions on all sites proposed for treatment. As a result, Alternative 3 **May Impact individuals or habitat, but is not expected to cause a local or regional change in habitat quality or population status.**

Additionally the above determination is consistent with Samson (2006b), who concluded that short-term viability of the pileated woodpecker in the Northern Region is not an issue because; 1) No scientific evidence exists that the pileated woodpecker is decreasing in numbers, 2) Increases in the extent and connectivity of forested habitat have occurred since European settlement, 3) Well-distributed and abundant pileated woodpecker habitat exists on today's landscape and 4) The level of timber harvest in the Northern Region is insignificant in regard to altering pileated woodpecker habitat at the population scale.

Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

Because suitable nesting and foraging habitat would continue to be available under both alternatives and considering all sites proposed for treatment under Alternative 3 meet or exceed levels of snags and downed woody debris recommended in the Forest Plan (USDA-FS 1986, the LNF Downed Wood Guide (USDA-FS 2006) and the Region 1 Snag Management Protocol, USDA-FS 2000a), both alternatives are

consistent with Forest Plan direction to provide habitat cavity nesting wildlife and species dependent on snags (USDA-FS 1986 p. II-2, USDA-FS III-72, USDA-FS 1986 III-33-34). Also old growth would continue to occur on 10 percent of the project area and because neither alternative would affect existing old growth, both alternatives are consistent Forest direction to maintain 8 percent of the landscape in old growth (USDA-FS 1986 p.II-61). Based on the above analysis, both alternatives are also consistent with Forest Plan direction to provide habitat for viable populations of all indigenous wildlife species (USDA-FS 1986 p. II-1) and with National Forest Management Act requirements to provide for a diversity of animal communities (16 USC 1604((g)(3)(B)); also see 36 CFR 219.10(b): and FSM 2670.12.

Elk

Methodology and Analysis Area

Elk would be evaluated by looking at changes in the amount and quality of cover and forage, security habitat, risk of elk mortality and changes in distribution and use. Suitable habitat is based on work by Thomas et al (1988), although cover definitions were modified somewhat because understory conditions under the broad definitions by Thomas et al (1988) did not provide the desired cover (due to modification of the understory by fire). Also because there are no specific Forest Plan Standards or Guidelines regarding hiding cover, analysis of hiding cover would only be used as a guide to display broad changes across the project area. Because the majority of the project area consists of elk summer range and because studies in Montana (Marcum 1975, 1976 *In* Thomas 1979) indicate that elk make disproportionate use of areas within 1,050 feet of water, cover conditions within riparian areas would also be assessed.

The project areas falls within HD 285 of the Bob Marshall Elk Management Unit and population trend information is based on information provided in the Elk Management Unit Plan for HD 285 (MTFWP Elk Plan 2005). Site specific data used to assess habitat conditions and effects is based on pre-fire aerial photography, stand exams, Northern Region Vegetation Mapping Project (R1-VMP) data, thermal imagery data (RAVG), field surveys and photos and data collected during project area field visits.

Species Status, Preferred Habitat and Historical Condition

Elk are a commonly hunted MIS identified in the Lolo Forest Plan and elk population data collected by the Montana Department of Fish, Wildlife and Parks is used in combination with habitat data to monitor elk habitat relationships (USDA-FS 1986 II-14). Use of an area by elk is determined by the amount, type and interspersion of forage, water and cover. Optimum habitat on summer/fall ranges often contains approximately 40 percent cover and 60 percent forage (Thomas 1979), whereas the Lolo Forest Plan calls for maintaining a minimum cover/forage ratio of 50:50 within winter range. Both deer and elk require water on summer range and studies in Montana (Marcum 1975, 1976 *In* Thomas 1979) indicate that elk make disproportionate use of areas within 1,050 feet of water. Optimum habitat also requires both hiding cover, which is defined as vegetation capable of hiding 90 percent of a standing elk from view at 200 ft., and thermal cover, which is defined as any stand of coniferous trees 40 ft. or more in height with an average canopy closure exceeding 70 percent (Thomas 1979). Area and spatial arrangement are also important and thermal cover loses its effectiveness as patch sizes get smaller. Hiding cover also usually contains shrubs, or downed logs that provide security for newborn calves and calving habitat us usually located on spring/fall range where slopes are gentle, usually less than 15 percent (Thomas 1979).

Existing Condition

While portions of the project area receive some year-round use by elk, over 90 percent of the JLFS project area is considered elk summer range. Although 12 acres of MA 23 (elk winter range) occur within the project area, there is no critical elk habitat, (as defined by the Montana Department of Fish, Wildlife and Parks).

The Bob Marshall Elk Management Unit (EMU) encompasses 6,280 square miles and consists of 15 hunting districts across several national Forests. Approximately 73 percent of this EMU is in federal ownership. Due in part to road closures on Plum Creek Timber Company lands and on NFS lands, elk numbers have steadily increased and are currently at or near modern day highs (MTFWP Elk Plan 2005). These closed roads were in addition to lands managed under the Block Management Program (limited access) and security for elk is generally considered widespread across HD 285, with low security areas for elk more localized in distribution (MTFWP Elk Plan 2005). However due to the large open road density that exists (3.2 miles/mi^2), much of the project area does not provide high quality security habitat.

Prior to the Jocko Lakes fire, approximately 85 percent the project area provided some elk cover. However the Jocko Lakes fire altered affected watersheds from a cover dominated landscape to a more open landscape (See Table 6), with scattered patches of cover. For the purpose of this analysis cover is broken down into three categories, which vary depending on fire severity. Definitions for habitat categories are shown below and Table 21 displays current elk habitat within the project area.

Satisfactory cover – Satisfactory cover includes sapling or larger stands that were unburned, and pole or larger stands that were lightly to moderately burned (low end of moderate) and experienced less than 25 percent basal area mortality.

Marginal Cover – Marginal cover includes sapling and larger stands that were lightly or moderately burned, that experienced between 25 and 50 percent basal area mortality.

Foraging – Non-forested stands and forested stands that did not meet the cover requirements and are within 500 feet of cover.

No Cover or Foraging – lands that did not meet cover requirements and foraging areas greater than 500 feet from existing cover.

Table 21: Elk Cover Summary

Elk Cover	Acres	% of Project Area
Satisfactory	2,472	33
Marginal	845	11
Total Cover	3317	45
Foraging	2642	36
No Cover or Foraging	1426	19

Prior to the Jocko Lakes fire, approximately 65 percent of the project area contained suitable elk cover, as defined by Thomas et al (1988). However the 2007 fire eliminated elk cover on over 50 percent of the project area and it is estimated that currently only 33 percent of the project area provides satisfactory elk cover. Although it is difficult to predict areas that no longer provide suitable foraging habitat, research indicates that elk prefer to have hiding cover within approximately 500 feet of forage (Thomas and Toweill 1982 *In* Sheppard EA). Based on this, it is estimated that currently 19 percent of the project area no longer provides cover or suitable foraging habitat.

Because the project area is heavily roaded with a high open road density (3.2 miles/mi^2), elk security habitat, which is often defined as lands greater than ½ mile from an open road is limited to approximately 100 acres in the southeast corner of the project area. In order to assess more remote portions of the project area that would be most attractive to elk, lands greater than ¼ mile from an open road were identified and for the purpose of this analysis, these areas are referred to as elk security habitat.

Direct and indirect effects are evaluated by looking at changes on NFS lands within the project area. The project area boundary was selected because it includes all areas proposed for treatment, is representative of fire severity and overstory mortality and because it contains an adequate diversity of habitat conditions (vegetative and topographic) to assess elk distribution and use. Cumulative effects to elk will be evaluated by looking at all lands within the affected watershed area (40,536 acres). In addition to rationale described under the process section of this report, the CE boundary was selected because it includes both burned and unburned areas and can be used to assess habitat for elk displaced by the fire.

Environmental Consequences

Table 22 displays alternative changes in elk cover that are expected to occur within the next five years (2012). Because only dead and dying trees would be salvaged (Alternative 3), there is little change between alternatives in terms of the amount of live overstory remaining and the differences between alternatives largely reflect an anticipated reduction in cover that would result due to removal of dead trees. Table 22 also displays security habitat that would occur under each of the alternatives and the amount of riparian habitat with cover.

Table 22: Elk Alternative Habitat Summary

	Alternative 3		**Alternative 5**	
Elk Cover	Acres	%[a]	Acres	%[a]
Satisfactory	2473	33	2473	33
Marginal	689	9	845	11
Total Cover	3151	43	3317	45
Riparian Cover[b]	1718	23	1718	23
Security Habitat	2000	3.1[3]	1737	3.3[c]

[a] - % of the project area
[b] – Amount also included in total cover
[c] - miles/mi^2

Direct and Indirect Effects

Effects Common to Both Alternatives

Because pre-fire cover has been reduced by almost half and considering approximately 19 percent of the project area occurs greater than 500 feet from existing cover, elk distribution and use patterns are expected to change under both alternatives. This is particularly the case in portions of upper Placid and Slippery Creek that contain over 75 percent of the unsuitable elk habitat. In addition to spatial changes, it is expected that daily use by elk would also change and due to reductions in cover resulting from the fire, it is expected that elk foraging in many areas would occur largely at night. Additionally, because large concentrations of down woody material can impede big game movements (Thomas et al., 1979, Thomas and Toweill 2002) and considering levels of DWD would greatly increase both in the short (3-5 years) and long-term (10-30 years) (See Table 11), changes in elk use within the project area would continue to occur under both alternatives.

While proposed salvage under Alternative 3 would open up the canopy on sites treated, re-establishment of the understory would be determined largely by the intensity of fire. As a result, re-establishment of herbaceous and woody vegetation and elk forage is expected to be similar under both alternatives. Herbaceous forage (grasses and forbs) is expected to recover rapidly (2-3 years) in all but the most severely burned areas, whereas on severely burned sites it may take up to five years for vegetation to re-establish. Although it may take 10-15 years for woody vegetation to achieve its pre-fire diversity, abundance and height, overall, herbaceous and woody vegetation and big game forage is expected to

greatly increase throughout the project area both in the short (five years) and long term (10-20 years) under both alternatives.

Although alternative 3 will reduce the amount of live overstory on 45 acres of satisfactory cover proposed for skyline logging, much of this site consists of un-burned or very lightly burned (<10 percent mortality) areas. As a result, adequate cover will be maintained and there is no anticipated reduction in satisfactory cover under either alternative.

As described previously, elk make disproportionate use of lands near water and riparian areas provide important elk habitat. Because the importance of riparian areas was recognized early in the planning process, there is no timber harvest or changes in elk cover within riparian areas (RHCAs) under either alternative.

Due to the widespread reduction in cover, elk vulnerability to both hunters and predators would increase for the next 5 to 10 years. Additionally, the widespread increase in DWD (See Table 11) would restrict access and likely affect elk movements in some areas. As a result, elk distribution and use of the project area would be expected to change under both alternatives. This also may affect hunter use and success.

Alternative 5 (No Action)

Elk vulnerability to hunters is partially dependent on road access. Because hunters currently have access to much of the project area and considering road management will be unchanged under this alternative, it is likely that the reduction in cover will increase hunter related mortality under this alternative. Changes in use patterns would be expected to reduce this somewhat.

Alternative 3 (Modified Proposed Action)

No timber harvest is proposed on 77 percent of the project area and effects on these lands would be the same as described under the effects common to both alternatives.

Direct effects under this alternative include disturbance during timber harvest, landing construction and road construction/maintenance. However project design features call for the closure of all new roads during following harvest. Also road decommissioning and storage combined with road closures during the big game season would increase security habitat and decrease hunter access. For these reasons, hunter related mortality is expected to be reduced from that of Alternative 5. Also seasonal restrictions to timber harvest on over 94 percent of the proposed units (no timber harvest between 4/1 and 6/30), would minimize disturbance related impacts during spring calving. Further, because all implementation would occur within the next four years, disturbance would be short term in nature.

Marginal cover areas contain much less live overstory and would have more dead material removed. As a result it is expected that the marginal cover sites harvested would no longer provide elk cover and under this alternative, proposed salvage would reduce marginal cover by 156 acres. There are currently only 12 acres of MA 23 or elk winter range within the project area and only 3 acres of this currently provide elk cover. While 3 acres of this area is proposed for harvest (tractor logging), this is largely made up of satisfactory elk cover, so while salvage would reduce dead trees, it would not be expected to further reduce elk cover within winter range.

The anticipated reduction in cover under this alternative represents approximately a 5 percent reduction (156 acres) in the total amount of current elk cover. Across the project area as a whole, approximately 43 percent of the project area would continue to provide some form of elk cover under this alternative (See Table 19). Also with the exception of upper Placid and Slipper John Creeks, much of which were severely

burned, there is a fairly good distribution of available cover on NFS lands within the project area, including lands within 1050 feet of water.

Elk wallows and wet meadows are an important habitat component. Although there is no salvage proposed within RHCAs, most wallows are small in size and occur in predominately upland areas. As a result it is possible that some wallows could be adversely affected by harvest. In order to reduce the risk of impacts, project design features call for the protection of any elk wallows identified during project layout.

Although this alternative would result in four miles of new road construction (short-term spec & temporary roads in Table 1), implementation includes 10.7 miles of road decommissioning and storage. Because 2.4 miles of this work would occur on roads that are currently open, security habitat would be increased to 27 percent of the project area under this alternative. Additionally in order to reduce hunter related mortality, 8.9 miles of road that currently access security habitat and are normally used for hunter access would be closed during the big game hunting season. So while elk cover would be reduced under this alternative, the increase in security habitat and reduced hunter access until cover becomes reestablished, is expected to reduce hunter related elk mortality within the project area and result in long-term improvements in elk habitat.

Proposed landing construction under this alternative would involve removal of approximately 60 acres of trees. Although cover would be reduced on this acreage, because of their small size (¼ to ½ acre) and scattered nature, these would occur as inclusions or small canopy gaps and cover within the affected stand would not be reduced. Also because all landings would be re-seeded with herbaceous vegetation following use, these areas would continue to provide foraging habitat.

Several site specific concerns related to elk were raised during scoping including 1) a concern was raised over salvaging remaining timber in Sections 34 and 26 (T16N, R16W) and possible reduced use of logged areas by elk and increased predation and human caused mortality, 2) concerns were raised over possible impacts to a wet area in Unit 22-1, and 3) concerns were identified that logging was proposed within old growth. Changes in the proposed action and project design criteria that were developed in part to address these concerns include; 1) identification of project design features that require protection of all elk wallows identified during project layout, closing roads during hunting seasons, and reducing open road density, 2) Harvest in section 26 has been broken up so that un-logged areas occur between salvage areas, including dropping over 30 acres in the SW corner of section 26 that adjoins section 34, 3) salvage adjacent to the elk calving area of concern has been reduced, and 4) there would be no harvest within old growth. So while a reduction in elk cover in section 34 (skyline logging on 45 acres) is recognized, as described above, it is expected that adequate elk cover would continue to occur in this area.

Cumulative Effects

Effects Common to Both Alternatives

Cumulative effects to elk have occurred as a result of both hunting and habitat modification. Historically elk were impacted by over hunting and populations declined across the species range and in many areas, elk were extirpated. As game regulations began to facilitate elk recovery, habitat modifications and road construction into secure areas became important elk management issues. Currently, elk populations in Western Montana area at all time highs due to game laws, access management, improved forestry practices and overall integrated efforts to protect this species.

Reductions in habitat have resulted due to conversion of forest to non-forest habitat though private land development, reduced security due to road construction and human access and changes in cover/forage

conditions due to timber harvest. Appendix D summarizes cumulative effects within the project area and burn area. Past timber harvest has occurred on approximately 65 percent of the analysis area and has affected over 95 percent of Plum Creek lands, and approximately 50 percent and 42 percent of DNRC and NFS lands respectively within the analysis area. Much of this harvest involved regeneration cutting which also resulted in a reduction in mature cover and an increase in early structural forest conditions. Although most of the past harvest is over 20 years old and some cover would have been restored prior to the fire.

The Jocko Lakes Fire has created the most recent change on the landscape and has affected approximately 60 percent of the analysis area. Due to the reduction in the overstory, this has resulted in a large decrease in mature and multi-structure forest and an increase in early seral conditions. The overall effect of this has been a large reduction in cover and an increase in available forage.

By 2012, a total of approximately 6400 acres of salvage are expected to occur within the analysis area, including 5200 acres on Plum Creek lands and 1200 acres on DNRC lands. Because over 90 percent of this non-federal harvest would occur on lands that have been moderately to severely burned, these areas no longer provide adequate cover for elk. However ongoing and future salvage on non-federal lands would reduce elk cover on approximately 500 acres. Also while there would be some new road construction and a possible reduction in elk security on non-federal lands, because this is occurring in areas where cover has already been reduced due to the fire, elk use and potential adverse impacts would be reduced. If these new roads are left open, future impacts could result when cover is re-established (>15-20 years).

Approximately 40 percent of the analysis area has not been affected by the Jocko Lakes fire and although the quality of cover varies, approximately 70 percent of the NFS lands currently provide elk cover. Anticipated future timber harvest on these lands includes approximately 400 acres of harvest associated with the Hidden Lake Fuels project. Although all treatments involve partial harvest activities and some elk cover would be maintained on sites treated.

Current activities such as firewood collection, dispersed recreation, mushroom collection and noxious weed treatment along road corridors would continue. While these activities may result in a short-term, localized source of disturbance, much of this would be concentrated along open roads and the level of disturbance is not anticipated to increase.

Cumulatively it is expected that ongoing activities identified in Appendix D and anticipated salvage harvest on non-federal lands would contribute to localized reductions in habitat security and cover. Although most of this would occur within portions of the analysis area affected by the Jocko Lakes fire, it is estimated that approximately 70 percent of the un-burned portions of the analysis area would continue to provide elk hiding cover. Due to the availability of early successional vegetation created by the fire, elk foraging habitat is widespread. However there are large blocks that are greater than 500 feet from cover and these areas would receive little use for 5-10 years, until cover increases (increased downed wood and seedling development).

Due to the widespread reduction in elk cover it is expected that hunter related mortality would increase and that elk distribution and use would change on both NFS and non-federal lands.

Alternative 3 (Modified Proposed Action)

In addition to cumulative effects described under Alternative 5, Alternative 3 would reduce total elk cover by approximately 150 acres and increase disturbance to elk on the 1648 acres proposed for treatment.

Summary of Effects and Determination

Alternative 5

Because the Jocko Lakes fire has greatly altered cover and forage conditions, elk distribution and use of the area is expected to change. Also due to the reduction in cover, it is likely that increased mortality would occur. However elk numbers have steadily increased within HD 285 and are currently at or near modern day highs (MTFWP Elk Plan 2005). As a result and considering available cover would continue to occur within and adjacent to the area affected by the Jocko Lakes fire, implementation of Alternative 5 **is not expected to cause a local or regional change in population status or a regional change in habitat quality.**

Alternative 3

Alternative 3 would reduce elk cover on approximately 150 acres and result in possible disturbance on 1648 acres proposed for salvage. However based on the above analysis and the following rationale, implementation of Alternative 3 **May Impact individuals or habitat, but is not expected to cause a local or regional change in habitat quality or population status.**

- Over 77 percent of the project area would be unaffected by treatment.
- Elk numbers have steadily increased within HD 285 and are currently at or near modern day highs. As a result and considering elk distribution and use of the area would shift to take advantage of remaining cover, elk populations are expected to be maintained.
- Because salvage harvest only involves removal of dead wood and considering project design features would ensure that downed woody debris would be retained on all sites proposed for treatment, it is anticipated that cover would continue to be provided on over 90 percent of the sites treated.
- Project design features (no harvest between 4/1 and 6/30) would ensure that timber harvest does not occur during calving and there are no anticipated impacts to calf recruitment and potential disturbance during this period is greatly reduced.
- Proposed road decommissioning and storage would reduce human access and increase available security habitat, which would result in a long-term improvement in elk habitat. Also closure of over 8 miles of roads into elk security habitat during hunting seasons is expected to reduce hunter related mortality.
- Existing cover/forage ratios within both winter and summer range would be relatively unchanged from the present condition and are consistent with Forest Plan direction.

Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

The Forest Plan includes objectives to increase big game populations, particularly elk (USDA-FS 1986 p. II-2) and to provide habitat for viable populations of all indigenous wildlife species (USDA-FS 1986 p. II-1). It also includes standards to protect important big game habitat and requires that individual projects incorporate considerations for maintaining or improving elk summer and winter habitat (USDA-FS 1986 III-71 & III-128). Although Alternative 3 would result in short-term impacts to elk cover, project design features are in place to reduce impacts and considering proposed road storage/decommission would result in a long-term improvement in elk security, and that current elk numbers are at a modern day high, implementation of both alternatives are consistent with Forest Plan direction related to management of

elk, as well as with direction related to minimizing roads to meet wildlife needs (USDA-FS 1986 p. II-2), and with FSM direction (FSM 2601.2, 2602, and 2603) to manage for species in demand for hunting.

Northern goshawk

Methodology and Analysis Area

Potential effects to the northern goshawk will be evaluated by looking at changes in nesting, foraging and post-fledgling habitat, which are based on the Northern Region model (Samson 2006b) and conservation assessment (Samson 2006a) for this species. Thresholds for suitable habitat are described below and although they are based largely on work by Samson (2006a) and Reynolds (1992), have been modified somewhat to incorporate site specific conditions resulting from the fire. Suitable habitat and effects were evaluated using information contained in the LNF timber and stand database (TSMRS), Forest-wide wildfire activity, Regional conservation assessments, and GIS data related to stand and landscape level vegetative conditions, fire severity, old growth stand and landscape structural characteristics, past management, roads and trails, and stream and riparian habitat.

The JLFS project area was used to assess the existing condition and direct and indirect effects to this species. This area was chosen because it contains preferred forest communities including an old growth component. Also the mix of burning conditions, forest and non-forested structural conditions, and past management activities are representative of those found on the landscape. The cumulative effects area for this species includes the 63 square mile sub-watershed area identified earlier. This area was selected so that potential impacts within this species home range could be adequately assessed and because it includes adjacent lands that could be utilized by goshawk displaced by the fire.

Species Status, Preferred Habitat and Historical Condition

The goshawk is found throughout North America with breeding documented from Alaska to Newfoundland and south through the Rocky Mountains, Sierra Mountains, and into Mexico. In R1, the species breeds in mountainous or coniferous regions throughout western and southern Montana as well as north and north central Idaho. Goshawks winter throughout their breeding range with a portion of the population wintering outside regularly used areas. For example, wintering occurs in north central and eastern Montana but that area is not depicted as part of the species breeding range (Montana Distribution committee 1996; Squires and Reynolds 1997).

The northern goshawk has a conservation status rank of G5 (Natureserve 2008) and this species is considered globally secure (common; widespread and abundant), although in Montana it is identified as a species of special concern (http://fieldguide.mt.gov/detail_ABNKC12060.aspx). The Montana Partner In Flight (PIF) Conservation Plan identifies the northern goshawk as a priority II species, or species in which the State has a high responsibility to monitor the status of the species and/or to design conservation actions (PIF 2000).

The most recent petition for listing the goshawk under the Endangered Species Act occurred in 1997. After a formal 12-month review by a scientific committee, the U.S. Fish and Wildlife Service (Service) determined that listing under ESA was not warranted. Analysis of data from 17 states comprising 222 million acres indicated “that the goshawk population is well distributed and stable at the broadest scale (63 FR 35183 (June 29, 1998)).

Until June 2007, the northern goshawk was listed as an R1 sensitive species (USDA-FS 2008). However because regional studies demonstrated that 1) habitat exists to support reproductive individuals on each forest, 2) habitat is well distributed and 3) individual goshawks can interact with one another across the region, the goshawk did not meet the sensitive species criteria in FSM 2670.5 and was removed from the

R1 sensitive species list. Although the goshawk is no longer a sensitive species, on the LNF the goshawk is considered an MIS and analysis of goshawks and their habitat are assessed at the project and forest levels.

In Montana the northern goshawk is a year round resident (MFG 2008) and breeding season habitat includes three areas including the; 1) nest area, 2) post-fledgling area (PFA) and foraging habitat. The following is a discussion of each.

Nest Habitat

Although the goshawk is considered a habitat generalist and uses a wide variety of forest types, it tends to nest in a relative narrow range of structural conditions (Reynolds et al. 1992, Squires and Reynolds 1997 In Kennedy 2003). Goshawks prefer mature forests with large trees, relatively closed canopies (60-90 percent) and open understories (Reynolds et al 1992, Hayward and Escano 1989, Squires and Reynolds 1997). Despite differences in some habitat characteristics, high canopy closure and tree basal area at nest areas were the most uniform habitat characteristic between study areas in northern Idaho and western Montana (Hayward and Escano 1989 *In* Kennedy 2003). Goshawk nest sites include the nest tree and approximately 40 acres around the nest (USDA-FS 2007) and breeding areas often contain several alternate nests that are used over several years and are usually located within ¼ mile of each other (Roberson et al. 2003). Key findings in the literature that characterize nest areas include; 1) goshawks nest in a variety of forest types throughout their range, 2) in general, the nest area vegetation is described by a comparatively narrower range of structural characteristics than the PFA or foraging area and includes mature forests with larger trees and relatively closed canopies (50-90 percent), 3) Average size of the nest area varies, and 4) in west central Montana, goshawks selected nest stands of mature and older forest that were approximately 40 acres in size and were surrounded by a mix of younger and non-forested habitat (Clough 2000 In USDA-FS 2000).

Post-fledgling Habitat

The post fledgling area (PFA) surrounds the nest area and is defined as the area used by the family group from the time the young fledge, until they are no longer dependent on the adults for food (Roberson et al. 2003). During the fledgling-dependency period (4 to 6 weeks) the activities of young are centered near their nests, with the distances that they may move from the nest increasing over time (Roberson et al. 2003). These areas may be of importance to fledglings by providing prey items on which to develop hunting skills, as well as cover from predators and prey. The Northern Region recommends that each pair of nesting goshawks should be provided with a 420 acre PFA within their home range. Based on habitat and occupancy data collected in northern Idaho, Moser 2006 (In USDA FS 2007) recommends maintaining at least 40 percent of the PFA in trees greater than 5 inches dbh with >50 percent canopy cover, with at least 100 of those acres forming contiguous forest that encompasses the occupied nest site and nest stand. Although in the Northern Rocky Mountain Ecological Provinces, which includes the LNF, 70 percent canopy coverage should be maintained on sites capable of supporting higher tree canopy coverage (e.g. moist north slopes (USDA-FS 2007).

Foraging habitat

Goshawks are opportunistic predators that kill a wide assortment of prey varying by region, season, vulnerability, and availability. Main foods include small mammals, ground and tree squirrels, rabbits and hares, large passerines, woodpeckers, game birds, and corvids (Squires and Reynolds 1997). Goshawks are classified as prey generalists (Squires and Reynolds 1997) and typically forage on a suite of 8–15 species (Reynolds et al. 1992). Preferred goshawk foraging habitat varies in the literature (USDA-FS 2007), however key findings or conclusions that characterize goshawk foraging include; 1) size of the typical home range or foraging area for the goshawk (1409 to 8649) may vary depending on prey

abundance and availability, age and sex of the bird and local habitat conditions, 2) goshawk foraging areas are heterogeneous and may include mature forest, as well as a mix of other forest and non-forest components, and 3) that emphasis should be placed on creating or maintaining vegetation diversity and that a juxtaposition of seral stages including mature timber should be provided (USDA-FS 2007).

Landscape Considerations

The breeding season home range for the northern goshawk varies depending on sex and habitat characteristics (Squires and Reynolds 1997) and can range from 1250 acres to over 6000 acres (Squires and Reynolds 1997, Reynolds et al. 1992, Kennedy 2003) and several authors have suggested that forested habitat for the northern goshawk should be managed at both the landscape and stand levels to provide adequate foraging and nesting habitat (Reynolds et al. 1992, Newton 1989, Merrill 1989 *In* Kimmel and Yahner 1994). In order to meet all the nesting requirements of this species, the Northern Region goshawk guidelines recommend that at least 240 acres of nesting habitat should be maintained in patches of at least 40 acres per home range. Recommendations related to providing desired home range and PFA habitat include maintaining a mosaic of vegetation structural stages, or more specifically; 1) 4-17 percent with small diameter trees or seedling/sapling forest, 2) 6-66 percent in young forest 3) 11-66 percent in mature forest, 4) 37-69 percent of the area as mature forest with >=50 percent canopy cover, and 5) 7-11 percent in non-forest (shrub, forb, grass).

Existing Condition

Approximately 65 percent of the Northern Region provides habitat for the northern goshawk (Redmond et al. 2001 *In* Samson 2006a) and of this, the LNF contains 130,176 acres of suitable northern goshawk habitat (Samson 2006b).

Vegetation conditions prior to the Jocko Lakes fire included <1 percent openings or non-forest, 2 percent seedling forest, 36 percent young forest, and approximately 60 percent in older structural conditions (sawtimber and mult-aged >9 inches dbh).

Approximately 70 percent of the project area was moderately to severely burned during the Jocko Lakes fire. Because of this species requirement for a relatively closed forest canopy, much of this acreage no longer provides suitable nesting or PFA habitat. Another 25 percent to 30 percent of the project area were unburned or received a low intensity burn. Consequently areas may provide potentially suitable nest habitat, depending on the overstory mortality and changes in stand structure that occurred. Although many of these sites are below the 40 acre minimum nest size and/or 100 contiguous acre PFA minimum recommended for the Northern Region (USDA FS 2007).

Table 23 displays pre and post-fire landscape conditions on NFS lands within the project area, whereas Table 24 displays post-fire nest and PFA habitat under each of the alternatives. As can be seen from Table 23, the Jocko Lakes fire has altered landscape conditions by reducing mature forest and increasing the amount of seedling/sapling habitat. Because the goshawk often selects landscapes with a predominance of mature forest (large diameter trees) with relatively closed canopies (Reynolds 1992), and considering that available mature forest has been reduced by almost 35 percent, these changes in landscape conditions are expected to reduce the suitability of the project area as goshawk nest and PFA habitat both in the short and long-term.

Table 23: Pre and Post fire Northern Goshawk Landscape Conditions

Habitat	Recommended[a]	2008 Pre-Fire Condition[b]	2008 Post-Fire Condition[c]
	%		
Non-Forest	7-11	<1	<1
Seedling/Sapling (<5" dbh)	4-17	34	46
Pole (5-9" dbh)	6-66	5	12
Mature and Multi-Structure (>=9 inches dbh)	37-69	60	40

[a] –recommended in USDA-FS 2007
[b] – Pre-fire conditions based on fsveg data
[c] – Post-fire conditions based on ba mortality and conditions identified in the vegetation report

In 2007, goshawk surveys were conducted in old growth stands within and adjacent to the project area in the vicinity of Seeley Lake and in the Hidden Lake area (immediately south of the project area). While a single goshawk was detected in the Hidden Lake area in 2006, no birds were detected in subsequent surveys (2007) (USDA-FS 2008b). Surveys were also conducted in 2008 within blocks of mature and old growth forest that had not been severely or moderately burned and were likely to contain suitable nest habitat. A total of 40 survey points were sampled at five different locations across the project area in 2008. No goshawks were detected during this effort and the closest known goshawk territory occurs approximately six miles east of the project area.

Environmental Consequences

Potential effects to the northern goshawk would be evaluated by looking at changes in nest, foraging and post-fledgling habitat. Because fire conditions have greatly altered canopy closure, suitable habitat is based on fire severity data and associated overstory mortality, as well as site level vegetation conditions. Based on this information, the following conditions were used to identify goshawk nest and PFA habitat.

Suitable Nest Habitat - mature and multi structure stands with <50 percent ba mortality,

Suitable Post Fledgling Habitat – pole, mature and multi-structure stands with <50 percent ba mortality

Using the above definitions, suitable nest and PFA habitat were identified for each alternative (See Table 24). Discussion of alternative effects is provided below. Foraging habitat is not displayed in Table 24, because there is expected to be little difference between alternatives.

Table 24: Suitable Alternative Goshawk Habitat

Habitat Component	Alternative 3		Alternative 5	
	Acres	%*	Acres	%*
Nest habitat	1798	24	1867	25
Post-fledgling habitat	2005	27	2074	28

*– percent of project area

The minimum recommended size for a northern goshawk nest site is 40 acres, although most breeding areas contain several alternate nest sites within ¼ mile of each other and many nest areas are 100 acres or more acres in size. Additionally the recommended size for a PFA area is 420 acres (USDA-FS 2007). As a result, it is somewhat deceiving to look only at the total acres of habitat, because some areas are too small to provide large enough blocks of suitable habitat. In order to more accurately display habitat conditions, a GIS analysis was completed to identify blocks of habitat large enough to provide suitable habitat and

Table 25 displays the total acres and number of blocks that are 40 acres or more in size. Because the nest and PFA areas were combined, the total block acres in Table 25 exceeds the total individual acres for either nest or post fledgling habitat displayed in Table 24.

Table 25: Blocks of Suitable Goshawk Nest and PFA Habitat.

Suitable nest and post fledgling habitat	40-100 acres	100-250 acres	250-411 acres
Acres (# of blocks)	265 (4)	610 (4)	1618 (5)

As can be seen from Table 25, there are a total of 13 blocks of habitat large enough to meet the 40 acre minimum identified for the Northern Region (USDA-FS 2007), although only nine blocks are large enough to provide adequate habitat for alternate nest sites (100 acres). Additionally the largest block of combined nest and PFA habitat is 411 acres, which is below the preferred size necessary to meet PFA requirements. So while potentially suitable nest and PFA habitat occurs on approximately 25 percent of the project area, block size of available habitat is at the low end of what is preferred by this species. As a result, available post-fire nest and PFA habitat within the JLFS project area is considered marginal and although nesting and brood rearing could occur, foraging would be expected to be the primary use of the project area by the northern goshawk in the short (5-10 years) and long-term (>10 years).

Because recommendations for this species include minimizing human conflict within nest areas, road management and access within blocks of suitable habitat were assessed and are displayed in Table 26. Effects by alternative are discussed below.

Table 26: Roads into Suitable Northern Goshawk Habitat

Roads within blocks of nest and PFA Habitat	Alternative 5	Alternative 3
Total Existing Roads	14.1 miles	
Existing Open Roads	11.0	
New Road Construction	0	0.7 miles
Road Decommissioning and Storage	0	2.6 miles
Short Term Road Density (2009-2011)	1.2 mi/mi^2	1.3 mi/mi^{2a}
Long Term Road Density (2012-2028)	1.2 mi/mi^2	1.0 mi/mi^{2b}
Long Term Open Road Miles (mi/mi^{2b})	11 (1.0)	9.0 $(0.8)^b$

[a] – change from alternative 5 due to new road construction
[b] – change from alternative 5 due to road decommissioning/storage

Direct and Indirect Effects

Effects Common to Both Alternatives

No green trees would be salvaged and although some live trees would be harvested for skyline corridors and new road construction, they would not reduce crown closure enough to make substantial differences in foraging habitat and existing foraging habitat would remain unchanged under both alternatives.

While the northern goshawk utilizes a diversity of habitats, it frequently selects landscapes that are characterized by relatively closed canopy mature forest for nesting and diverse landscapes and structural conditions for foraging (Reynolds et al 1992, Samson 2006a, Reynolds 2006). So while potentially suitable nesting, PFA and foraging habitat continue to occur within the project area, as shown in Table 23, the Jocko Lakes fire has completely altered forested conditions and the project area currently provides a more open and fragmented landscape than existed prior to the 2007 fire. As a result, neither alternative is

expected to provide the landscape conditions preferred by the northern goshawk (Samson 2006a, Reynolds et al 1992) for nesting or foraging.

Alternative 5 (No Action)

Because there are no federal actions proposed under this alternative, there are no direct effects anticipated, although indirect effects to habitat are anticipated. While all existing nest and PFA habitat have at least 50 percent canopy closure, almost one quarter of the suitable habitat has fire-related mortality on up to 50 percent of the site, while other areas have small but scattered pockets of mortality. Within the next 30 years it is anticipated that most of the fire-created snags would fall down and this would result large quantities of downed woody debris within remaining suitable habitat. Opening up of the canopy would also result in increased levels of tree and shrub regeneration and the long-term effect would be that post-fire suitable habitat would be characterized by more complex vertical structure with multiple canopy layers. Since the habitat of many prey species are linked to structural habitat components such as snags, downed wood, and vegetative diversity in the understory (Reynolds et al 1992), overall this increase in structural diversity is expected to improve goshawk foraging habitat, but due to less cover overall, goshawk use in the area is expected to be reduced.

Roads and road density within suitable goshawk habitat are displayed in Table 23 and because there are no treatments proposed, there would be no change in the level of roads or human access under this alternative.

Alternative 3 (Modified Proposed Action)

Direct effects include disturbance and possible mortality during timber harvest road construction and maintenance and supplemental planting. Although there are currently no known active nests, goshawks utilizing the area for foraging could be adversely affected by the noise and human presence associated with these activities. However effects would be limited to the implementation period (2009-2012) and would be short-term in nature. Also if any goshawk nests were established during project implementation, the following project design features would be implemented 1) a wildlife biologist would be notified and management activities would be altered if necessary so that protection measures can be implemented and 2) a 40 acre no activity buffer would be placed around active nests to reduce disturbance and maintain suitable habitat conditions at the nest site. Additionally, implementation of the BBW seasonal restriction (no harvest between 4/1 and 6/30) would reduce potential disturbance during much of the nesting and PFA period. Collectively these design features would help to ensure the nest site and post-fledgling area received minimal disturbance and reduce the likelihood that that there would be a reduction in nest site productivity.

Approximately 72 percent of suitable nest and PFA habitat on NFS lands within the project area would be left un-treated under this alternative and effects on this acreage would be similar to that described under Alternative 5. Salvage harvest would occur on approximately 28 percent of the suitable nest and PFA habitat. Because skyline yarding in combination with fire-related mortality may reduce suitable nest and PFA habitat below desired levels (Samson 2006a) it is possible that both nesting and PFA habitat would be reduced by approximately 1 percent (69 acres) under this alternative. While this would not reduce the total number of blocks of suitable nest/PFA habitat (Table 25), it would reduce a 271 acre block to approximately 200 acres. Also because salvage would reduce medium and large diameter snags, it is likely that up to 29 percent of the nesting and PFA habitat would provide suitable, but less preferred structural conditions than alternative 5. Because goshawks have been found to re-occupy sites following harvest, (Mahon and Doyle 2005), any reduction in the quality of nest habitat is expected to be short-term in nature.

As shown in Table 26, blocks of suitable goshawk habitat currently contain a total of 14.1 miles of total roads and 11.1 miles of open roads. Under Alternative 3, a total of .7 miles of new road construction would occur within suitable goshawk habitat. As a result over the short term (2009-2012) during project implementation, total road density would increase to 14.8 miles for a total road density of 1.3 mi/mi^2. However because these roads would be closed during implementation and permanently closed within 1 season following completion of the project, there would be no change in open road density. Also following implementation, 2.6 miles of existing roads would be decommissioned or put into storage for at least 20 years. As a result over the long-term both total and open road density within suitable goshawk habitat would be reduced under this alternative (see Table 26).

Fragmentation of habitat has been identified as a threat in some areas. However proposed salvage is widely scattered. Also a live overstory would be retained on all sites treated and considering that over 77 percent of the project area would be unaffected by treatment, it is not anticipated that proposed timber harvest activities would fragment habitat to the point that the northern goshawk would be adversely affected. Additionally Woodbridge and Detrich (1994) in their evaluation of territory occupancy and habitat patch size, found that while most goshawk territories were associated with larger remnant patches, they continued to nest in relatively high densities (0.57-1.07 territories/250 aces) in areas affected by timber harvest and forest fragmentation.

While effects of forest fragmentation from proposed timber harvest are expected to be temporary in nature, long-term effects such as increased predation or competition may occur along permanent openings and new roads, which have breaks in the Forest canopy and a well defined herbaceous layer. Proposed activities that may increase the amount of permanent edge and possibly reduce interior habitat under this alternative include four miles of temporary and short-term spec. road construction. In addition to the acreage affected by the treatments (10 acres), it is expected that edge related effects such as increased nest predation may occur for an additional 300 ft into the Forest (Paton et al 1992) and that proposed new road construction may result in edge related effects on up to 320 acres. However when evaluating potential effects of fragmentation, landscape characteristics such as the amount of intact forested and non-forested habitat, need to be considered. For example, while Robbins et al. (1989) identified a minimum tract size for a number of breeding birds, he found that for most area-sensitive species, the relationship between the probability of occurrence and area is significant only for forests that are greatly isolated (e.g. less than 33 percent forest within 2 km^2). This is a consideration on the Lolo NF and due to the predominately forested nature of the project area, potential edge related effects from new road construction would be expected to be reduced.

Cumulative Effects

Effects Common to Both Alternatives

Potential cumulative effects to this species include any activities that reduce forest cover or preferred structure including wildfire, road construction, private land development, firewood harvest, and timber harvest, as well as forest activities that could result in disturbance (See Appendix D). The environmental baseline or 2008 habitat displayed in Table 27 reflects habitat conditions that have resulted from these past activities (prior to the fire). Alternative conditions in 2012 reflect; 1) on-going and remaining non-federal salvage (6400 acres) since the 2007 fire, and 2) approximately 400 acres of partial harvest associated with the Hidden Lake Fuels Project. Cumulatively during the analysis period (2008-2012) it is anticipated that approximately 6700 acres of non-federal salvage and pre-approved NFS harvest would occur under both alternatives.

Table 27: Cumulative Effect Summary

Northern Goshawk Habitat	2008		Reduction in Suitable Habitat		2012 Alt 3		2012 Alt 5	
	Acres	%[a]	Acres	%[b]	Acres	%[a]	Acres	%[a]
Nest habitat	6,822	17	236	3	6,586	16	6,655	16
PFA Habitat	11,565	29	433	4	11,132	27	11,201	28

[a] - % of the project area
[b] - % of the habitat component

By 2012 it is estimated that approximately 70 percent of the analysis area would have been affected by timber harvest including over 95 percent of Plum Creek lands, 62 percent of State lands and approximately 52 percent of NFS lands. However because over 80 percent of the non-federal salvage occurs in areas that were moderately to severely burned and considering much of the Plum Creek lands did not provide suitable nest habitat prior to the fire, only a 3 percent reduction in nest habitat and 4 percent reduction in PFA habitat are anticipated (See Table 27). As a result and considering that changes in landscape conditions from the Jocko Lakes fire (described previously) are expected to reduce the suitability of the area for goshawk nesting, potential cumulative impacts to the goshawk and their habitat are expected to be reduced under both alternatives.

Current activities such as firewood collection, road maintenance, dispersed recreation, mushroom collection and previously approved noxious weed treatment along road corridors would continue to occur. However much of this activity would be concentrated along open roads, many of which already have year-long access. As a result, the level of disturbance is not expected to increase and potential disturbance to goshawks would be minor. It is also anticipated that there would be occasional wildfire suppression and should it occur, this would be a source of short-term disturbance. Although no private land development is in progress, private land use patterns would be expected to continue at past levels and due to the large open road density on these lands, goshawk use and potential impacts would be minor.

Alternative 3 (Modified Proposed Action)

In addition to cumulative effects described above, Alternative 3 would reduce goshawk nest and PFA habitat by 69 acres and increase disturbance on the 1648 acres proposed for treatment.

Summary of Effects and Determination

Alternative 5 (No Action)

Because there are activities proposed, implementation of Alternative 5, **is not expected to cause a local or regional change in habitat quality or population status for the northern goshawk.**

Alternative 3 (Modified Proposed Action)

Implementation of this alternative would reduce nesting habitat on 69 acres and may result in possible mortality or disturbance to the northern goshawk. However based on the above analysis and the following rationale, particularly the continued availability of suitable habitat within the project area, Forest and Region, implementation of Alternative 3 **May Impact individuals or habitat, but is not expected to cause a local or regional change in habitat quality or population status.**

- Suitable habitat has been surveyed and there are no known goshawk nests within the project area. Also project design features are in place to protect any new nests established and reduce potential

impacts during the breeding season (no timber harvest between 4/1 and 6/30). As a result potential impacts related to nest production and success are expected to be greatly reduced.

- Over 95 percent of existing nesting and PFA habitat within the project area and would continue to provide suitable habitat conditions. Also habitat would continue to exist within all affected watersheds.
- Reductions in total and open road densities and associated human access are expected to improve goshawk habitat over the long-term.
- The Jocko Lakes fire has greatly altered landscape conditions (See Table 20) preferred by this species, which is expected to reduce goshawk use and reduce potential conflicts with proposed activities.
- A Region-wide assessment (Samson 2006b) of goshawk habitat has indicated the following:
    - Goshawk habitat in R1 is abundant and well distributed where it occurs naturally, and more forest, and therefore nesting habitat, exists on today's landscape than what occurred historically.
    - There have been substantial increases in connectivity for forested habitat since Euro-American settlement.
    - The level of timber harvest of the forested landscape in R1 is insignificant in regard to altering goshawk habitat at the population scale.
    - No demographic information exists to suggest a decline in goshawk numbers.
    - Not a single known nest site in R1 is isolated from other known nests by more than the goshawks' estimated dispersal distance.
    - A comparison of habitat estimates for maintaining viable populations indicates that given the natural distribution of habitat, each Forest in R1 has an excess of available goshawk habitat.

Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

Because the current availability of nesting, foraging and post-fledgling habitat and considering there is no anticipated reduction in nest productivity, the proposed activities would not alter viable populations of northern goshawks. As a result both alternatives comply with Forest Plan direction to provide habitat for viable populations of all indigenous wildlife species (USDA-FS 1986 p. II-1) and are consistent with National Forest Management Act requirements to provide for a diversity of animal communities (16 USC 1604((g)(3)(B); also see 36 CFR 219.10(b): and FSM 2670.12. Additionally due to proposed road management and decommissioning/storage, Alternative 3 is consistent with Forest Plan direction related to minimizing roads to meet wildlife needs (USDA-FS 1986 p. II-2)

SENSITIVE SPECIES

Fisher

Analysis Area and Information Used

Analysis related to the fisher included looking at potential effects to individuals, changes in the amount and quality of denning, foraging and riparian habitat and due to this species susceptibility to trapping,

changes in access and potential conflicts with humans. Information used in this analysis includes life history, status, trend and distribution information contained in Fisher Biology and Management in the Western United States (Heinemeyer and Jones 1994) and species specific habitat information, as well as Forest and Regional habitat data contained in Samson (2006a and 2006b). Fisher habitat was identified and evaluated using information contained in the LNF timber and stand database (TSMRS) and GIS data related to vegetative conditions, fire severity, old growth stand and landscape structural characteristics, past management, road density, and stream and riparian habitat. Because of this species dependence on standing and downed woody debris (Heinemeyer and Jones 1994), pre and post-fire snag and DWD data discussed previously and changes in human access were evaluated.

The JLFS project area was used to assess the existing condition and direct and indirect effects to this species. This area was chosen because it contains preferred forest communities including old growth, as well as riparian forest and contains an adequate mix of habitats utilized by fisher. Additionally the mix of burning conditions and forest and non-forested structural conditions and past management activities are representative of those found on the landscape. The cumulative effects area for this species includes the 63 square mile sub-watershed area identified previously in this document. This area was selected so that potential impacts within this species home range could be adequately assessed.

Species Status, Preferred Habitat and Historical Condition

Fisher are probably the rarest forest carnivore in western Montana, where they are considered a State species of concern (Natureserve 2008). Based on limited research, fishers in northwestern Montana were most often found in moist grand fir and cedar habitat types (Heinemeyer 1993). Although fisher are selective in their use of habitats, home ranges typically encompass a diversity of plant communities and in the west, fisher are generally found in conifer dominated forests containing a diversity of habitat types and successional stages (Heinemeyer and Jones 1994). Jones (1991 *In* Samson 2006b) found that the fisher preferred old growth and mature forests in summer (92 percent and 74 percent of resting and hunting sites respectively), young and old growth in winter and had a strong affinity for riparian areas in both seasons. In Montana, re-introduced fishers preferred low-elevation mesic forests, especially riparian areas and dense young mixed-conifer stands (Heinmeyer 1993 *In* Carroll et al. 2001), with mixed conifer and mixed confer hardwood types generally being favored (Carroll et al 2001).

While fisher appear to use many different habitats, any habitat used must provide overhead cover at the stand or patch (site) scale (Samson 2006a) and the habitat relationship model for the fisher for the Northern Region requires a minimum of 40 percent canopy closure on both winter and summer habitat (Samson 2006a). Sufficient overhead cover in foraging habitat may be provided by either tree or shrub cover (Samson 2006a). Habitat use by fisher at the patch or site scale can be determined by the structural conditions on a site and Weir and Harestad (2003 *In* Samson 2006a) found that natal or den sites and resting sites were characterized by larger diameter trees (18” dbh) and larger amounts of DWD (31”dbh).

The fisher feeds on snowshoe hares, porcupines, carrion, squirrels, small mammals and birds (Banci 1989, Powell and Zielinski 1994 *In* USDA-2007a). Banci 1989, and Powell and Zielinski 1994 believe the best fisher habitats are multi-aged stands interspersed with small openings and containing riparian habitat. Complex understory structure with abundant woody debris may also be an important habitat factor. Documented den sites have occurred in cavities of live or dead trees with some forest structural diversity (forb/shrub cover, downed wood and multiple canopy layers), which helps to maintain a prey base of snowshoe hare, porcupine and a variety of small mammals (Ruggiero et al. 1994). Average home range size varies from 19-33 sq. mi. for males and 7-12 sq mi. for females (Heinemeyer 1993, Jones and Garton 1994). Young are born in the den in early March to mid-April, weaned by mid-May to mid-August (at 2.5 to 4 months old), and separated from their mother in early August to mid-October (at 5 months of age) (Natureserve 2008).

In Montana this species is classified as a furbearer and as such, population numbers are managed by the Montana Department of Fish, Wildlife and Parks. The species is legally trapped under a limited quota system, allowing for take of seven individuals statewide. A review of trapping records for the counties that encompass the LNF show 32 fisher harvested from 1996 through 2002, with all trapping activity occurring in Missoula and Mineral Counties (http://fwp.mt.gov/hunting/planahunt/harvestreports.html#furbearer). Records since 2003 are not available, although recent records of fisher tracks and incidental captures have been reported during research activities west of the project area, near Lolo Pass on the Powell R.D.

Conservative estimates of fisher habitat on the LNF show that available habitat is relatively abundant with an estimated 530,782 acres and 159,136 acres of winter and summer habitat respectively. This is well above levels necessary to maintain a minimum viable population for this species (Samson 2006b).

Existing Condition

Prior to the Jocko Lakes fire, approximately 60 percent of the project area contained mature forest conditions, including approximately 1000 acres that were identified as existing or potential old growth (Green et al 1992). Because fisher are closely associated with forested riparian areas (USDA-FS 1994), lands in close proximity to water are preferred and approximately 20 percent of the project area occurs within a RCHA, with the primary drainages including Finley, Placid and Archibald Creeks.

Although a mosaic of burn intensities occurred within the Jocko Lakes fire perimeter, over 70 percent of both the project area and riparian habitat were moderately to severely burned and post-fire habitat conditions are displayed in Table 6. Because preferred mature forest has been reduced by 70 percent and considering that preferred sawtimber stands or stands characterized by trees >9 inches dbh have been reduced by 30 percent, the Jocko Lakes fire has altered landscape conditions within the project area and greatly reduced suitable fisher habitat. Most remaining habitat occurs on sites that were unburned (4 percent) or lightly burned (25 percent), which are scattered throughout the project area.

Environmental Effects

While fisher would utilize many different habitats, the Northern Region habitat relationship model requires a minimum of 40 percent canopy closure on both summer and winter habitat. Also because old growth and mature forest were typically selected for resting and hunting sites (Jones 1991 *In* Samson 2006b), only mature, multi-structure and old growth stands with 50 percent or more canopy closure were considered to provide summer habitat, whereas seedling/sapling stands with >50 percent canopy closure were considered suitable winter habitat (Heinemeyer and Jones 1994). Also because habitat at both the patch and site scale is determined largely by structural characteristics, old growth and potential old growth were considered preferred habitat. Finally because the fisher shows a strong affinity for riparian areas year-round, availability of and effects to riparian areas were assessed. The following is a summary of the habitat components which are displayed by alternative in Table 28.

- **Suitable Summer and Winter** – mature and multi-structure stands (not designated or potential old growth) with a minimum of 50 percent canopy closure
- **Suitable Winter Only** –Sapling stands with a minimum of 50 percent canopy closure;
- **Preferred Habitat** – Existing old growth with a minimum of 50 percent canopy closure.
- **Riparian Habitat** – Suitable or preferred habitat within RHCAs.

Direct and Indirect Effects

Effects Common to Both Alternatives

Although there would be some differences (described below) between alternatives in terms of the habitat structure, because proposed salvage only removes dead and dying trees, and considering there are no sites where canopy closure would be reduced to levels that are unsuitable, the amount of suitable fisher habitat would be the same under both alternatives.

Table 28: Alternative Post-fire Fisher Habitat Summary

Habitat Component	Alternatives 3 and 5	
	Acres	% of Project Area
Suitable Summer and Winter	1470	20
Suitable Winter Only	1202	16
Existing Old Growth	203	3
Total Suitable Habitat	3074	42
Suitable Riparian Habitat	322	4

Prior to the Jocko Lakes fire, approximately 90 percent of the project area provided suitable summer or winter habitat, whereas old growth and potential old growth was provided on 13 percent of the area. Following the 2007 fire, suitable fisher habitat was reduced by approximately 50 percent. Additionally, suitable riparian habitat, which is used as travel corridors, has been reduced by almost 65 percent. Collectively this large reduction in both the amount and quality of fisher habitat would be expected to greatly reduce use of the project area by fisher under both alternatives.

Because there are no treatments proposed within RHCAs or existing old growth under Alternative 3, suitable habitat in these areas would be unchanged under both alternatives. Similarly although a few acres of winter habitat are proposed for treatment (<1 percent of the project area), there would be no significant difference between alternatives in this habitat component.

Although Alternative 3 would reduce the potential for human conflicts due to increased remote habitat and reduced open road density, because the project area presently only provides marginal habitat, use of the project area would likely be reduced and trapping related mortality is not expected to change due to proposed activities under either alternative.

Alternative 5 (No Action)

Because there are no treatments proposed, there would be no direct effects to fisher under this alternative. Although there would be no change in the amount of suitable or preferred habitat in the short term (less than 10 years), due to the increased amounts of downed woody debris that would occur in the next 30 years, it is expected that the quality of understory habitat would improve over the long-term (>10 years) under this alternative. However, it would take decades for overhead cover to become established in severely burned areas.

Because there would be no change in road access under this alternative, potential conflicts with humans would be unchanged.

Alternative 3 (Modified Proposed Action)

Direct effects in the form of disturbance could result under this alternative due to proposed timber harvest, road construction and maintenance and supplemental planting. However over 70 percent of

suitable fisher habitat would be unaffected and considering use of the project area by fisher is expected to decline, the possibility of disturbance and/or mortality from proposed activities is remote.

A total of 582 acres of suitable fisher habitat would be salvaged under this alternative, including 192 acres (32 percent) that were moderately burned, 281 acres (48 percent) that were lightly burned and 109 acres that were unburned (20 percent). Although there would be a small reduction in live canopy on 61 acres that would be skyline logged, it is expected that these areas would continue to provide suitable habitat (i.e. maintain >50 percent canopy). Also while levels of future downed woody debris and the overall quality of habitat on the acreage treated would be reduced, with implementation of project design features, all sites would continue to provide levels of coarse woody debris consistent with suitable fisher habitat, as well as contain a preferred large tree component. So while there would be structural changes, there is no reduction in suitable fisher habitat (as identified by Samson 2006a) anticipated under this alternative.

Cumulative Effects

Effects Common to Both Alternatives

Trapping, increased road access and extensive clear-cutting especially in riparian areas (on private industrial forest lands), have all likely contributed to fisher population declines across the western U.S. Fishers were released in some areas of western Montana around 1959 and 1988 through 1991, to augment nearly extinct populations (Powell and Zielinski 1994 *In* USDA-2007a). The Montana FWP now regulates trapping, but fishers remain vulnerable to trapping pressure. Also the decreasing use of clear-cutting and riparian harvest may have stabilized the amount of fisher habitat in the state.

Past, present and reasonable foreseeable activities in and adjacent to the project area which may impact fisher and their habitat are described in detail in Appendix D and include; timber harvest, recreational use, land development, wild and prescribed fire, BAER activities, wildfire suppression, hunting and road building. Past timber harvest has occurred on approximately 65 percent of the analysis area and has affected over 95 percent of Plum Creek lands, and approximately 50 percent and 42 percent of State and NFS lands respectively within the analysis area. Most of this harvest involved regeneration cutting which also resulted in a reduction in mature cover and an increase in early structural forest conditions. Although past harvest has affected fisher habitat, the Jocko Lakes fire has greatly altered habitat conditions that currently exist within the analysis area.

Ongoing and anticipated future timber harvest is expected to occur on approximately 6700 acres within the analysis area, including 6400 acres of non-federal salvage and 400 acres previously approved federal harvest (Hidden Lake Fuels EA). Because only partial harvest treatments were approved in the Hidden Lake EA, habitat conditions would remain relatively unchanged. Also because most of the non-federal salvage occurs in sites that were moderately to severely burned, these areas would only provide marginal habitat conditions and potential impacts would be reduced.

Potential effects to preferred riparian habitat are evaluated by looking at changes at the amount of RHCA habitat affected and approximately 12 percent of the analysis area occurs within an RHCA. Of this, approximately 52 percent was affected by the Jocko Lakes fire, and of the acreage burned, over 80 percent was moderately to severely burned. While there would be no harvest within riparian habitat on NFS lands, approximately 10 percent of RHCAs would be affected by non-federal salvage. However, the large reduction in cover within riparian habitat resulting from the 2007 fire would be expected to reduce fisher use and potential impacts under both alternatives.

Approximately 40 percent of the analysis area has not been affected by the Jocko Lakes fire and although the quality of cover varies, approximately 70 percent of the NFS lands and 60 percent of the non-federal lands within un-burned portions of the analysis area currently consist of forested stands that would continue to provide fisher habitat.

Current activities such as firewood collection, dispersed recreation, mushroom collection and noxious weed treatment along road corridors would continue. While these activities may result in a short-term, localized source of disturbance to fisher, much of this would be concentrated along open roads and the level of disturbance is not anticipated to increase. It is also anticipated that there would be occasional wildfire suppression and should it occur, this would be a source of short-term disturbance. Private land development is anticipated and private land use patterns would continue, although due to the large open road density on these lands, potential for trapping related mortality would be unchanged.

Although there would be new road construction on non-federal lands, most of this would occur within areas that have been moderately to severely burned and potential disturbance related impacts would be low

Summary of Effects and Determination

Alternative 5

Because there are no activities proposed, Alternative 5 would have **No Impact** on the fisher or its habitat.

Alternative 3

Although proposed harvest of dead and dying trees would reduce stand structure on 1648 acres, with implementation of project design features that require retention of DWD and large diameter snags, there would be no reduction in existing suitable habitat. Also riparian habitat would be unaffected by treatment and considering that access and potential trapping pressure would be reduced over the long-term due to proposed road decommissioning/storage, Alternative 3 **May impact individuals or habitat, but would not likely contribute towards a trend in Federal listing or cause a loss of viability.**

Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

Because there would be little change in habitat suitability, both alternatives are consistent with Forest Plan direction to provide habitat for viable populations of all indigenous wildlife species (USDA-FS 1986 p. II-1), and with National Forest Management Act requirements to provide for a diversity of animal communities (16 USC 1604((g)(3)(B)); also see 36 CFR 219.10(b): and FSM 2670.12. Additionally due to proposed road management and decommissioning/storage, Alternative 3 is consistent with Forest Plan direction related to minimizing roads to meet wildlife needs (USDA-FS 1986 p. II-2)

Significance Factors

The analysis presented above provides detailed information on the life history, population trend, surveys and monitoring and limiting factors for the fisher, which is a Regionally Sensitive species for the Lolo NF. Although implementation of Alternative 3 may impact individuals of this species, based on the analysis provided, it would not result in a reduction in viability or a trend in federal listing.

Wolverine

Methodology and Analysis Area

Because the project area lacks suitable denning habitat (cirque basins) and because this species is strongly associated with low levels of population density and roads (Carroll et al. 2001), project level analysis

would focus on potential impacts to dispersing individuals including changes in foraging habitat (primarily big game) and potential for conflicts with humans. Information used in this analysis includes life history, distribution and status and trend information provided in USDA-FS (1994), as well as other research related to this species and its habitat (see reference section), pre-fire aerial photography, thermal imagery data, stand exam data, Northern Region Vegetation Mapping Project (R1-VMP) data, and field surveys and photos collected from project field visits. Potential for conflicts with humans were assessed using GIS data related to vegetation information contained in the LNF timber and stand database (TSMRS) and GIS data related to both stand and landscape vegetation and structural conditions, past management activity, forest-wide fire activity, old growth, road density and access and the availability of remote habitat.

The JLFS project area was used to assess the existing condition and direct and indirect effects for this species. Due to the large number of open roads and year-round human activity, the project area does not provide high quality den habitat. However this area contains big game and wolverine foraging habitat and levels of human activity are representative of those found across the landscape. The cumulative effects area for this species includes the 63 square mile sub-watershed area identified previously. This area was selected because it includes potential den habitat (based on the LNF habitat model) and is large enough to assess impacts to this species home range. This area also includes other lands that have not been affected by wildfire and may represent available suitable habitat for animals displaced by the Jocko Lakes fire.

Species Status, Preferred Habitat and Historical Condition

In 2000, the USFWS was petitioned to list wolverine under ESA. That petition was denied after the formal 90 day review, because the petition did not present substantial scientific information warranting listing of the wolverine in the contiguous U.S. (USDI-FWS 2003).

Wolverine populations in Montana were near extinction by 1920 (Newby and Wright 1955 *In* USDA-FS 1994). However due partly to reduced trapping of American martens (*Martes americana*), numbers increased in the western part of the state from 1950 to 1980 (USDA-FS 1994). The LNF encompasses MTFWP trapping Districts 1 and 2. Available trapping records indicate no wolverine have been legally trapped on the Missoula district from 1996 through 2005. Conversely, several wolverine have been legally trapped on the Seeley Lake Ranger District in recent years.

The wolverine is often characterized as a wilderness species whose persistence is linked to the presence of large areas of low human population density. Hash (1987 *In* Montana Field Guide) reported that wolverines in the Northern Rocky Mountain region were most often associated with fir, pine and larch, although aspen and cottonwoods in riparian areas were also used. Denning occurs in cirque basins and other high elevation, steep slope habitats (Carroll et al 2001). Wolverine dens are usually associated with large accumulations of snow around logjams, rocks, or boulders and are generally found at higher elevations well away from development or human activity. Based on trapping and sighting records, Carroll et al. (2001) modeled habitat for the wolverine, fisher, lynx and grizzly bear in the Rocky Mountains. His results indicate that high quality wolverine habitat is strongly associated with low levels of population density and roads and that den sites are often selected in remote cirques that retain snow cover late in the spring. This is also consistent with Copeland (1996 *In* Carroll et al 2001), who found that females selected natal den sites in glacial cirque basins, or at vegetation/rock interface at higher elevations.

Wolverine often do not “hunt” in the usual sense, but are opportunistic, eating anything edible they can catch, find, or steal. Ungulate carrion seems to be particularly important to wolverine in the winter (USDA-FS 1994). While the wolverine is a proficient predator capable of killing large ungulates, primarily in deep snow, they more commonly prey on smaller species such as snowshoe hares, cottontails,

ground squirrels, porcupines, marmots, skunks, and weasels (USDA-FS 1994). They also opportunistically consume berries, insects, fish, birds, and eggs. Because the wolverine often depends on unpredictable food sources (big game carrion), their home range is larger than other carnivores of similar size (Copeland 1996 *In* Carroll et al 2001) and can vary from 37 to 347 square miles (USDA-FS 1994). The combination of large area requirements and low reproductive rate also make the wolverine vulnerable to human-induced mortality and habitat alteration.

Hornocker and Hash (1981 *In* (Montana Field Guide 2008) found most wolverine use in Montana to occur in medium to scattered timber, while areas of dense, young timber were used least. Wolverines avoided clearcuts and burns, crossing them rapidly and directly when they were entered at all. Based on available research, primary limiting factors affecting wolverine appear to be undisturbed denning habitat, big game as a food source and trapping pressure.

Existing Condition

Although the LNF habitat model identifies potentially suitable den habitat west of the project area, wolverine core habitat on the Seeley Lake RD is largely restricted to the Scapegoat wilderness and other remote areas. Also based on Land Systems inventory database and some ground verification, cirque basins or similar landforms preferred by this species do not occur within the JLFS project area. As a result and considering the high level of human activity that occurs in and near the project area, large scale regeneration harvest that has occurred on Plum Creek lands, and considering over 90 percent of the project area was burned by the Jocko Lakes fire, the project area does not provide preferred habitat. Also dispersal habitat has been greatly reduced and use of the area by wolverine would be expected to be temporary or transitory in nature.

Environmental Consequences

Direct and Indirect Effects

Effects Common to Both Alternatives

Because the project area lacks quality denning habitat and considering this species often avoids burned areas (Hornocker and Hash 1981 *In* Montana Field Guide 2008), dispersal habitat and possible use of the project area by this species has been greatly reduced by the Jocko Lakes fire. Also because approximately 70 percent of the project area was moderately to severely burned and because it would take decades for these lands to recover, this reduction in suitable habitat and use is expected to continue over the long-term under both alternatives.

Indirect effects on foraging habitat under this alternative are similar to those for elk and although elk distribution and use is expected to shift both within and on lands adjacent to the project area, there is not expected to be a substantial decrease in elk numbers within the affected watersheds. As a result, the suitability of wolverine foraging habitat would remain relatively unchanged under both alternatives.

Alternative 5 (No Action)

Because there are no treatments proposed under this alternative there are no direct effects anticipated and anticipated indirect effects to foraging habitat are discussed above under effects common to both alternatives. Because the project has a high total and open road density and receives fairly heavy year-round human use, it currently provides marginal wolverine habitat. Also while there would be no change in access or road density under this alternative, potential conflicts with humans would be unchanged and this, in combination with fire related effects, would further reduce the suitability of the project area as dispersal habitat.

Alternative 3 (Modified Proposed Action)

Direct effects under this alternative include disturbance and possible mortality during harvest, road construction and maintenance and supplemental planting. Approximately 77 percent of the project area is unaffected by treatment. Considering that a reduction in suitable habitat due to the fire is expected to result in infrequent use, the likelihood of disturbance and/or mortality is remote. Potential impacts are further reduced, considering that wolverine often cross less suitable habitat during the cover of night (Hash 1987 *In* USDA-FS 1998), when proposed activities would be inactive. Effects to foraging habitat are described above under effects common to both alternatives. Because this alternative would reduce the total and open road density and increase the amount of remote habitat, it may reduce potential conflicts between humans and wolverine. Although as described above, wolverine use of the area is low.

Cumulative Effects

Cumulative effects to the wolverine would be evaluated by looking at all lands within the affected watershed area (40,536 acres). Rationale for selection of this area is provided under the Process section of this document and in addition, this area was selected because it includes 407 acres of suitable denning habitat (based on the LNF habitat model), as well as unburned lands that would provide adequate cover.

Effects Common to Both Alternatives

Past, present and reasonably foreseeable activities in and adjacent to the analysis which may impact wolverine and their habitat are described in detail in Appendix D and include; timber harvest, recreational use, land development, wild and prescribed fire and road building. Past timber harvest has occurred on approximately 65 percent of the analysis area and has affected over 95 percent of Plum Creek lands, and approximately 50 percent and 42 percent respectively of State and NFS lands within the analysis area. Most of this harvest involved regeneration cutting which also resulted in a reduction in mature cover and an increase in early structural forest conditions. Although past harvest has affected suitable habitat, the Jocko Lakes fire has greatly altered habitat conditions from what existed prior to the 2007 fire (See Table 6) and this large change in landscape condition is expected to reduce potential use of the area wolverine.

Non-federal harvest since the 2007 fire and remaining salvage on non-federal lands is expected to occur on approximately 5200 acres of Plum Creek lands and 1200 acres of State lands. In addition by 2012, approximately 400 acres approved in the Hidden Lake Fuels project would have been implemented. Because most of the non-federal harvest would occur on lands that have been moderately to severely burned, and considering the Hidden Lake project area does not provide quality habitat (USDA-FS 2008b), potential impacts to wolverine are expected to be low.

Although there would be new road construction on non-federal lands, most of this work would occur within areas that have been moderately to severely burned and potential disturbance related impacts would be extremely low.

Current activities such as firewood collection, dispersed recreation, mushroom collection and noxious weed treatment along road corridors would continue. While these activities may result in a short-term, localized source of disturbance to wolverine, much of this use would be concentrated along open roads and the level of disturbance is not anticipated to increase. It is also anticipated that there would be occasional wildfire suppression and should it occur, this would be a source of short-term disturbance. Although no private land development is anticipated, private land use patterns would continue and due to the large open road density on these lands would remain unchanged.

Although potential den habitat (based on the LNF habitat model) occurs within the analysis area, due to the high total and open road density and year-round human activity, the analysis area currently provides

low quality wolverine habitat. Also there are no future activities anticipated near potential den habitat (identified by the LNF model) and there are no impacts to den habitat anticipated.

Summary of Effects and Determination

Alternative 5

Because there are no activities proposed, Alternative 5 would have **No Impact** on the wolverine or its habitat.

Alternative 3

Although proposed salvage harvest would reduce stand structure on 1648 acres, there would be no reduction in existing suitable habitat. Also localized access and potential for interaction with humans would be reduced over the long-term and considering potential use of the project area by wolverine is low, Alternative 3 **May impact individuals or habitat, but would not likely contribute towards a trend in Federal listing or cause a loss of viability.**

Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

Because there would be little change in habitat suitability, both alternatives are consistent with Forest Plan direction to provide habitat for viable populations of all indigenous wildlife species (USDA-FS 1986 p. II-1), and with National Forest Management Act requirements to provide for a diversity of animal communities (16 USC 1604((g)(3)(B)) also see 36 CFR 219.10(b): and FSM 2670.12. Additionally due to proposed road management and decommissioning/storage, Alternative 3 would reduce human access and potential for conflicts, which is consistent with Forest Plan direction related to minimizing roads to meet wildlife needs (USDA-FS 1986 p. II-2)

Significance Factors

The analysis presented above provides detailed information on the life history, population trend, surveys and monitoring and limiting factors for the wolverine, which is a Regionally Sensitive species for the Lolo NF. Although implementation of Alternative 3 may impact this species, based on the analysis provided, it would not result in a reduction in viability or a trend in federal listing.

Northern Bog Lemming and Boreal (Western) Toad

Methodology and Analysis Area

Although the boreal toad disperses into upland habitat, both species rely on aquatic habitat and/or terrestrial areas with a high water table. As a result these two species will be analyzed together and potential effects to both species would be evaluated by looking at impacts to and changes in aquatic and riparian habitat. Although potentially affected upland habitat for the boreal toad would also be assessed. Information used in this assessment includes GIS data related to aquatic and riparian habitat, stand and landscape level vegetation information, data on roads and trails, past management and wildfire activity, future management activities and wildlife, soil and aquatic field surveys.

Because of their small home range and considering that potential impacts are most likely to occur as a result of site level impacts, the Jocko Lakes project area will be used to assess direct, indirect and cumulative effects for these two species. Expanding this area further would tend to “mask” effects of treatment.

Northern Bog Lemming

Species Status, Preferred Habitat and Historical Condition

The northern bog lemming is a small vole that occurs in small disjunct populations in the United States. Limited surveys have documented this species in a few locations in Washington, Idaho, Montana, Minnesota and New England (Reichel and Beckstrom 1993). In the United States the bog lemming is ranked as apparently secure, though it may be quite rare in parts of its range, especially at the periphery (Montana Field Guide 2008).

Montana is at the southern geographic boundary of northern bog lemming range (Natureserve 2008), where it is ranked as an imperiled species (S2) (Natureserve 2008). In Montana prior to 1992, the bog lemming was known to occur in a few locations in Glacier National Park and one north of Missoula (Rattlesnake drainage) (Hart et al. 1998 *In* Montana Field Guide). In the 1990s, increased survey efforts detected 11 more locations ranging from northwest Montana, south to Beaverhead County (just north of Lost Trail Pass) and east along the Rocky Mountain Front. Due to its rarity (6 to 20 occurrences), disjunct distribution and specialized habitat (described below), and considering the high intensity of survey required to detect this species (Reichel and Beckstrom 1993), the northern bog lemming has not been studied in detail.

Northern bog lemmings feed on grasses, sedges and other herbaceous vegetation, but also snails, slugs, and other invertebrates (Foresman 2001 *In* Montana Field Guide 2008). Nearly all of the documented occurrences in Idaho, Montana and Washington have been found in peat lands characterized by extreme abiotic conditions that inhibit the decay of organic materials, allowing the soil to hold large quantities of water and maintain a relatively stable environment for plant and animal species.

The northern bog lemming occupies burrow systems up to 12 inches deep as well as surface runways. Breeding occurs from May through August and young are born in nests that may be underground or on the surface in concealing vegetation. They feed on grasses, sedges and other herbaceous vegetation, snails, slugs and other invertebrates (West 1999, Foresman 2001 *In* (Montana Field Guide 2008). Patch size of typical habitat where northern bog lemmings have been found in Montana range in size from 1-340 acres, with 7 of 13 smaller than 10 acres. Individuals are thought to maintain a home range of less than one acre (http://imnh.isu.edu/digitalatlas/bio/mammal).

Long term road and trail creation and associated human disturbances, as well as overgrazing by livestock and logging are thought to be the primary factors that can have cumulative effects and potentially reduce viability over time (Reichel 1996; Hickman et al. 1999). Based on an evaluation of limited available information, Reichel (1993 *In* Natureserve 2008) made the following management recommendations intended specifically for Montana, but perhaps generally applicable to other areas as well; 1) maintain a 100 m buffer for management activities around riparian areas/corridors where sphagnum mats occur and 2) avoid human activities that alter streamflow in drainages where sphagnum mats are present.

Existing Condition

Surveys for this species have not been conducted within the JLFS project area and the closest known occurrence is an historical record (1978) from Missoula County, approximately 25 miles southwest of the project area (Montana Natural History Tracker). There are approximately 70 acres of potentially suitable wetland/wet meadow habitat within the JLFS project area. Most of this occurs in the northwest portion of the project area in the Archibald and Beaver Creek drainages.

Boreal (Western) toad

Species Status, Preferred Habitat and Historical Condition

This toad is a subspecies of the western toad, *Bufo boreas*, which was historically widely distributed across the Pacific Northwest and Rocky Mountains. Adult boreal toads are largely terrestrial and are considered habitat generalists that use a variety of habitats. They generally breed in lakes, ponds and slow streams and roadside ditches, where they prefer shallow areas with mud bottoms (Montana Field Guide 2008). Egg laying usually takes place one to three months after the snow melts (Reichel and Flath 1995, Werner et al., 2004 *In* Natureserve 2008). These toads may wander miles from their breeding sites through coniferous forests and subalpine meadows, lakes, ponds and marshes (Werner et al., 2004). Generally western toads are active during the day and night, with the active period generally running from April or May through October in Montana (Montana Field Guide 2008).

In Montana, this toad occurs in mountainous terrain on both sides of the continental divide. These toads were once common and widespread in western Montana, but they are now uncommon and few breeding populations were found in recent surveys on six National forests in the state (Werner et al., 2004). Declines have also been noted in adjacent states (Reichel and Flath 1995). There are no clear reasons for these declines, and possible causes range from acid rain, pesticides, and parasites, to ozone depletion, habitat loss and climate change. Declines have even been noted in remote locations such as wilderness areas and national parks.

Existing Condition

Potentially suitable breeding habitat is widespread and the project area contains over 70 acres of swamps and wetlands, over 30 miles of stream and numerous roadside ditches.

This species has been documented at an Inez Lake wetland approximately 5 miles north of the project area. There have been no surveys for this species and although not documented within the project area, suitable habitat is widespread. However considering that over 90 percent of the project area and over 60 percent of lands within 300 feet of a stream or water body were burned during the Jocko Lakes fire, the quality of dispersal habitat would have been reduced.

Environmental Consequences

Direct and Indirect Effects

Alternative 5 (No Action)

Because there are no activities proposed under this alternative, there are no direct effects to either species anticipated. Indirect effects to both species may include increased levels of downed woody debris and cover in riparian, wetland and upland areas. Riparian and upland areas that were unburned and lightly burned would continue to provide suitable habitat for both species.

Alternative 3 (Modified Proposed Action)

Western Toad

While there is no harvest proposed near preferred aquatic breeding habitat or within RHCAs, because western toads have been documented traveling more than 1.5 miles from aquatic habitat following their breeding season, mortality and disturbance to this species could result under this alternative. However considering some low cover and DWD would be maintained on all sites proposed for treatment, areas affected by harvest would continue to provide low cover and could likely be utilized for dispersal. Indirect effects to western toad breeding habitat could also occur if there is increased sediment delivery to

wetlands and waterways resulting from proposed road work or timber harvest. However there are no treatments proposed within aquatic or riparian (RHCA) areas. Also Best Management Practices (BMPs) would be in place to protect water quality and fish habitat and considering that INFS (USDA-FS 1995) protection measures would be implemented to protect waterways and wetlands, water quality related impacts should be minimal.

Alternative 3 (Modified Proposed Action)

Northern Bog Lemming

Vegetation treatments can impact the bog lemming by causing direct mortality or through loss or modification of cover (summarized in Hickman et al. 1999). However because there are no activities proposed within any wet meadows or riparian areas, and considering there would be no increase in motorized use or other human recreational activity, there are no direct or indirect effects anticipated.

Cumulative Effects

Northern Bog Lemming

Because there are no direct or indirect effects anticipated, there would be no cumulative effects to this species under either alternative.

Western Toad

Effects Common to Both Alternatives

Because of this small home range, cumulative effects would be evaluated by looking at potential impacts to suitable habitat on all lands within the analysis area. The Western toad is sensitive to environmental changes caused by human development and disturbances of habitat (Leonard et al 1993). As a result, past timber harvest, road construction and maintenance, loss of wetlands due to development, periodic flooding, and fires and firefighting, have all likely affected this species and its habitat within the project area. Periodic road maintenance, specifically cleaning out roadside ditches, may also have impacted western toads if tadpoles were present and dependent on ditch water.

Although future activities (See Appendix D) under this alternative would affect approximately 800 acres of upland habitat, only 20 acres of RHCAs and riparian habitat preferred for breeding would be affected by non-federal activities. Because these activities largely occur away from breeding habitat and because associated use is believed to be scattered and in-frequent, there is only a remote possibility that impacts to the western toad would occur.

Summary of Effects and Determination

Alternative 5

Because there are no activities proposed under this alternative, implementation of Alternative 5 would have **No Impact** on the western toad or northern bog lemming.

Alternative 3

Western Toad - Although implementation of Alternative 3 may modify upland habitat and result in a short-term increase in use of existing roads and potential for mortality to toads dispersing from breeding habitat, because there are no treatments proposed within preferred breeding habitat, the potential for disturbance or mortality is extremely remote. As a result and considering cover would be retained within upland habitat dispersal habitat implementation of Alternative 3 **May Impact individual western toads**

or their habitat, but would not contribute in a trend towards Federal listing or cause a reduction of viability.

Northern Bog Lemming – Because there are no direct, indirect or cumulative effects to this species, implementation of Alternative 3 would have **No Impact** on this species or its habitat.

Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

Because there are no activities proposed within preferred breeding habitat, both alternatives are consistent with Forest Plan direction to provide habitat for viable populations of all indigenous wildlife species (USDA-FS 1986 p. II-1), and with National Forest Management Act requirements to provide for a diversity of animal communities (16 USC 1604((g)(3)(B)) also see 36 CFR 219.10(b): and FSM 2670.12.

Significance Factors

The analysis presented above provides information on the life history, population trend, surveys and monitoring and limiting factors for the northern bog lemming and boreal toad, which are Regionally Sensitive species for the LNF. Although implementation of Alternative 3 may impact the boreal toad, based on the analysis provided, it would not result in a reduction in viability or a trend in federal listing.

Bald eagle

Methodology and Analysis Area

Because of the absence of bald eagle nesting habitat and the lack of concentrated winter foraging habitat, this analysis will address potential foraging and roosting habitat near Hidden Lake and Beaver Creek. Information used includes forest and district-wide nest, observation and monitoring data, past and future management activity, and GIS information related to roads and trails and streams and aquatic habitat and wildlife, fisheries and hydrologic field surveys.

Because the closest eagle nest is over a mile away, the project area was selected to assess direct and indirect effects. The cumulative effects area includes the 63 square mile sub-watershed area identified under Process section of this document. This area was selected because it includes suitable habitat around Hidden Lake and Seeley Lakes and because potential impacts to water quality are better assessed across affected watersheds.

Species Status, Preferred Habitat and Historical Condition

Until recently the bald eagle (*Haliaeetus leucocephalus*) was listed as Federally Threatened under the Endangered Species Act. However effective August 8th, 2007, the US Fish and Wildlife Service officially de-listed the bald eagle and this species has been added to the Northern Region (R1) sensitive species list. The Forest Service would continue to follow management direction outlined in the Montana Bald Eagle Recovery Plan (1994) and this species is also protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.

Bald eagles are associated with large bodies of water and major river drainages, which provide most of their foraging opportunities. Wintering habitat may include upland sites and nesting areas are generally located within larger forested areas near lakes and rivers. In Montana, bald eagles nest in stands containing large trees (>30 inches dbh) with uneven canopy structure and in direct line of sight of a river or lake generally less than one mile away (Montana bald eagle working group 1991). Nest site selection is dependent upon maximum food availability and minimum disturbance from human activity. Eagles are opportunistic feeders, preying on fish, waterfowl, small mammals and carrion (Montana Field Guide

2008). During migration and at wintering sites, eagles tend to concentrate on locally abundant food and often roost communally.

General objectives of habitat management for Bald Eagles in Montana include; maintaining prey bases, maintaining forest stands currently used for nesting, roosting, and foraging, maintaining potential nest habitat, minimizing disturbances in nesting territories, communal roosts and at feeding sites (Montana Bald Eagle Working Group 1991 *In* Montana Field guide 2008).

Existing Condition

The closest bald eagle nest is on Seeley Lake near the mouth of Deer Creek, approximately 1.5 miles northeast of the project area. This nest is used annually and young are successfully fledged in most years. An eagle nest also occurs on Placid Lake, approximately 3 miles southeast of the project area. Within the project area, there are no large bodies of water or larger drainages that are preferred for foraging, although Hidden Lake and marsh habitat along Beaver Creek in the south central portion of the project area provide marginally suitable foraging habitat. The suitability of eagle habitat may be minimally impacted due to the snowmobile use near lands between the project area and Hidden, Seeley and Placid Lakes and an open road density of over 3 miles/mi^2. Also >50 percent of the project area experienced severe canopy mortality (>50 percent) and severely burned areas include large blocks of forest adjacent to Hidden Lake, as well as forested lands adjacent to potentially suitable foraging habitat along Beaver Creek. As a result, the project area does not currently provide preferred bald eagle foraging or nesting eagle habitat.

Environmental Consequences

Direct and Indirect Effects

Effects Common to Both Alternatives

Because approximately 90 percent of the project area was burned and considering most of the lands around Hidden Lake were severely burned, the project area currently provides marginal, if not unsuitable eagle nesting and roosting habitat. As a result, and considering all live trees and the largest dead trees would be retained, there is no change in the availability of roost trees under either alternative.

Alternative 5 (No Action)

Because there are no activities proposed under this alternative there would be no direct effects to the bald eagle, nor are there anticipated effects to foraging habitat. This alternative would leave all live and dead trees within the project area standing and would not affect eagle roosting habitat.

Alternative 3 (Modified Proposed Action)

Treatments proposed within ¼ mile of potentially suitable foraging and roosting habitat include 86 acres of proposed salvage, 0.1 miles of temporary road construction, approximately 3 miles of road maintenance and 0.9 miles of road storage. Although these treatments have potential to disturb eagles, due to the widespread and severe mortality that characterizes affected portions of the project area and considering 98 percent of these treatment areas experienced mortality in excess of 90 percent, it is unlikely that eagles would be utilizing these areas for roosting or foraging. As a result, the potential for direct impacts in the form of disturbance or possible indirect impacts to roost trees is considered extremely remote.

In addition to proposed treatments, FR 349, which runs through occupied eagle habitat near Placid Lake, would be utilized for haul. Log truck traffic passing by the lake has the potential to disrupt foraging and roosting bald eagles. However this road currently receives similar levels of truck traffic and the level of

activity and disturbance is not expected to change. Best Management Practices such as road repair and culvert replacements would help to reduce short-term impacts associated with sedimentation from road use and there are no adverse water quality impacts anticipated that would reduce fish populations and eagle foraging habitat.

Cumulative Effects

Effects Common to Both Alternatives

Human activities have the potential to disturb perching or roosting eagles (Spahr 1991; Steenhof 1978). Timber harvest on non-federal lands within the analysis area, including harvest since the 2007 fire and future harvest, is expected to occur on 5,200 acres of Plum Creek lands and 1200 acres of MTDNRC land. Future timber harvest on federal lands includes approximately 400 acres approved in the Hidden Lake Fuels EA. Other ongoing and foreseeable activities considered in this cumulative effects analysis include firewood cutting, summer and winter recreation, hunting and hazard tree removal.

Because over 80 percent of MTDNRC and Plum Creek lands proposed for salvage were moderately to severely burned, non-federal salvage does not occur within suitable eagle habitat. As a result and considering the Hidden Lake project area does occur near suitable bald eagle habitat, and that there are no treatments proposed under Alternative 3 near occupied eagle habitat, potential impacts to bald eagle roosting, foraging or nest habitat are unlikely under both alternatives.

Current activities such as firewood collection, dispersed recreation, mushroom collection and noxious weed treatment along road corridors would continue. While these activities may result in a short-term, localized source of disturbance, much of this would be concentrated along open roads and the level of disturbance and potential impacts to the bald eagle are not expected to increase.

Summary of Effects and Determination

Alternative 5

Because there are no activities proposed, implementation of Alternative 5 would have **No Impact** on the bald eagle or its habitat.

Alternative 3

Although haul associated with proposed salvage would increase traffic within suitable bald eagle habitat, use is not expected to increase levels of disturbance within suitable habitat. As a result and considering that there would be no effects to existing nests or roosting or foraging habitat, Alternative 3 would have **No Impact** on the bald eagle or its habitat.

Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

Because suitable bald eagle habitat would be unaffected by proposed activities under Alternative 3, both alternatives are consistent with Forest Plan direction to provide habitat for viable populations of all indigenous wildlife species (USDA-FS 1986 p. II-1), and with National Forest Management Act requirements to provide for a diversity of animal communities (604((g)(3)(B)) also see 36 CFR 219.10(b): and FSM 2670.12.

Significance Factors

The analysis presented above provides information on the life history, population trend, surveys and monitoring and limiting factors for the bald eagle, which is a Regionally Sensitive species for the LNF.

Because there are no impacts to this species anticipated, implementation of Alternative 3 would not result in a reduction in viability or a trend in federal listing for this species.

Black-backed woodpecker

Methodology and Analysis Area

The analysis for the BBW is based on the northern region model developed by Samson (2006a and 2006b), and the BBW northern region overview (USDA-FS 2007b), as well as other research related to this species and its habitat (see reference section). Because almost 90 percent of the project area was burned by the Jocko Lakes fire and considering in western Montana, BBWs appear to be strongly dependent upon one to six year-old burns (Hutto 1995a, Caton 1996, Hitchcox 1996, Hejl and McFadzen 2000, Saab et al. 2004), this analysis will focus primarily on fire-created habitat.

Russell et al. (2007) and Dudley and Saab (2007) have developed habitat suitability models to predict 'high quality' post fire BBW habitat. Russell et al. (2007) describe high quality habitat as composed of the following attributes: large patch size (approximately 200 acres) based on pre-fire vegetation data, moderate to high canopy cover (40-100 percent) based on pre-fire vegetation data, and moderate to high burn severity. These models have not yet been tested in conditions other than those described in Russell et al. (2007). However, since these models represent the most recent and best available data, the basic concepts of 'high quality habitat' – large patch size, pre-fire moderate to high canopy closure, and moderate to high burn severities are used in this analysis. Home range size is based on work by Samson (2006a and 2006b) and Russell et al. (2007) and home range size of suitable and high quality habitat is estimated at approximately 200 acres.

Information from the Northern Region Vegetation Mapping Project (R1-VMP), TSMRS data and thermal imagery fire severity data were used to identify potentially suitable habitat across all ownerships. Although other information used in this analysis includes pre-fire aerial photography, stand exam data, snag recruitment information, surveys (wildlife and standing and downed wood) and photos and field notes collected from project field visits. GIS data related to stand and landscape vegetative structural conditions, past and anticipated future management activity, and forest-wide wildfire information were also used.

While it is recognized that the following limitations apply to these models, because they represent the best available information related to BBW use of post-fire habitat, they are expected to adequately display levels of habitat by alternative, from which effects to the BBW can be assessed. However limitations of the models include the following (USDA-FS 2007b):

- The models used to determine 'high quality habitat' were based on one moderate-severity burn in a ponderosa pine/Douglas-fir forest in Idaho.
- Burn severity indices were on based on normalized burn ratios.
- Cover types other than ponderosa pine/Douglas fir may or may not substitute ecologically for ponderosa pine of Douglas fir. For example, lodgepole pine may provide a shorter foraging window than ponderosa pine or Douglas-fir because it has a thinner bark; it does not support beetle larvae as long due to desiccation, peeling bark, etc.).
- Home range size of high quality habitat was based on a small sample size (n=4) and was based on 6 – 8 years post-fire.

- Pre-fire canopy cover may serve as an index to post-fire snag densities. This is based on the assumption that unburned stands of Douglas fir with a high crown closure could result in high densities of burned snags with relatively small diameters.

- Methods to estimate canopy cover, forest structure, and/or cover types may differ among the studies referenced from those used by the Forest Service to estimate habitat availability.

The project area was selected to assess direct and indirect effects of treatment. This area was selected because it is characteristic of the pre-fire vegetative conditions and management activities, both of which largely determine post-fire habitat conditions and use. Also fire severity within the project area is representative of that found within the Jocko Lakes fire perimeter and this area is large enough to assess impacts of treatments on the home range of this species. This species is largely tied to fire-created habitat and in order to identify and assess availability of habitat and effects of salvage across all ownerships, cumulative effects for this species are assessed across the entire Jocko Lakes fires perimeter (36,337 acres). Also as described previously, this assessment includes a multi-scale analysis that looks at Forest-wide and Region-wide availability of habitat.

Species Status, Preferred Habitat and Historical Condition

Although the BBW is considered secure with a Global Rank of G5, in Montana it is a species of special concern (Montana Field Guide 2008). Black-backed woodpeckers are a resident species of Montana, and observations in the state indicate that this species normally does not move outside of its breeding range in the winter (Montana Field Guide 2008).

The BBW is considered opportunistic and responds to outbreaks of wood-boring beetles (*Cerambycidae* and *Buprestidae*) and bark beetles (mountain pine bark beetles (*Dendroctus* spp) in conifer forests following windfall, disease, or fire (Samson 2006a). In the Northern Region the BBW is known to use three types of forest habitat including 1) post-fire areas 2) areas with extensive bark beetle outbreaks causing widespread tree mortality and 3) landscapes with a natural range of disturbances resulting from fire and insect use (Samson 2006a).

Hutto (1995) stated that it would be difficult to find a forest-bird species more restricted to a single vegetation cover type in the northern Rockies than the BBW is to early post-fire conditions. Other research conducted in Montana (Caton 1996, Hitchcox 1996, Hejl and McFadzen 2000, Powell 2000, Kotliar et al 2002 *In* USDA-FS 2007a) also found the BBW to be restricted primarily to post-fire habitat. Although the BBW is capable of surviving in non-post fire areas (Hoyt and Hannon 2002 *In* Samson 2006a) far from recent burns (Taylor and Schachtell 2002 *In* Samson 2006a), recently burned forests contain a higher density of breeding birds (Murphy and Lehnhausen 1998 *In* Samson 2006a, Hutto 1995b *In* TNC 1999).

Research has shown that use of post-fire habitat is temporary and that beetle foraging woodpeckers like the BBW rapidly colonize stand replacing burns within one to two years after the fire (Saab et al 2007). However the favorable effects of fire are not long-lasting and population levels of both the bark beetle and wood-boring beetle drop within four to eight years after a fire, depending on location (Werner and Post 1985 In Samson 2006a). This decline results in reduced densities within five years post-fire, after which beetle foraging woodpeckers such as the BBW are considered rare (Saab et al. 2007). Based on the above research, use of post-fire habitat by the BBW is expected to be greatest one to five years following a burn, after which use would be expected to return to levels at or close to pre-burn conditions.

The duration of occupancy of post-fire habitats also varies depending on the size, distribution and density of snags, as well as the severity of burn. Saab et al (2007) found BBWs selected nest sites with high snag densities of relatively small diameter trees (>9.2” dbh) and that they were strongly associated with habitat

components resulting from mixed severity or stand replacing burns (Saab et al 2002, 2004 *In* Saab et al. 2007). Saab et al (2002) also used pre-fire crown closure as an as an index to post-fire stand densities of snags and found that stands of Douglas-fir could result in high densities of burned snags with relatively small diameters. She also found that BBWs selected landscapes containing large stands of Douglas-fir with high crown closure. Snag density is also affected by timber harvest and Saab and Dudley (1998) found that this species favored un-logged sites for nesting, since these areas were characterized with higher densities of relatively small, hard snags. These preferred un-logged sites would be expected to have three times as many BBWs as un-logged sites (Samson 2006a). The following are recommendations related to management and salvage in post-fire BBW habitat:

- Retain stands with high prey densities in post-fire areas proposed for salvage logging (Powell et al. 2002 In USDA-2007a).
- In post-fire areas proposed for salvage logging, retain un-logged portions of the project area for 0 to 5 years following fire (Kotliar et al. 2002, Saab et al. 2004, Hutto 2006 In USDA-2007a).
- Apply different salvage treatments across the burn including variation in live tree and snag distributions, sizes, and species left uncut (Kotliar et al. 2002 In USDA-2007a).
- Retain large snags (>20” DBH) in order to lengthen the time a burn is suitable for foraging and nesting and retain clumps of trees versus uniformly distributed trees in order to promote snag longevity (Saab and Dudley (1998).

Even though many studies have shown BBWs to primarily use post fire habitat (Caton 1996, Hitchcox 1996, Hejl and McFadzen 2000, Powell 2000, Kotliar et al 2002 *In* USDA-2007a), some studies have found these woodpeckers in areas without recent fire. For example, both Bonnot (2006 *In* USDA-FS 2007a) and Goggans et al. (1988 *In* USDA-FS 2007a) found BBWs within extensive mountain pine beetle outbreaks that occurred in the absence of fires. Although the detection rate for BBWs in these areas was much lower (Cilimburg et al 2006) and on the LNF, these areas are considered secondary habitat.

Samson 2006 estimated the habitat necessary to maintain the minimum viable population of black-backed woodpeckers in the Northern Region and found that BBW habitat is abundant and well distributed across the Region, as well as on individual forests.

Existing Condition

Forest-wide Habitat

This species selects landscapes that have large scale disturbances resulting from fire and insect and disease. Considering this species would move large distances (Taylor and Schachtell, 2002 *In* Samson 2007a) to these habitats, the existing condition for the BBW is evaluated by looking at the Forest-wide availability of habitat, as well as the site and stand level conditions that occur within the JLFS project area. Landscape level conditions include the acreage on the LNF that have had been burned by wildfire in the last five years, as well as the acreage affected by mountain pine beetle.

As described above, use of post-fire habitat by the BBW is greatest within one to five years following a fire. Table 29 identifies acres burned on the Lolo NF since 2003 and displays forest-wide availability of habitat. Table 30 displays wildfire activity within 30 miles of the project area since 2003, which would provide a high density of nesting birds, from which the BBW would be drawn (Hoyt and Hannon 2002).

Table 29: Acres Burned in Wildfires on the Lolo National Forest

Year	Acres Burned
2007	138,376
2006	282
2005	6,104
2004	0
2003	60,105
Total	194,493

Table 30: Past Wildfires Within 30 Miles of the Project Area[a]

Fire Name	Approximate Acres	Year Burned	Shortest Distance to JLFS Project Area
Railley Mountain	21,500	2007	13.8 Miles
Conger Creek	21,300	2007	21.2 Miles
Blackcat	11,700	2007	21.7 Miles
Mile Marker 124	6,200	2007	23.1 Miles
Jenny Creek	800	2006	15.0 Miles
Mineral-Primm	20,600	2003	13.6 Miles
Cooney Ridge	12,400	2003	24.5 Miles
Boles Meadow	4,400	2003	0.1 Miles
Black Mountain	1,600	2003	29 Miles
Dirty Ike	800	2003	18.5 Miles
Total	101,300		

[a] – Only includes fires over 500 acres (home range) in size

Bark beetle infestations are abundant on the LNF. The 2005 Montana forest insect and disease conditions report (USFS 2006) states that the Lolo reporting area is the most heavily impacted in the state and that the mountain pine beetle killed more than 1.4 million lodgepole pine, ponderosa pine and white barked pine on over 207,000 acres. Subsequent ground truthing in extreme amounts of mountain pine beetle mortality on the Superior RD ranged from 103 to 143 trees per acre. Similarly, although the acreages are not mutually exclusive, Forest-wide insect and disease flights on the LNF showed that during 2005 and 2006, approximately 260,000 acres of dead and dying trees occurred on the Forest. So Forest-wide, there is currently a wide-spread availability of both high quality (post-fire) habitats that would likely contain higher densities of BBWs, as well as low quality habitat, or areas that are unburned but have wide-spread insect and disease related tree mortality.

Based on the Forest-wide availability of habitat and species specific habitat requirements, Samson (2006b) identified the critical habitat thresholds necessary to maintain a minimum viable population of the BBW. Samson (2006b) also estimated that currently the LNF provides over 10 times more habitat than is necessary to maintain a minimum viable population for this species. Based on the acreage burned on the LNF in the last five years (See Table 29), this Forest alone provides over six times as much post-fire habitat, than would be necessary to maintain a minimum viable population (approximately 30,000 acres) of this species. Also, considering that 86 percent of the post-fire habitat on the LNF has never been harvested either prior to or after wildfire, the majority of the post-fire habitat on the Forest would be expected to provide habitat conditions consistent with higher density use. Samson (2006b) also found that no gap between current post-burn or insect-infested (with no burn) areas occurs, that would limit BBWs from interacting Region wide. Finally, information provided in Dixon and Saab (2000) suggests this species is increasing in numbers in the United States.

Project Area Habitat

Although no surveys have been conducted, prior to the Jocko Lakes fire suitable BBW habitat would have been marginal (beetle infested stands). Based on Forest-wide monitoring in similar habitat (Cilimburg et al 2006), BBWs would have been absent or existed in very low numbers. However over 90 percent of the project area was burned by the Jocko Lakes fire, which would have created preferred BBW habitat on much of the acreage affected. Also over 70 percent of the project area was moderately to severely burned and starting in 2008, many of these lands would provide the habitat conditions characteristic of high density BBW habitat (Saab et al 2007), although the amount of use would vary depending on snag density.

Environmental Consequences

Direct and Indirect Effects

Table 31 displays high quality BBW habitat by alternative including total habitat available, habitat affected by salvage and the number of blocks of high quality habitat greater than or equal to 200 acres. Suitable post-fire habitat of closed canopy conifer stands that were moderately to severely burned and are likely to contain numbers of snags consistent with BBW use totals approximately 4750 acres or 64 percent of the project area. Because salvage harvest in potential BBW habitat has been shown to virtually eliminate BBW use (Caton 1996, Hejl and McFadzen 1998, Hitchcox 1996, Saab and Dudley 1998, Hutto 2006, Koivula and Schmiegelow 2007, and McIver and Starr 2000 In USDA-FS 2007a), this analysis assumed that salvaged units would no longer provide high density habitat, even though some fire-killed trees would be retained within salvage units.

Table 31: Alternative Black-backed Woodpecker Habitat

	Alternative 3	Alternative 5
Acres Suitable Habitat Salvaged	1224	0
High Quality Habitat (%)[a]	3523 (48%)	4747 (64%)
Number of Potential Territories[b]	7	10

[a]- % of the project area
[b] – blocks of habitat greater than 200 acres

Effects Common to Both Alternatives

Use of the project area is partially determined by the availability of BBW from areas containing adequate numbers of birds for dispersal into new habitats. As shown in Table 29 and Table 30, almost 200,000 acres of recent (last five years) post-fire habitat currently occur on the LNF, including over 100,000 acres within 30 miles, or the documented dispersal distance (Hoyt and Hannon 2002) from the project area. Additionally, 87 percent of the post-fire habitat on the Forest has not been harvested (since 1980) and much of the existing Forest-wide habitat is considered suitable and occupied. Finally, BBW habitat has greatly increased since the 2007 fire and considering 77 percent of the project area will be left untreated under Alternative 3, suitable and high quality BBW habitat will remain widespread across the project area under both alternatives.

Alternative 5 (No Action)

The Jocko Lakes fire greatly increased available habitat for the BBW and currently approximately 64 percent of the project area would provide high quality habitat under this alternative. Because there are no activities proposed under this alternative there would be no direct effects. Spruce beetle, Douglas-fir beetle, and other wood-boring beetle populations would be expected to increase, creating an adequate prey base across the burned and adjacent landscape. Use would continue for five to six years, after which,

BBW populations would begin to naturally decline following the decline in beetle larvae. Within eight years, it is expected that population levels would return to pre-fire levels.

Alternative 3 (Modified Proposed Action)

Approximately 75 percent of the suitable habitat would be unaffected under this alternative and direct and indirect effects are the same as those described under Alternative 5 on this area.

Although no surveys have been conducted, due to the preferred habitat created it is likely that many of the sites proposed for salvage would be occupied by the BBW, creating risks of disturbance and/or mortality. However with implementation of project design features no sites would be salvaged unless one of the following two conditions exist; 1) the site has been surveyed and is not occupied and/or 2) the site has not been surveyed and any salvage or tree removal would occur outside the BBW breeding season (no harvest between 4/1 and 6/30). So while proposed salvage is expected to result in disturbance on up to 25 percent of the suitable habitat, potential morality to nesting birds and young birds that cannot fly is considered remote. Also any disturbance is expected to be short term (1 season) and due to the widespread availability of un-treated post-fire areas, adjacent suitable habitat is available for disturbed birds to move into.

Proposed treatments that are expected to reduce suitable habitat include road construction and salvage harvest identified in Table 1. Road construction would convert approximately 10 acres to non-forest and there would be a long-term loss of habitat on this acreage.

The effect of timber harvest on this species varies somewhat by the type of harvest (USDA-FS 2007a) and some researches have not documented any nesting within salvaged stands (Hejl and McFadzen, 2000), while others have documented occurrence, but at greatly reduced numbers (Saab an Dudley 1998). However existing research clearly shows that salvage harvest similar to that proposed would adversely affect habitat and reduce number of nesting and/or foraging birds utilizing the site (Hejl and McFadzen 2000, Saab and Dudley 1998, Saab et al 2002, Saab e al 2004). As a result implementation of Alternative 3 is expected to reduce or eliminate suitable BBW habitat on 1062 acres. Also this reduction in suitable habitat would reduce the number of possible high quality territories from nine (no action alternative) to seven.

While this alternative would reduce suitable habitat from that of Alternative 5, the availability of BBW habitat is still greatly increased from what occurred prior to the Jocko Lakes fire and overall, approximately 48 percent of the project area would provide suitable BBW habitat under this alternative. Also because salvage units are widely scattered, suitable and high quality habitat would be widely distributed.

Cumulative Effects

Cumulative Effects Common to Both Alternatives

Activities that have the greatest potential to result in long-term cumulative effects to the BBW and its habitat include activities that reduce standing and dead trees including timber harvest, wildfire and insect and disease related tree mortality, which are summarized in Appendix D. Across the range of this species, the natural pattern of beetle outbreaks has been altered through silvicultural and fire management practices. Silvicultural practices have reduced suitable habitat, by harvesting beetle infested, fire killed and wind killed trees, whereas fire management policies have lengthened natural fire regimes and allowed more frequent occurrence of beetles. Additionally open roads continue to provide access for firewood cutters, decreasing snags potentially used by the BBW as feeding and nesting sites.

The effects of past actions are included in the environmental baseline and are reflected in the current availability of suitable habitat (2008) identified in Table 32. For the purpose of this analysis, suitable habitat (foraging and nesting) includes lands of that contain trees that are five inches or greater in diameter that were moderately to severely burned, whereas nesting habitat, includes those moderately to severely burned sites that are characterized by trees 10 inches or greater in diameter. Table 32 displays suitable (foraging and nesting) post-fire habitat that currently exists within the analysis area (2008), as well as alternative habitat occurring in 2012, following completion of remaining (non-federal) and proposed (federal) salvage.

Table 32: Black-backed Woodpecker - Alternative Cumulative Effects Summary

Ownership	2008 Post-fire Habitat[a, b]		Ongoing/Future Harvest[a, b]		Alternative 3 2012 Habitat[a, b]		Alternative 5 2012 Habitat[a, b]	
	Acres	% of Analysis Area	Alt 3 Acres	Alt 5 Acres	Acres	% of Analysis Area	Acres	% of Analysis Area
NFS	7,200 (5,014)	20 (14)	1224 (1,066)	0	5976 (3,948)	16 (11)	7,200 (5,014)	20 (14)
Non-federal	12,113 (10,275)	33 (28)	6097 (4,826)	6097 (4826)	6016 (5,449)	17 (15)	6016 (5,449)	17 (15)
Total	**19,313 (15,289)**	**53 (42)**	**7321 (5,892)**	**6097 (4826)**	**11,992 (9,397)**	**33 (26)**	**13,216 (10,463)**	**36 (29)**

[a] – numbers shown in parenthesis are suitable nesting habitat
[b] - % of the analysis area

While past harvest has reduced the current distribution and availability of suitable habitat, it is estimated that suitable BBW habitat currently occurs on approximately 53 percent of the analysis area. Of this, approximately 79 percent is considered suitable for nesting. Also existing nest habitat is currently widespread (42 percent of the analysis area) and much of it occurs in blocks greater than 178 acres in size (home range size identified by Samson 2006b).

Alternative 5

Because it is expected that few residual trees would be left following salvage on non-federal lands, all sites harvested would not provide suitable BBW habitat. As a result, anticipated non-federal salvage would reduce habitat (See Table 30), although suitable and nesting habitat would continue to occur on 36 percent and 29 percent of the analysis area respectively. Also with the exception of the large block of Plum Creek lands in the northern portion of the analysis area, both suitable and nesting habitat is well distributed across affected watersheds.

Alternative 3

In addition to anticipated cumulative effects described under Alternative 5, proposed salvage would reduce suitable BBW habitat by another 4 percent and suitable nesting habitat by another 3 percent. By 2012, it is estimated that suitable and nesting BBW habitat would occur on 33 percent and 26 percent of the analysis area under this alternative. Also like alternative 5, remaining habitat would continue to occur within all affected watersheds.

Summary of Effects and Determination

Samson (2006b) estimates that at least 30,000 acres of suitable habitat are necessary to provide adequate habitat to support a minimum viable population of BBW region wide. Although suitable habitat would be reduced under both alternatives, based on information provided in Table 30 (Forest-wide habitat), Table

31 (habitat within 30 miles) and Table 32 (cumulative effects area habitat), habitat provided under both alternatives would greatly exceed the availability of habitat necessary to maintain a minimum population of the BBW across the region. Further adequate habitat on the LNF alone would greatly exceed this minimum population threshold.

Alternative 5

Because there are no activities proposed under this alternative, implementation of Alternative 5 would have **No Impact** on the black-backed woodpecker or its habitat.

Alternative 3

Although proposed activities would reduce suitable habitat for this species and increase the risk of disturbance or mortality, based on the above analysis and the following rationale, implementation of Alternative 3 **May impact individuals or habitat, but would not likely contribute towards a trend in Federal listing or cause a loss of viability.**

- Implementation of project design features (no timber harvest during the BBW breeding season) would reduce potential mortality to black-backed woodpecker.
- The Jocko Lakes fire greatly increased available BBW habitat in the area. Because over 85 percent of the NFS lands within the Jocko Lakes burn perimeter would be unaffected by treatment under Alternative 3, available habitat on NFS lands would be largely unchanged under both alternatives.
- Evidence suggests the black-backed woodpecker is increasing in numbers in the United States (as cited in Dixon and Saab 2000). No demographic information exists to suggest a decline in black-backed woodpecker numbers.
- Black-backed woodpecker habitat is abundant and well distributed across the Northern Region and by Forest. Also distances between areas of suitable habitat are all within 63 miles (dispersal distance).
- Habitat for the black-backed woodpecker has recently increased, and amounts are expected to increase as fires and bark beetle outbreaks continue to increase in size (Gallant et al. 2004, Hessburg and Agee 2003, Hessburg et al. 2005 In Samson 2006b).
- The level of salvage timber harvest of the forested landscape in the Northern Region is insignificant in relation to the needs of this species (Samson 2006a).
- A comparison of habitat required for a minimum viable population to that available indicates well-distributed habitat far exceeds that needed, given the natural distribution of species and their habitats as mapped and according to the scientific literature (Samson 2006b)

Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

Because over 85 percent of the NFS lands within the Jocko Lakes fire perimeter would be left untreated under both alternatives and considering all sites proposed for treatment under Alternative 3 meet or exceed levels of snags and downed woody debris recommended in the Forest Plan (USDA-FS 1986, the Lolo NF Downed Wood Guide (USDA-FS 2006) and the Region 1 Snag Management Protocol, USDA-FS 2000a), both alternatives are consistent with Forest Plan direction to provide habitat for cavity nesting wildlife and species dependent on snags (USDA-FS 1986 p. II-2, USDA-FS III-72, USDA-FS 1986 III-33-34). Also based on the above analysis and the above summary of effects and determination, both alternatives are consistent with Forest Plan direction to provide habitat for viable populations of all

indigenous wildlife species (USDA-FS 1986 p. II-1) and with National Forest Management Act requirements to provide for a diversity of animal communities (16 USC 1604((g)(3)(B)) also see 36 CFR 219.10(b): and FSM 2670.12.

Significance Factors

The analysis presented above provides detailed information on the life history, population trend, surveys and monitoring and limiting factors for the black-backed woodpecker, which is a Regionally Sensitive species for the Lolo NF. Although implementation of Alternative 3 may impact this species, based on the analysis provided, neither alternative would result in a reduction in viability or a trend in federal listing for this species.

Flammulated owl

Methodology and Analysis Area

The effects analysis for the flammulated owl is based largely on the Northern Region habitat model (Samson 2006a and 2006b) and assumes that suitable habitat consists of large diameter stands that are characterized by dry ponderosa pine/Douglas fire habitat groups (1-3) and provide between approximately 40 percent and 75 percent canopy closure and open understories. Also while there is no estimate for the number of snags on these sites, because some level of mortality is expected in all sites, it is assumed that these stands provide dead tree habitat consistent with the model. Information used in this analysis includes life history, distribution and status and trend information provided in Samson (2006a), as well as other research related to this species and its habitat (see reference section), pre-fire aerial photography, stand exam data, Northern Region Vegetation Mapping Project (R1-VMP) data, and field surveys and photos collected from project field visits. Suitable habitat was identified using GIS data related to vegetation information contained in the LNF timber and stand database (TSMRS), both stand and landscape vegetation and structural conditions, past management activity, and thermal imagery data to predict fire related mortality.

The project area was selected to assess direct and indirect effects to this species, because it contains vegetation communities and structural conditions that are characteristic of those found on the landscape and would be expected to accurately represent available habitat conditions affected by treatment. The cumulative effects area includes all lands within the affected watersheds (6^{th} field HUC) and rationale for selection of this area is described under the Process section of this document. Additionally this area was selected because it includes both burned and unburned areas and can be used to assess habitat for owls displaced by the fire.

Species Status, Preferred Habitat and Historical Condition

The flammulated owl has a conservation status rank of G4 (Natureserve 2008) and this species is considered uncommon, but usually widespread. The Montana Partner in Flight (PIF) Plan considers the flammulated owl a Priority 1 species, or a species in which Montana has a clear obligation to implement conservation action (PIF 2000). The flammulated owl is considered a species potentially at risk because of limited and potentially declining numbers, extent and/or habitat, even though it may be abundant in some areas. It has a state rank of S3 (breeding) (Natureserve 2008)

Flammulated owls are seasonal migrants that occupy home ranges in the northern Rocky Mountains during spring, summer, and early fall. They are strongly associated with ponderosa pine forests during breeding and prefer open, single-storied stand structures for foraging Reynolds and Linkhart 1992). The Montana PIF Plan (PIF 2000) considers this species to be associated with dry ponderosa pine and Douglas fir with open understories largely covered with grasses and a few shrubs or small clumps of

regenerating trees. The flammulated owl subsists nearly exclusively on insects, especially moths and beetles, and forages in the tree canopy and on the ground (Samson 2006a). Linkhart et al. (1998 *In* Samson 2006a) reported a mean size territory of between 27 and 45 acres

Holt et al. (1987 *In* Natureserve 2008) reported the first record of the flammulated owl in Montana in 1962 near Glacier Park. The first nest in Montana was documented on July 15, 1986 in Missoula County. By 1998, flammulated owls were considered to have a widespread presence in Missoula and Ravalli counties. In 2005, the R1 Inventory and Monitoring project detected singing male owls on the LNF at 35 (+- 14 percent) of the random points surveyed, suggesting the species is relatively common in the road accessible areas of the Douglas-fir/ponderosa pine zone (http://avianscience.dbs.umt.edu/research_landbird_ flam.htm). These Region 1 surveys indicate that Douglas-fir and larch forests may also support populations of this species.

A study by Wright (1996) in the Bitterroot Valley concluded that this species selects for microhabitat features such as large trees and snags, but only within an appropriate landscape context. Flammulated owls were not present unless the larger landscape consisted of open understory ponderosa pine/Douglas-fir forests, and then only where grassland or xeric shrubland openings were present at a home-range scale. Flammulated owls appear to avoid clear cuts and intensively cutover areas, but they would use thinned or selectively logged stands.

Samson (2006a) characterizes flammulated owl habitat as; single or two storied ponderosa pine or ponderosa/Douglas fir forests with 35-85 percent canopy cover, > 12.2 inch basal area weighted dbh and >2.5 snags/acre >10 inches dbh. Areas that are composed of at least 75 percent old ponderosa pine/Douglas-fir forest type are occupied by flammulated owls more than those areas with less than 75 percent of this forest type (Wisdom et al. 2000).

Using habitat variables reported in the scientific literature to build habitat relationships models, Samson (2006a) estimated flammulated owl breeding habitat available in each National Forest in R1. These models were then used to query the FIA database, resulting in statistically reliable habitat estimates by National Forest. Results indicate that breeding habitat is well distributed region-wide. Although a modest decline in ponderosa pine from 1942 to present has been reported in 9 of 12 National Forests, Douglas-fir has increased in abundance more substantially, suggesting an overall increase in habitat for the owl.

Although dry, ponderosa pine and Douglas fir habitat are naturally limited on the LNF; FIA estimates show flammulated owl habitat comprises 15,923 acres of the LNF which is 3 times the amount needed to maintain a minimum viable population region-wide.

Existing Condition

No surveys have been conducted for this project, and, this species has not been documented within the project area during previous surveys (USDA-FS 2008b). Due to decades of fire suppression and a predominance of more mesic sites, less suitable for drier ponderosa pine, the project area contains very little preferred flammulated owl habitat. Prior to the Jocko Lakes fire, approximately 10 percent of the project area contained potentially suitable flammulated owl habitat (PP/DF habitat with >35 percent overstory and predominately sawtimber stands). Prior to the 2007 fire, suitable habitat occurred as small, widely scattered stands, and the project area did not provide the landscape conditions that this species often selects for. Approximately 60 percent of potentially suitable habitat was moderately to severely burned, which reduced overstory levels below those used in the Northern Region model and currently, only approximately 300 acres of potentially suitable flammulated owl habitat occur within the project area.

Environmental Consequences

Direct and Indirect Effects

Effects Common to Both Alternatives

Prior to the Jocko Lakes fire, approximately 750 acres or 10 percent of the project area provided potentially suitable habitat, although not all of this acreage had canopy closure conditions consistent with flammulated owl use. Approximately 450 acres or 61 percent of the potentially suitable habitat experienced canopy mortality of approximately 75 percent or more and these areas no longer provide suitable flammulated owl habitat. Also it would likely take several decades before many of these stands would again develop large enough trees and adequate crown closure to provide suitable habitat. Although most of the suitable habitat was burned, the project area currently contains 293 acres of suitable flammulated owl habitat. Also because many of these sites contained relatively closed canopy conditions in excess of 75 percent crown closure prior to the fire, the fire-related canopy mortality may have improved some of these areas by creating more open conditions preferred by this species.

As described under Affected Environment, research in Montana (Wright 1996) indicates this species selects stand level habitat only within an appropriate landscape context. Flammulated owls were not present unless the larger landscape consisted of open understory ponderosa pine/Douglas-fir forests or where grassland or xeric shrubland openings were present at the home range scale. Also flammulated owls appear to avoid areas where the overstory was greatly modified. So while approximately 4 percent of the project area provides potentially suitable habitat, it is widely scattered and generally consists of relatively small blocks. As a result and considering that 1) preferred landscape conditions did not exist prior to the fire, and 2) the project area has been greatly opened up and altered due to the Jocko Lakes fire, it is unlikely that suitable habitat within the project area would be utilized either in the short or long term.

Alternative 5 (No Action)

Because there are no activities proposed under this alternative there are no direct effects anticipated. However some indirect effects to preferred habitat are expected to occur. Because ponderosa pine has been reduced due to the 2007 fire, and considering remaining areas are understocked (i.e. no longer contain adequate ponderosa pine seedlings), it is likely that lodgepole pine would become established on many sites that previously contained ponderosa pine. Because this alternative only involves natural regeneration, it is expected that there would be a long-term reduction in ponderosa pine, and potentially suitable flammulated owl habitat in these areas.

Alternative 3 (Modified Proposed Action)

Direct effects under this alternative include disturbance and possible mortality during timber harvest, road construction/maintenance and supplemental planting. Due to the predominance of winter logging and with implementation of project design features that restrict timber harvest during most of the breeding season, potential impacts would be reduced.

Indirect effects include changes to remaining suitable habitat which include 63 acres of salvage harvest. While there would be reduction in live canopy on approximately 30 acres due to clearing of skyline corridors, this would not reduce the canopy to levels below those identified in the model (Samson 2006a). Considering salvage harvest only involves removal of dead trees, all sites would continue to provide adequate canopy closure. Additionally, because the flammulated owl has been found to utilize partially logged areas (Wright 1996), and considering a large diameter snag component (>20 inches dbh) will be maintained (See Table 7- dry site snag retention), all sites would continue to provide potentially suitable

habitat. However, due to the reduction in medium and large diameter snags (14-20 inches dbh), the quality of suitable habitat would be reduced on this acreage.

Objectives of supplemental planting proposed under this alternative include maintaining tree species diversity, particularly ponderosa pine and western larch. As a result, planting implemented under this alternative would help ensure that ponderosa pine is re-established on suitable sites and increase the likelihood that this species will become a part of the post-fire landscape. So while the project area currently contains little preferred flammulated owl habitat, proposed planting would help ensure that this declining (Noss et al. (1995 In IPIF 2000) and important tree species would be maintained.

Cumulative Effects

Effects Common to Both Alternatives

Anticipated cumulative effects are summarized in Appendix D. Historic timber harvest in combination with active fire suppression, have contributed to the lack of habitat that currently exists within the project and cumulative effects analysis area. Also because this species requires large diameter snags, past and on-going firewood harvest have further reduced the suitability of habitat on approximately 10 percent of the area near open roads. Prior to the Jocko Lakes fire, preferred large diameter ponderosa pine and Douglas fire forest occurred on approximately five percent of the analysis area. However over 80 percent of this was moderately to severely burned and most the pre-fire habitat no longer contains adequate crown closure to provide suitable habitat. As a result neither alternative would provide preferred habitat conditions, and use of the area by the flammulated owl is not expected to occur under either alternative.

By 2012, it is estimated that approximately 6400 acres of salvage harvest on non-federal lands would have occurred within the CE analysis area since the Jocko Lakes fire. This includes 1) approximately 5200 acres of ongoing and future harvest on Plum Creek lands, and 2) 1200 acres of ongoing and future harvest on MT DNRC lands. Additionally, approximately 400 acres of partial harvest on NFS lands associated with the Hidden Lake Fuels project would be implemented under both alternatives.

Most of the non-federal salvage will occur in areas that were moderately to severely burned. Also all Hidden Lake harvest involves partial harvest activities, which will maintain a mature forest canopy and suitable flammulated owl habitat conditions on the affected sites. Also considering that the analysis area does not contain the landscape conditions preferred by this species, potential for occupancy is low. Collectively for these reasons, there are no significant cumulative effects anticipated under either alternative.

Summary of Effects and Determination

Alternative 5 (No Action)

Because there are no activities proposed under this alternative, implementation of Alternative 5 would have **No Impact** on the flammulated owl or its habitat.

Alternative 3 (Modified Proposed Action)

While Alternative 3 may result in disturbance or mortality to flammulated owls, with implementation of a project design feature that restricts harvest between 4/1 and 6/30, potential direct impacts would be reduced. Also although structural conditions would be modified on less than 100 acres of suitable habitat, canopy closure would not be reduced to a level that would make habitat unsuitable. Further, all sites proposed for treatment would continue to provide large diameter snags suitable for nesting. So based on the above analysis and the following regional considerations (Samson 2006b), implementation of

Alternative 3, **May impact individuals or habitat, but would not likely contribute towards a trend in Federal listing or cause a loss of viability.**

- No scientific evidence exists that the flammulated owl is decreasing in numbers.
- Increases in the extent and connectivity of forested habitat have occurred since European settlement.
- Well-distributed and abundant flammulated owl habitat exists on today's landscape.
- The level of timber harvest in the Northern Region is insignificant in relation to this species' habitat needs (in 2006, 6,876 ha of 9,045,255 ha or 0.08 percent of the forested landscape) and suitable habitat is well distributed across the Region and Forest.

Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

Over 77 percent of the NFS lands within the Jocko Lakes project area would be left untreated under both alternatives. As a result and considering all sites proposed for treatment under Alternative 3 meet or exceed levels of snags and downed woody debris recommended in the Forest Plan (USDA-FS 1986, the LNF Downed Wood Guide (USDA-FS 2006) and the Region 1 Snag Management Protocol, USDA-FS 2000a), both alternatives are consistent with Forest Plan direction to provide habitat for cavity nesting wildlife and species dependent on snags (USDA-FS 1986 p. II-2, USDA-FS III-72, USDA-FS 1986 III-33-34). Based on the above analysis, summary of effects and determination, both alternatives are consistent with Forest Plan direction to provide habitat for viable populations of all indigenous wildlife species (USDA-FS 1986 p. II-1) and with National Forest Management Act requirements to provide for a diversity of animal communities (16 USC 1604((g)(3)(B)) also see 36 CFR 219.10(b): and FSM 2670.12.

Significance Factors

The analysis presented above provides detailed information on the life history, population trend, surveys and monitoring and limiting factors for the flammulated owl, which is a Regionally Sensitive species for the Lolo NF. Although implementation of Alternative 3 may impact individuals of this species, based on the analysis provided, neither alternative would result in a reduction in viability or a trend in federal listing for this species.

Species Determination Summary

Based on the analysis presented above and in the project BA, Table 33 provides a summary of the viability determinations for all Threatened, Endangered and Sensitive Species on the Lolo NF, as well as habitat and population determinations for Forest Management Indicator Species.

Table 33: TES and MIS Effect Determination Summary

Species	Alternative 3 Determination	Alternative 5 Determination
Threatened and Endangered Species		
Grizzly Bear	May Affect, Not Likely to Adversely Affect	No Effect
Canada Lynx	May Affect, Not Likely to Adversely Affect	No Effect
Northern Rocky Gray Wolf	No Effect	No Effect
Regionally Sensitive Species		
Fisher	May impact individuals or habitat, but would not likely contribute towards a trend in Federal listing or cause a loss of viability.	No Impact
Wolverine	May impact individuals or habitat, but would not likely contribute towards a trend in Federal listing or cause a loss of viability.	No Impact
Northern Bog Lemming	No Impact	No Impact
Townsends Big-eared Bat	No Impact	No Impact
Harlequin Duck	No Impact	No Impact
Black-backed Woodpecker	May impact individuals or habitat, but would not likely contribute towards a trend in Federal listing or cause a loss of viability.	No Impact
Bald Eagle	No Impact	No Impact
Peregrine Falcon	No Impact	No Impact
Flammulated Owl	May impact individuals or habitat, but would not likely contribute towards a trend in Federal listing or cause a loss of viability.	No Impact
Common Loon	No Impact	No Impact
Northern Leopard Frog	No Impact	No Impact
Coeur d'Alene Salamander	No Impact	No Impact
Boreal Toad	May impact individuals or habitat, but would not likely contribute towards a trend in Federal listing or cause a loss of viability.	No Impact
Forest Management Indicator Species		
Pileated Woodpecker	May impact individuals or habitat, but is not expected to cause a local or regional change in habitat quality or population status.	Not Likely to cause a local or regional change in habitat quality or population status.
Elk	May impact individuals or habitat, but is not expected to cause a local or regional change in habitat quality or population status.	Not Likely to cause a local or regional change in habitat quality or population status.
Northern Goshawk	May impact individuals or habitat, but is not expected to cause a local or regional change in habitat quality or population status.	Not Likely to cause a local or regional change in habitat quality or population status.

Wildlife Effect Summary

While there would be some minor shifts in the availability of habitat under both alternatives, based on analysis of direct, indirect and cumulative effects analysis presented above, analysis provided in the BA and the following rationale, the diversity of wildlife and wildlife habitat is not expected to decline under any alternative.

- Over 77 percent of the Jocko Lakes project area and 85 percent of the Jocko Lakes burn perimeter would be unaffected under both alternatives.
- Habitat for Forest MIS species including the Pileated Woodpecker, Northern Goshawk and Elk would continue to be available and there are no effects under any alternative that would contribute to a local or regional change in habitat quality or population status of these species.
- Neither alternative is likely to adversely affect any threatened or endangered species.
- There are no anticipated effects under any alternative that would cause a trend toward federal listing of any Sensitive species or reduce species viability.
- All activities are consistent with goal, objectives, management direction, and standards and guidelines in the Lolo Forest Plan (USDA-FS 1986).

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