Project Management Indicator Species Report, Terrestrial Wildlife

Rim Fire Recovery

Supervisor's Office

Stanislaus National Forest

Prepared By: Ryan S. Kalinowski

Wildlife Biologist
Stanislaus National Forest
08/04/2014

and

Karen S. Harville

Wildlife Biologist
Lassen National Forest
08/04/2014

Table of Contents

Introduction.....2
Selection of Project Level MIS.....4
Bioregional Monitoring Requirements for MIS Selected for Project-Level Analysis 7
Description of Proposed Project 7
Effects of Proposed Project on the Habitat for the Selected Project-Level MIS 10
-Late Seral Closed Canopy Coniferous Forest Habitat (California spotted owl, American marten, and northern flying squirrel).....12
-Snags in Green Forest Ecosystem Component (Hairy woodpecker) 21
-Snags in Burned Forest Ecosystem Component (Black-backed woodpecker) 31

1. Introduction

The purpose of this report is to evaluate and disclose the impacts of the Rim Fire Recovery (hereafter, Rim Recovery) Project on the habitat of the thirteen (13) Management Indicator Species (MIS) identified in the Forest (NF) Land and Resource Management Plan (LRMP) (USDA 1991) as amended by the Sierra Nevada Forests Management Indicator Species Amendment (SNF MIS Amendment) Record of Decision (USDA Forest Service 2007a). This report documents the effects of the proposed action and alternatives on the habitat of selected project-level MIS. Detailed descriptions of the Rim Recovery Project alternatives are found in the Rim Fire Recovery FEIS (Final Environmental Impact Statement) (USDA Forest Service 2014).

MIS are animal species identified in the SNF MIS Amendment Record of Decision (ROD) signed December 14, 2007, which was developed under the 1982 National Forest System Land and Resource Management Planning Rule (1982 Planning Rule) (36 CFR 219). Guidance regarding MIS set forth in the Stanislaus NF LRMP as amended by the 2007 SNF MIS Amendment ROD directs Forest Service resource managers to (1) at project scale, analyze the effects of proposed projects on the habitat of each MIS affected by such projects, and (2) at the bioregional scale, monitor populations and/or habitat trends of MIS, as identified in the Stanislaus NF LRMP as amended.

1.a. Direction Regarding the Analysis of Project-Level Effects on MIS Habitat

Project-level effects on MIS habitat are analyzed and disclosed as part of environmental analysis under the National Environmental Policy Act (NEPA). This involves examining the impacts of the proposed project alternatives on MIS habitat by discussing how direct, indirect, and cumulative effects would change the habitat in the analysis area.

These project-level impacts to habitat are then related to broader scale (bioregional) population and/or habitat trends. The appropriate approach for relating project-level impacts to broader scale trends depends on the type of monitoring identified for MIS in the LRMP as amended by the SNF MIS Amendment ROD. Hence, where the Stanislaus NF LRMP as amended by the

SNF MIS Amendment ROD identifies distribution population monitoring for an MIS, the project-level habitat effects analysis for that MIS is informed by available distribution population monitoring data, which are gathered at the bioregional scale. The bioregional scale monitoring identified in the Stanislaus NF LRMP, as amended, for MIS analyzed for the Rim Recovery Project is summarized in Section 3 of this report.

Adequately analyzing project effects to MIS generally involves the following steps:

- ☐ Identifying which habitat and associated MIS would be either directly or indirectly affected by the project alternatives; these MIS are potentially affected by the project.
- ☐ Summarizing the bioregional-level monitoring identified in the LRMP, as amended, for this subset of MIS.
- ☐ Analyzing project-level effects on MIS habitat for this subset of MIS.
- ☐ Discussing bioregional scale habitat and/or population trends for this subset of MIS.
- ☐ Relating project-level impacts on MIS habitat to habitat and/or population trends at the bioregional scale for this subset of MIS.

These steps are described in detail in the Pacific Southwest Region's draft document "MIS Analysis and Documentation in Project-Level NEPA, R5 Environmental Coordination" (May 25, 2006) (USDA Forest Service 2006a). This Management Indicator Species (MIS) Report documents application of the above steps to select project-level MIS and analyze project effects on MIS habitat for the Rim Recovery Project.

1.b. Direction Regarding Monitoring of MIS Population and Habitat Trends at the Bioregional Scale.

The bioregional scale monitoring strategy for the Stanislaus NF's MIS is found in the Sierra Nevada Forests Management Indicator Species Amendment (SNF MIS Amendment) Record of Decision (ROD) of 2007 (USDA Forest Service 2007a). Bioregional scale habitat monitoring is identified for all twelve of the terrestrial MIS. In addition, bioregional scale population monitoring, in the form of distribution population monitoring, is identified for all of the terrestrial MIS. The current bioregional status and trend of populations and/or habitat for each of the MIS is discussed in the 2010 Sierra Nevada Forests Bioregional Management Indicator Species (SNF Bioregional MIS) Report (USDA Forest Service 2010a).

- **MIS Habitat Status and Trend.**

All habitat monitoring data are collected and/or compiled at the bioregional scale, consistent with the LRMP as amended by the 2007 SNF MIS Amendment ROD (USDA Forest Service 2007a).

Habitats are the vegetation types (for example, early seral coniferous forest) or ecosystem components (for example, snags in green forest) required by an MIS for breeding, cover, and/or feeding. MIS for the Sierra Nevada National Forests represent 10 major habitats and 2 ecosystem components (USDA Forest Service 2007a), as listed in Table 1. These habitats are defined using the California Wildlife Habitat Relationship (CWHR) System (CDFG 2005, CDFW 2008). The CWHR System provides the most widely used habitat relationship models for California's terrestrial vertebrate species (ibid). It is described in detail in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

Habitat status is the current amount of habitat on the Sierra Nevada Forests. Habitat trend is the direction of change in the amount or quality of habitat over time. The methodology for assessing habitat status and trend is described in detail in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

- **MIS Population Status and Trend.**

All population monitoring data are collected and/or compiled at the bioregional scale, consistent with the LRMP as amended by the 2007 SNF MIS Amendment ROD (USDA Forest Service 2007a). The information is presented in detail in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

Population monitoring strategies for MIS of the Stanislaus NF are identified in the 2007 Sierra Nevada Forests Management Indicator Species (SNF MIS) Amendment ROD (USDA Forest Service 2007a). Population status is the current condition of the MIS related to the population monitoring data required in the 2007 SNF MIS Amendment ROD for that MIS. Population trend is the direction of change in that population measure over time.

There are a myriad of approaches for monitoring populations of MIS, from simply detecting presence to detailed tracking of population structure (USDA Forest Service 2001, Appendix E, page E-19). A distribution population monitoring approach is identified for all of the terrestrial MIS in the 2007 SNF MIS Amendment (USDA Forest Service 2007a). Distribution population monitoring consists of collecting presence data for the MIS across a number of sample locations over time. Presence data are collected using a number of direct and indirect methods, such as surveys (population surveys), bird point counts, tracking number of hunter kills, counts of species sign (such as deer pellets), and so forth. The specifics regarding how these presence data are assessed to track changes in distribution over time vary by species and the type of presence data collected, as described in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

2. Selection of Project level MIS

Management Indicator Species (MIS) for the Stanislaus NF are identified in the 2007 Sierra Nevada Forests Management Indicator Species (SNF MIS) Amendment (USDA Forest Service 2007a). The habitats and ecosystem components and associated MIS analyzed for the project were selected from this list of MIS, as indicated in Table 1. In addition to identifying the habitat or ecosystem components (1st column), the CWHR type(s) defining each habitat/ecosystem component (2nd column), and the associated MIS (3rd column), the Table discloses whether or not the habitat of the MIS is potentially affected by the Rim Recovery Project (4th column).

Table 1. Selection of MIS for Project-Level Habitat Analysis for the Rim Recovery Project.

Habitat or Ecosystem Component	CWHR Type(s) defining the habitat or ecosystem component[1]	Sierra Nevada Forests Management Indicator Species *Scientific Name*	Category for Project Analysis [2]
Shrubland (west-slope chaparral types)	montane chaparral (MCP), mixed chaparral (MCH), chamise-redshank chaparral (CRC)	fox sparrow *Passerella iliaca*	2
Oak-associated Hardwood & Hardwood/conifer	montane hardwood (MHW), montane hardwood-conifer (MHC)	mule deer *Odocoileus hemionus*	2
Riparian	montane riparian (MRI), valley foothill riparian (VRI)	yellow warbler *Dendroica petechia*	2
Early Seral Coniferous Forest	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), eastside pine (EPN), tree sizes 1, 2, and 3, all canopy closures	Mountain quail *Oreortyx pictus*	2
Mid Seral Coniferous Forest	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), eastside pine (EPN), tree size 4, all canopy closures	Mountain quail *Oreortyx pictus*	2
Late Seral Open Canopy Coniferous Forest	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), eastside pine (EPN), tree size 5, canopy closures S and P	Sooty (blue) grouse *Dendragapus obscurus*	2
Late Seral Closed Canopy Coniferous Forest	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), tree size 5 (canopy closures M and D), and tree size 6.	California spotted owl *Strix occidentalis occidentalis*	3
		American marten *Martes americana*	
		northern flying squirrel *Glaucomys sabrinus*	
Snags in Green Forest	Medium and large snags in green forest	hairy woodpecker *Picoides villosus*	3
Snags in Burned Forest	Medium and large snags in burned forest (stand-replacing fire)	black-backed woodpecker *Picoides arcticus*	3

[1] All CWHR size classes and canopy closures are included unless otherwise specified; **dbh** = diameter at breast height; **Canopy Closure classifications:** S=Sparse Cover (10-24% canopy closure); P= Open cover (25-39% canopy closure); M= Moderate cover (40-59% canopy closure); D= Dense cover (60-100% canopy closure); **Tree size classes:** 1 (Seedling)(<1" dbh); 2 (Sapling)(1"-5.9" dbh); 3 (Pole)(6"-10.9" dbh); 4 (Small tree)(11"-23.9" dbh); 5 (Medium/Large tree)(≥24" dbh); 6 (Multi-layered Tree) [In PPN and SMC] (Mayer and Laudenslayer 1988).

[2] **Category 1:** MIS whose habitat is not in or adjacent to the project area and would not be affected by the project.
Category 2: MIS whose habitat is in or adjacent to project area, but would not be either directly or indirectly affected by the project.
Category 3: MIS whose habitat would be either directly or indirectly affected by the project.

The following species have habitat in or adjacent to the Rim Recovery Project area but will not be discussed in detail because they would not be directly or indirectly affected by the project (identified as Category 2 in Table 1): fox sparrow, mule deer, yellow warbler, mountain quail, and sooty grouse.

Fox sparrow will not be discussed in detail because the Rim Recovery Project alternatives would not change acres of shrub habitat, ground shrub cover class, or shrub size class (see Section 4 for alternative details). The project alternatives focus on salvage logging dead trees and removing hazard trees. The Rim Fire itself was the primary event responsible for changing acres of shrub habitat.

Mule deer will not be discussed in detail because the Rim Recovery Project alternatives would not change acres of oak-associated hardwood or hardwood/conifer habitat, hardwood canopy cover, or hardwood size class. The project action alternatives have management requirements intended to protect oaks, and in some cases improve oak habitat by removing dead conifers and biomass treating small material. Any increase in oak habitat, however, would not occur immediately and is beyond the timescale and scope of this document.

Yellow Warbler will not be discussed in detail because the Rim Recovery Project alternatives would not change riparian habitat acres, deciduous canopy cover, total canopy cover, or CWHR size class. Rim Recovery Project alternatives would not alter canopy cover because the action alternatives propose removal of dead trees, and dead trees do not notably contribute to canopy cover. Some green trees could be removed if they were roadside hazards, but removal of green hazard trees would be minimal and would not change acres, size class, or canopy closure class of riparian habitat.

Mountain quail will not be discussed in detail because the Rim Recovery project alternatives would not change acres of early or mid seral coniferous forest, CWHR tree size class, or understory shrub canopy cover. Project action alternatives would remove dead trees and roadside hazard trees. The removal of green hazard trees would be minimal and would not change acres, size class, or canopy closure class of green trees, or understory shrub canopy closure.

Sooty grouse will not be discussed in detail because the Rim Recovery project action alternatives would remove dead trees and green hazard trees. The removal of green hazard trees would be

minimal and would not change acres, size class, or canopy closure class of green trees, or understory shrub canopy closure class.

The MIS whose habitat would be either directly or indirectly affected by the Rim Recovery Project, identified as Category 3 in Table 1, are carried forward in this analysis, which will evaluate the direct, indirect, and cumulative effects of the proposed action and alternatives on the habitat of these MIS. The MIS selected for project-level MIS analysis for the Rim Recovery Project are: California spotted owl, American marten, northern flying squirrel, hairy woodpecker, and black-backed woodpecker.

3. Bioregional Monitoring Requirements for MIS Selected for Project-Level Analysis

3.a. MIS Monitoring Requirements.

The Sierra Nevada Forests Management Indicator Species (SNF MIS) Amendment (USDA Forest Service 2007a) identifies bioregional scale habitat and/or population monitoring for the Management Indicator Species for ten National Forests, including the Stanislaus NF. The habitat and/or population monitoring requirements for Stanislaus NF's MIS are described in the 2010 Sierra Nevada Forests Bioregional Management Indicator Species (SNF Bioregional MIS) Report (USDA Forest Service 2010a) and are summarized below for the MIS being analyzed for the Rim Recovery Project. The applicable habitat and/or population monitoring results are also described in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a) and are summarized in Section 5 below for the MIS being analyzed for the Rim Recovery Project.

Habitat monitoring at the bioregional scale is identified for all the habitats and ecosystem components, including the following analyzed for the Rim Recovery Project: late seral closed canopy coniferous forest; snags in green forest; snags in burned forest.

Population monitoring at the bioregional scale for California spotted owl, American marten, northern flying squirrel, hairy woodpecker, and black-backed woodpecker: distribution population monitoring. Distribution population monitoring consists of collecting presence data for the MIS across a number of sample locations over time (also see USDA Forest Service 2001, Appendix E).

3.b. How MIS Monitoring Requirements are Being Met.

Habitat and/or distribution population monitoring for all MIS is conducted at the Sierra Nevada scale. Refer to the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a) for details by habitat and MIS.

4. Description of Proposed Project.

Rim Fire Recovery alternatives and wildlife-related management requirements are described here briefly; refer to the Rim Fire Recovery EIS for in depth discussion on the alternatives.

Alternative 1 (Proposed Action)
The Forest Service proposed action, within the Rim Fire perimeter in the Stanislaus National Forest, includes: salvage of dead trees, removal of hazard trees and dead trees along roads, and fuel reduction for future forest resiliency to fire. Implementation is expected to begin summer 2014 and continue up to 5 years. Dead trees in timber units will be designated for removal based on "no green needles visible from the ground."
Proposed treatments in the project area include:

- Salvage of dead trees and fuel reduction (28,326 acres) including ground based mechanized equipment such as harvesters and rubber tired skidders (24,127 acres) and aerial based helicopter (2,930 acres), skyline treatments (1,253 acres), or ground based/skyline swing treatments (16).
- Removal of hazard trees, salvage of dead trees and fuel reduction along existing forest roads (341 miles or 16,315 acres).
- Road reconstruction (319.9 miles) and road maintenance (216.1 miles) for proper hydrologic function and stream protection.
- New road construction (5.4 miles) to allow for salvage removal and long-term access for future activities.

Management Requirements Specific to Alternative 1:

1. Consider additional snags and downed logs to meet habitat needs in Old Forest Emphasis Areas (OFEA), Spotted Owl Home Range Core Areas (HRCA), and forest carnivore connectivity corridor (FCCC).
2. Consider avoiding new landings and skid trails within Protected Activity Centers (PACs).
3. Consider avoiding road construction within 0.25 miles of nest roost sites.
4. Consider mitigating areas where roadside hazard treatments are within PACs and HRCAs by adding acreage to the PAC and/or HRCA equivalent to the treated acres of the most suitable habitat available.

Alternative 2 (No Action)
Under Alternative 2, current management plans would continue to guide management of the project area. General salvage tree removal would not occur. No hazard tree removal would occur adjacent to Level 2 roads. No new permanent road construction, road maintenance, reconstruction, or temporary road construction would occur.

Alternative 3
Alternative 3 responds to resource concerns and research needs by proposing additional treatments and requirements for wildlife habitat enhancement, soil and watershed protections, reduction in the miles of new road construction, and inclusion of several research projects within and outside of treatment units. Under Alternative 3, the Stanislaus National Forest proposes:

- Salvage of dead trees and fuel reduction (30,399 acres) including ground based mechanized equipment such as harvesters and rubber tired skidders (26,252 acres) and aerial based helicopter (3,035 acres), skyline system treatments (1,096 acres), or ground-based/skyline swing treatments (16).

- Removal of hazard trees, salvage of dead trees and fuel reduction along existing forest roads (314.8 miles or 15,253 acres).
- Road reconstruction (323.6 miles) and road maintenance (200.6 miles) for proper hydrologic function and stream protection.
- New road construction (1 mile) to allow for salvage removal and long-term access for future activities.

Forest Plan Amendment:
The Stanislaus National Forest Land and Resource Management Plan would be amended to manage a four mile wide habitat connectivity corridor for old-forest associated species, particularly forest carnivores. The corridor would lead from Yosemite National Park and the North Mountain roadless area west to the Clavey River.

Management Requirements Specific to Alternative 3:

1. In OFEA, HRCA and FCCC units: (1) Retain all hardwood snags greater than or equal to 12 inches diameter at breast height (dbh); and (2) Retain conifer snags at the rate of 30 square feet basal area per acre on a unit basis (a minimum of the four largest). In OFEA, HRCA, FCCC, and in roadside hazard units within PACs, retain the largest size classes of down woody material at a rate of 15 to 20 tons per acre on a unit basis. In all units, emphasize down woody material retention greater than 100 feet from roadsides.
2. Where roadside hazard treatments are within PACs and HRCAs, add acreage to the PAC and/or HRCA equivalent to the treated acres of the most suitable habitat available.
3. Within suitable post-fire PACs, flag and avoid current and historic nest trees and avoid altering screening vegetation within 500 feet; if hazard abatement is deemed immediately necessary, coordinate with a wildlife biologist and with other disciplines (e.g. recreation) as needed to identify options for the deciding official.
4. Flag and avoid hardwood aggregations and meadows and seeps within units. Aggregations are 1/10 to 1/2 acre groups of sprouting hardwood or of meadow/seep vegetation. Groups or meadows/seeps may be linear along drainages. Reaching in and end lining allowed. Ground-based equipment prohibited. Exceptions should be limited but may be made for operability in consultation with the sale administrator and project biologist.

Alternative 4
Alternative 4 responds to public concerns regarding new road construction and protection of black-backed woodpecker habitat. Proposed activities under Alternative 4 are the same as described under Alternative 3 except: this alternative proposes no new permanent road construction and drops approximately 2,500 acres of salvage logging in highly suitable black-backed woodpecker habitat.

Management Requirements Specific to Alternative 4:
Same as those listed under Alternative 3 above.

Management Requirements Common to All Action Alternatives

1. In all units retain:
   - All large hardwood snags greater than or equal to 12 inches dbh.

- A minimum of 4 snags (in the largest size class available) per acre on a unit basis in mixed conifer forest type.
- A minimum of six snags per acre in red fir forest type.
- The largest size classes of dead and downed logs greater than or equal to 12 inches in diameter at the midpoint at a rate of 10 to 20 tons/acre.

2. Provide for a forest carnivore connectivity corridor for fisher and marten, linking Yosemite National Park and the North Mountain inventoried roadless area west to the Clavey River.
3. Do not salvage harvest within PACs unless a biological evaluation determines that the areas proposed for harvests were rendered unsuitable by the Rim Fire for the purpose they were intended.
4. For any new permanent road construction within PACs, HRCAs, forest carnivore connectivity corridors or winter deer range, designate the route as blocked Level 1 or Level 2 gated year round.

Terrestrial MIS Habitat Acres Before and After Each Proposed Alternative

Table 2. Summary of pre-fire, post-fire, and post-treatment terrestrial MIS habitat acres in Stanislaus National Forest within the Rim Recovery analysis area.

MIS Habitat	Pre-Fire	Post-Fire	Post-Action, Alternative 1	Post-Action, Alternative 2	Post-Action, Alternative 3	Post-Action, Alternative 4
Shrubland (west-slope chaparral types)	27,132	53,189	53,190	53,190	53,190	53,190
Oak-associated Hardwood & Hardwood/conifer	35,494	35,494	35,494	35,494	35,494	35,494
Riparian	6	6	6	6	6	6
Early Seral Coniferous Forest	12,767	7,556	7,556	7,556	7,556	7,556
Mid Seral Coniferous Forest	47,147	30,520	30,520	30,520	30,520	30,520
Late Seral Open Canopy Coniferous Forest	10	1,481	830	830	830	830
Late Seral Closed Canopy Coniferous Forest	17,863	12,574	12,574	12,574	12,574	12,574
Snags in Green Forest	85614	50,857	50,857	50,857	50,857	50,857
Snags in Burned Forest	Few*	27,614	10,153	27,614	10,981	12,354

*Acres of snags in burned forest prior to the Rim Fire could not be calculated. Snag retention from previous fires and the associated projects were based on numbers of snags, not acres of snag patches. However, only low snag densities were retained and many of those snags have likely fallen. Therefore it is reasonable to assume that there were very few acres of burned forest suitable for black-backed woodpeckers prior to the Rim Fire.

5. Effects of Proposed Project on the Habitat for the Selected Project-Level MIS.

The following section documents the analysis for the following 'Category 3' species: California spotted owl, American marten, northern flying squirrel, hairy woodpecker, and black-backed

woodpecker. The analysis of the effects of the Rim Recovery Project on the MIS habitat for the selected project-level MIS is conducted at the project scale. However, the analysis areas in this MIS report are larger than the project footprint to account for MIS habitat within the entire fire perimeter, and to accomplish cumulative effects analyses. The "analysis area" is Stanislaus National Forest land within the Rim Fire perimeter and within a few small hazard tree treatment areas that extend just outside the fire perimeter. The "cumulative analysis area" is all land ownerships within the Rim Fire perimeter and the few small hazard tree treatment areas that extend just outside the fire perimeter.

Detailed information on the MIS is documented in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a), which is hereby incorporated by reference. Cumulative effects at the bioregional scale are tracked via the SNF MIS Bioregional monitoring, and detailed in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

California Wildlife Habitat Relationships (CWHR) vegetation classifications are used in this MIS report. Pre-fire information was derived from the 2005 Stanislaus National Forest vegetation layer. Post-fire information was created after the Rim Fire (see Appendix A for methodology). Burn severity was determined using Basal Area Loss from the Rapid Assessment of Vegetation Condition after Wildfire (RAVG) product created by the USDA Forest Service October 22, 2013. The data was derived from Landsat Thematic Mapper imagery, or alternative satellite imagery, when Landsat was not available. The pre-fire image date was October 29, 2011, and the post-fire image date was October 18, 2013. Though pre-fire information is displayed in this report, post-fire habitat is the existing condition and the basis for analysis.

Snag density and down wood tonnage were estimated using common stand exam data downloaded from the Natural Resources Management Natural Resource Information System (NRM NRIS) Field Sampled Vegetation Database (FSVeg). All data were collected between 2005 and 2013 (prior to the 2013 Rim Fire). A total of 1,183 plots were processed using the Western Sierras variant of the Forest Vegetation Simulator (FVS) (Dixon 2002). Plots are assumed to be representative of the CWHR classes within the Rim Fire perimeter. Post-fire information was achieved by simulating fire with the following basal area mortalities: 0% (representing pre-fire conditions and/or post-fire conditions with no mortality), 10%, 25%, 50%, 75%, 90%, and 100%. Though models are never 100% accurate, the simulation results were the best available information for this report. Snag density and down wood tonnage were averaged for each basal area loss category appropriate for the habitat for each MIS. Zero, 10, and 25% basal area loss were used for late seral closed canopy coniferous forest; 0, 10, 25, and 50% for snags in green forest; 50, 75, 90, and 100% for snags in burned forest (see individual MIS sections for further explanation of habitat parameters used for each MIS).

Some snag retention requirements in the Rim Recovery Project action alternatives require basal area retention, while others require a number of snags per acre. For consistency in this analysis, basal area retention was converted to a number of snags per acre by dividing the basal area retention requirement by the average basal area per snag for each MIS habitat.

Late Seral Closed Canopy Coniferous Forest Habitat (California spotted owl, American marten, and northern flying squirrel)

Habitat/Species Relationship.
California spotted owl. The California spotted owl was selected as an MIS for late seral closed canopy coniferous forest (ponderosa pine, Sierran mixed conifer, white fir, and red fir) habitat in the Sierra Nevada. This habitat is comprised primarily of medium/large trees (equal to or greater than 24 inches dbh) with canopy closures above 40% within ponderosa pine, Sierran mixed conifer, white fir, and red fir coniferous forests, and multi-layered trees within ponderosa pine and Sierran mixed conifer forests. The California spotted owl is strongly associated with forests that have a complex multi-layered structure, large-diameter trees, and high canopy closure (CDFG 2005, USFWS 2006). It uses dense, multi-layered canopy cover for roost seclusion; roost selection appears to be related closely to thermoregulatory needs, and the species appears to be intolerant of high temperatures (CDFG 2005). Mature, multi-layered forest stands are required for breeding (Ibid). The mixed-conifer forest type is the predominant type used by spotted owls in the Sierra Nevada: about 80% of known sites are found in mixed-conifer forest, with 10% in red fir forest (USDA Forest Service 2001).

American Marten. The American marten was selected as an MIS for late seral closed canopy coniferous forest (ponderosa pine, Sierran mixed conifer, white fir, and red fir) habitat in the Sierra Nevada. This habitat is comprised primarily of medium/large trees (equal to or greater than 24 inches dbh) with canopy closures above 40% within ponderosa pine, Sierran mixed conifer, white fir, and red fir coniferous forests, and multi-layered trees within ponderosa pine and Sierran mixed conifer forests. Martens prefer coniferous forest habitat with large diameter trees and snags, large down logs, moderate-to-high canopy closure, and an interspersion of riparian areas and meadows. Important habitat attributes are: vegetative diversity, with predominately mature forest; snags; dispersal cover; and large woody debris (Allen 1982). Key components for westside and eastside marten habitat can be found in the Sierra Nevada Forest Plan Amendment FEIS (USDA Forest Service 2001), Volume 3, Chapter 3, part 4.4, pages 20-21.

Northern flying squirrel. The northern flying squirrel was selected as an MIS for late seral closed canopy coniferous forest (ponderosa pine, Sierran mixed conifer, white fir, and red fir) habitat in the Sierra Nevada. This habitat is comprised primarily of medium/large trees (equal to or greater than 24 inches dbh) with canopy closures above 40% within ponderosa pine, Sierran mixed conifer, white fir, and red fir coniferous forests, and multi-layered trees within ponderosa pine and Sierran mixed conifer forests. The northern flying squirrel occurs primarily in mature, dense conifer habitats intermixed with various riparian habitats, using cavities in mature trees, snags, or logs for cover (CDFG 2005).

Project-level Effects Analysis – Late Seral Closed Canopy Coniferous Forest Habitat.

> **Habitat Factor(s) for the Analysis:** (1) Acres of late seral closed canopy coniferous forest (ponderosa pine, Sierran mixed conifer, white fir, and red fir) habitat [CWHR ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), tree

size 5 (canopy closures M and D), and tree size 6]. (2) Acres with changes in canopy closure (D to M). (3) Acres with changes in large down logs (greater than 12 inches in diameter at midpoint; USDA 2001) per acre or large snags (greater than 24 inches) per acre. Twenty-four inches dbh was used to separate medium from large trees rather than 30 inches dbh because common stand exam data available for this project was separated at 24 inches dbh.

Current Condition of the Habitat Factor(s) in the Project Area: Prior to the Rim Fire, there were 17,863 acres of late seral closed canopy coniferous habitat in Stanislaus National Forest within the Rim Recovery analysis area. The Rim Fire reduced late seral closed canopy coniferous habitat by 5,288 acres resulting in a total of 12,574 acres post-fire (Table 4). Within the Rim Recovery cumulative analysis area, there were 46,636 acres of late seral closed canopy coniferous habitat before the Rim Fire and there are 31,008 acres post-fire.

Data Used for the Effects Analysis: The following tables will be used in the discussions of effects of Alternatives 1-4 on late seral closed canopy coniferous habitat:

Table 3. Post-fire late seral closed canopy coniferous habitat proposed for treatment in Stanislaus National Forest within the Rim Recovery analysis area.

	Salvage		Hazard Tree		Total Treatment
	Acres	% of Treatment	Acres	% of Treatment	Acres
Alternative 1	1,310	42	1,821	58	3,131
Alternative 2	0	0	0	0	0
Alternative 3	1,326	43	1,776	57	3,102
Alternative 4	1,231	41	1,783	59	3,014

Table 4. Summary of late seral closed canopy coniferous acres in Stanislaus National Forest within the Rim Recovery analysis area.

CWHR	Pre-Fire	Post-Fire	Post-Treatment (Alternative 1-4)
PPN 5 D	1,106	634	634
PPN 5 M	3	0	0
RFR 5 D	21	21	21
RFR 5 M	0	0	0
SMC 5 D	15,955	11,275	11,275
SMC 5 M	166	127	127
WFR 5 D	594	505	505
WFR 5 M	18	13	13
Total	**17,863**	**12,574**	**12,574**
		Change From Pre-Fire: -5,288	**Change From Post-Fire: 0**

Table 5. Estimates of pre-fire, post-fire, and post-treatment snags per acre in late seral closed canopy coniferous habitat within the Rim Recovery analysis area (Stanislaus National Forest only).

Snag Size	Pre-Fire	Post-Fire	Alt. 1 Post-Action	Alt. 2 (No Action)	Alt. 3 Post-Action	Alt. 4 Post-Action
Snags/ac. 15-24" dbh	10	14	0	14	0	0
Snags/ac. >24" dbh	4	7	4	7	6	6

Post-action estimates were derived from acres within salvage units only. We assumed no snags would remain in hazard tree areas, so estimates of snags per acre would be lower if hazard tree areas were included. In salvage units, we assumed that only the number of snags given in the management requirements for mixed conifer would remain post action (red fir only represented 4% of all the CWHR types in late seral closed canopy coniferous habitat so we used the snag retention requirements for mixed conifer to obtain estimates). Analysis of common stand exam data (1,183 plots prior to the Rim Fire, between 2005 and 2013, within the Rim Recovery analysis area) showed that there are more snags with greater than 24 inches dbh than what would be required for retention in all action alternatives. Therefore we assumed trees with greater than 24 inches dbh would be selected to meet snag retention requirements (see management requirements in Section 4) and no snags less than 24 inches dbh would remain within salvage units or hazard tree areas.

Table 6. Acres of salvage and hazard tree removal in late seral closed canopy coniferous (LSCCC) habitat within the Rim Recovery cumulative analysis area.

	Post-Fire LSCCC Acres in Rim Recovery Cumulative Analysis Area	LSCCC Acres Proposed for Salvage or Hazard Tree Removal in Rim Recovery Project	LSCCC Acres in All Other Salvage or Hazard Tree Projects*	Total LSCCC Acres Salvaged or in Hazard Tree Projects	% LSCCC Acres Salvaged or in Hazard Tree Projects
Alternative 1	31,008	3,131	1,653	4,784	15
Alternative 2	31,008	0	1,653	1,653	5
Alternative 3	31,008	3,102	1,653	4,755	15
Alternative 4	31,008	3,014	1,653	4,667	15

*288 acres of LSCCC habitat in Yosemite National Park hazard tree areas.

*433 acres of LSCCC habitat in private land.

*932 acres of LSCCC habitat in the Rim Hazard Trees project.

For the cumulative salvage and hazard tree analysis, we assumed no acres would be salvaged in Yosemite National Park except for 817 acres of hazard tree removal (288 acres within late seral closed canopy coniferous habitat), and all acres would be salvaged in private land (see Rim Fire Recovery FEIS (USDA Forest Service 2014) for full list of projects). Burned Area Emergency Response (BAER) treatments were considered but did not count towards acres of habitat affected because only immediate hazards were felled and there was no way to accurately calculate acres affected.

Alternative 1 (Proposed Action)

Direct and Indirect Effects to Habitat. In Alternative 1 of the Rim Recovery Project, the primary effect to late seral closed canopy coniferous habitat would be the removal of snags in hazard tree areas and salvage units. Alternative 1 would affect the most acres of late seral closed canopy coniferous habitat of all the alternatives in this report. Within late seral closed canopy coniferous habitat, Alternative 1 proposes approximately 1,310 acres of salvage harvest (42% of total treatment) and 1,821 acres of hazard tree treatment (58% of total treatment; Table 3). Total treatment would be 3,131 acres out of the 12,574 acres (25%) of late seral closed canopy coniferous habitat in Stanislaus National Forest within the Rim Recovery analysis area (Tables 3 and 4).

In treatment areas, acres of habitat and canopy cover would not change. Alternative 1 only proposes the removal of dead trees in salvage units, and only hazardous green or dead trees would be removed in hazard tree areas. Late seral closed canopy coniferous habitat is largely a green tree habitat type, as opposed to a burned forest type, so the treatments described above would not change acres of habitat. The Rim Fire itself was the primary event responsible for reducing acres of late seral closed canopy coniferous habitat. However, the number of snags per acre would be reduced by Alternative 1.

In salvage units, we assume that only 4 snags per acre would remain post-action because that is the retention level specified for mixed conifer in the management requirements. We also assume trees with greater than 24 inches dbh would be selected to meet snag retention requirements and no snags less than 24 inches dbh would remain within salvage units or hazard tree areas (see Table 5 for rationale). Medium sized snags would be reduced from approximately 14 per acre to 0 per acre. Large snags would be reduced from approximately 7 per acre to 4 per acre (Table 5). For this analysis we assume no snags per acre would remain in hazard tree areas, although some snags would likely not be hazardous and could be left standing. If some snags remained standing, they could potentially provide additional snags per acre to the numbers presented in this report.

Common stand exam data show large down logs are generally deficient in late seral closed canopy coniferous forest. Management requirements in Alternative 1 would require retention of 10 to 20 tons of large down wood per acre, so large down wood would not be reduced by the action.

There would be no acres of new road construction within late seral closed canopy coniferous habitat outside of salvage units and hazard tree removal areas; all other new road construction would be within salvage units or hazard tree removal areas so would not count towards additional acres of affected habitat.

Cumulative Effects to Habitat in the Analysis Area. The primary recent impact to late seral closed canopy coniferous habitat was the Rim Fire (as opposed to the Rim Recovery Project and other present and foreseeable actions). The Rim Fire reduced this habitat from 46,636 acres to 31,008 acres. This loss of habitat from fire is considered in this

cumulative effects analysis, but the existing post-fire condition is the baseline for analysis.

Salvage and hazard tree projects within late seral closed canopy coniferous habitat that would be additional to the Rim Recovery Project include: the Forest Service's Rim Fire Hazard Trees (932 acres affected), Yosemite National Park hazard trees (288 acres affected), and private land salvage/hazard trees (433 acres affected). Total acres affected by salvage and hazard tree projects including the Rim Recovery Project would be 4,784 (15%; Table 6).

For this analysis we assume no snags per acre would remain in the areas described above, although in hazard tree areas, some snags would likely not be hazardous and could be left standing. We also assume all snags in private land would be removed, although non-timber industry owned private land would likely leave some snags standing. Therefore, 4,784 acres (15%) is a high estimate of late seral closed canopy coniferous habitat affected by salvage and hazard tree removal. There would be 26,224 acres (85%) of late seral closed canopy coniferous outside of salvage and hazard tree areas.

In addition to salvage and hazard tree actions, there are 1,538 other acres of present and foreseeable actions within late seral closed canopy coniferous habitat in the cumulative analysis area. Green thinning projects account for 1,483 of those acres. Green thinning would not change acres of late seral closed canopy coniferous habitat because the focus of those projects would be to thin the forest without converting vegetation type, size, or canopy cover. Snag removal would be minimal and would generally only occur for safety concerns. Down wood removal would generally be minimal and management requirements for large down wood retention would be in effect. There are 55 acres of restoration activities within late seral closed canopy coniferous habitat that would not change snag density, down wood, or vegetation type, size, or canopy cover. For a full list of the projects described above and justification regarding the consideration of past projects, see Rim Fire Recovery FEIS (USDA Forest Service 2014).

In total, 24,686 acres (80%) of late seral closed canopy coniferous habitat would be outside of all salvage, hazard tree removal, and other present and foreseeable actions.

> **Cumulative Effects Conclusion:** Under Alternative 1, acres of late seral closed canopy coniferous habitat would not change from the existing post-fire condition. Some reduction in snags would occur, but the snag retention requirements would ensure that Alternative 1 would not alter the existing trend in the habitat, even after considering all other present and foreseeable actions.

Alternative 2 (No Action)

Direct and Indirect Effects to Habitat. There would be no removal of trees, road construction, or any other activities associated with the Rim Recovery Project under the no action alternative. Potential negative effects of no action would be high fuel loads and risk of future high severity fire adjacent to remaining habitat or within regenerating

habitat. Positive effects would include the total retention of snags, which are important habitat features, within remaining late seral closed canopy coniferous habitat.

Cumulative Effects to Habitat in the Analysis Area. Under Alternative 2, no removal of trees, road construction, or any other project activities would occur as part of the Rim Recovery Project. We assume all of the other projects described in Alternative 1 cumulative effects would still occur. This would result in 1,653 acres (5%) of late seral closed canopy coniferous habitat affected by other salvage and hazard tree projects (Table 6), and 1,538 acres (5%) in other present or foreseeable actions; there would be 27,817 acres (90%) of late seral closed canopy coniferous habitat outside of all present and foreseeable projects.

If no snags were removed, the accumulation of surface fuels could increase the risk of high severity fire in remaining or regenerating habitat (Rim Fire Recovery FEIS, chapter 3, fire and fuels section 3.05 (USDA Forest Service 2014)). The green thinning projects described under Alternative 1 cumulative effects could possibly mitigate a small amount of the risk if implemented.

The total retention of snags and down wood under Alternative 2 would ensure the existence of numerous snags and abundant down wood across the landscape. This would benefit late seral closed canopy coniferous habitat.

> **Cumulative Effects Conclusion:** Late seral closed canopy coniferous forest would not change from the existing post-fire condition under Alternative 2. Even after considering all other present and foreseeable actions, Alternative 2 would not alter the existing trend in the habitat.

Alternative 3

Direct and Indirect Effects to Habitat. Snag removal in hazard tree areas and salvage units would be the primary effect to late seral closed canopy coniferous habitat in Alternative 3 of the Rim Recovery Project. Alternative 3 would affect less total acres than Alternative 1, but more acres than the other alternatives in this report. Within late seral closed canopy coniferous habitat, Alternative 3 proposes approximately 1,326 acres of salvage harvest (43% of total treatment) and 1,776 acres of hazard tree treatment (57% of total treatment; Table 3). Total treatment would be 3,102 acres out of the 12,574 acres (25%) of late seral closed canopy coniferous habitat in Stanislaus National Forest within the Rim Recovery analysis area (Tables 3 and 4).

As described in the effects analysis for Alternative 1, the acres of habitat and canopy cover would not change. Alternatives 1 and 3 only propose the removal of dead trees in salvage units, and only hazardous green or dead trees would be removed in hazard tree areas. The number of snags per acre would be reduced in Alternatives 1 and 3, but Alternative 3 has additional snag retention requirements:

4 snags per acre would remain post-action in general forest; 30 square feet of snag basal area in Old Forest Emphasis Area, Home Range Core Area, Forest Carnivore Connectivity Corridor, and high salvage study units of the USDA Forest Service Pacific Southwest Research Station (PSW); and 120 square feet of snag basal area in PSW's low salvage study units. For this analysis, we assume only the snag retention amounts described above would remain post-action. Of late seral closed canopy coniferous habitat within salvage units, 33% is in general forest, 60% is in the 30 square foot basal area category, and 7% is in the 120 square foot basal area category. For consistency in this report, snag basal area was converted to snags per acre using the methods described in Section 5 of this document. Results show that in salvage units under Alternative 3, medium sized snags would be reduced from approximately 14 per acre to 0 per acre. Large snags would be reduced from approximately 7 per acre to 6 per acre (Table 5). For this analysis we assume no snags per acre would remain in hazard tree areas, although some snags would likely not be hazardous and could be left standing. If some snags remained standing, they could potentially provide additional snags per acre to the numbers presented in this report.

Common stand exam data show large down logs are generally deficient in late seral closed canopy coniferous forest. Management requirements in Alternative 3 would require retention of 10 to 20 tons of large down wood per acre in general forest and 15 to 20 tons of large down wood in Old Forest Emphasis Area, Home Range Core Area, Forest Carnivore Connectivity Corridor, and hazard tree areas within Protected Activity Centers, so large down wood would not be reduced by the action.

There would be no acres of new road construction within late seral closed canopy coniferous habitat outside of salvage units and hazard tree removal areas; all other new road construction would be within salvage units or hazard tree removal areas so would not count towards additional acres of affected habitat.

Cumulative Effects to Habitat in the Analysis Area. We assume all of the present and foreseeable actions described in Alternative 1 cumulative effects would occur. Total acres affected by salvage and hazard tree projects including the Rim Recovery Project under Alternative 3 would be 4,755 (15%; Table 6). Acres within other present and foreseeable actions would be 1,538 (5%); there would be 24,715 acres (80%) of late seral closed canopy coniferous habitat outside of all present and foreseeable projects.

> **Cumulative Effects Conclusion:** Acres of late seral closed canopy coniferous habitat would not change from the existing post-fire condition under Alternative 3. Some reduction in snags would occur, but the snag retention requirements would ensure that Alternative 3 would not alter the existing trend in the habitat, even when considering all other present and foreseeable actions.

<u>Alternative 4</u>

Direct and Indirect Effects to Habitat. In Alternative 4 of the Rim Recovery Project, the primary effect to late seral closed canopy coniferous habitat would be the removal of

snags in hazard tree areas and salvage units. Alternative 4 would retain the most acres of late seral closed canopy coniferous habitat of all action alternatives in this report. Within late seral closed canopy coniferous habitat, Alternative 4 proposes approximately 1,231 acres of salvage harvest (41% of total treatment) and 1,783 acres of hazard tree treatment (59% of total treatment; Table 3). Total treatment would be 3,014 acres out of the 12,574 acres (24%) of late seral closed canopy coniferous habitat in Stanislaus National Forest within the Rim Recovery analysis area (Tables 3 and 4).

As described in the effects analyses for Alternatives 1 and 3, the acres of habitat and canopy cover would not change under Alternative 4. Alternatives 1, 3, and 4 only propose the removal of dead trees in salvage units, and only hazardous green or dead trees would be removed in hazard tree areas.

Alternative 4 requires the same snag retention per acre as Alternative 3, but would have a different number of acres in each land allocation/retention category. Of late seral closed canopy coniferous habitat within Alternative 4 salvage units, 31% is in general forest, 61% is in the 30 square foot basal area category, and 8% is in the 120 square foot basal area category. In salvage units under Alternative 4, medium sized snags would be reduced from approximately 14 per acre to 0 per acre. Large snags would be reduced from approximately 7 per acre to 6 per acre (Table 5). For this analysis we assume no snags per acre would remain in hazard tree areas, although some snags would likely not be hazardous and could be left standing. If some snags remained standing, they could potentially provide additional snags per acre to the numbers presented in this report.

Management requirements pertaining to large down wood in Alternative 4 are the same as Alternatives 3, so as stated in Alternative 3, large down wood would not be reduced.

There would be no acres of new road construction within late seral closed canopy coniferous habitat outside of salvage units and hazard tree removal areas; all other new road construction would be within salvage units or hazard tree removal areas so would not count towards additional acres of affected habitat.

Cumulative Effects to Habitat in the Analysis Area. We assume all of the present and foreseeable actions described in Alternative 1 cumulative effects would occur. Total acres affected by salvage and hazard tree projects including the Rim Recovery Project under Alternative 4 would be 4,667 (15%; Table 6). Acres within other present and foreseeable actions would be 1,538 (5%); there would be 24,803 acres (80%) of late seral closed canopy coniferous habitat outside of all present and foreseeable projects.

> **Cumulative Effects Conclusion:** Under Alternative 4, acres of late seral closed canopy coniferous habitat would not change from the existing post-fire condition. Some reduction in snags would occur, but the snag retention requirements would ensure that Alternative 4 would not alter the existing trend in the habitat, even when considering all other present and foreseeable actions.

Summary of Status and Trend at the Bioregional Scale

California spotted owl, American marten, and Northern flying squirrel. The Stanislaus NF LRMP (as amended by the SNF MIS Amendment) requires bioregional-scale habitat and distribution population monitoring for the California spotted owl, American marten, and northern flying squirrel; hence, the late seral closed canopy coniferous forest (ponderosa pine, Sierran mixed conifer, white fir, and red fir) habitat effects analysis for the Rim Recovery Project must be informed by both habitat and distribution population monitoring data. The sections below summarize the habitat and distribution population status and trend data. This information is drawn from the detailed information on habitat and population trends in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a), which is hereby incorporated by reference.

Habitat Status and Trend. There are currently 1,006,923 acres of late seral closed canopy coniferous forest (ponderosa pine, Sierran mixed conifer, white fir, and red fir) habitat on National Forest System lands in the Sierra Nevada. Over the last two decades, the trend is slightly increasing (changing from 7% to 9% of the acres on National Forest System lands); since the early 2000s, the trend has been stable at 9%.

Population Status and Trend - California spotted owl. California spotted owl has been monitored in California and throughout the Sierra Nevada through general surveys, monitoring of nests and territorial birds, and demography studies (Verner et al. 1992; Gutierrez et al. 2008, 2009, 2010; USDA Forest Service 2001, 2004, 2006b; USFWS 2006; Sierra Nevada Research Center 2007, 2008, 2009, 2010). Current data at the rangewide, California, and Sierra Nevada scales indicate that, although there may be localized declines in population trend [e.g., localized decreases in "lambda" (estimated annual rate of population change)], the distribution of California spotted owl populations in the Sierra Nevada is stable.

Population Status and Trend – American marten. American marten has been monitored throughout the Sierra Nevada as part of general surveys and studies since 1996 (e.g., Zielinski et al. 2005, Moriarty 2009). Since 2002, the American marten has been monitored on the Sierra Nevada forests as part of the Sierra Nevada Forest Plan Amendment (SNFPA) monitoring plan (USDA Forest Service 2005, 2006b, 2007b, 2009, 2010b). Current data at the rangewide, California, and Sierra Nevada scales indicate that, although marten appear to be distributed throughout their historic range, their distribution has become fragmented in the southern Cascades and northern Sierra Nevada, particularly in Plumas County. The distribution appears to be continuous across high-elevation forests from Placer County south through the southern end of the Sierra Nevada, although detection rates have decreased in at least some localized areas (e.g., Sagehen Basin area of Nevada County).

Population Status and Trend – northern flying squirrel. The northern flying squirrel has been monitored in the Sierra Nevada at various sample locations by live-trapping, ear-tagging, camera surveys, snap-trapping, and radio telemetry: 2002-present on the Plumas and Lassen National Forests (Sierra Nevada Research Center 2007, 2008, 2009, 2010), and 1958-2004 throughout the Sierra Nevada in various monitoring efforts and

studies (see USDA Forest Service 2008, Table NOFLS-IV-1). These data indicate that northern flying squirrels continue to be present at these sample sites, and current data at the rangewide, California, and Sierra Nevada scales indicate that the distribution of northern flying squirrel populations in the Sierra Nevada is stable.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Trends.

California spotted owl. Acres of late seral closed canopy coniferous forest would not change under any alternative of the Rim Recovery Project. Some snag reduction would occur, but the management requirements for snag retention would minimize impacts. The reduction in snags on up to 3,131 acres out of the 12,574 acres of habitat within the analysis area would not alter the existing trend in late seral closed canopy coniferous habitat, nor would it lead to a change in the distribution of California spotted owl across the Sierra Nevada bioregion.

American marten. Acres of late seral closed canopy coniferous forest would not change under any alternative of the Rim Recovery Project. Some snag reduction would occur, but the snag retention requirements would minimize impacts. The reduction in snags on up to 3,131 acres out of the 12,574 acres of habitat within the analysis area would not alter the existing trend in late seral closed canopy coniferous habitat, nor would it lead to a change in the distribution of American marten across the Sierra Nevada bioregion.

Northern flying squirrel. Acres of late seral closed canopy coniferous forest would not change under any alternative of the Rim Recovery Project. Some snag reduction would occur, but the snag retention requirements would minimize impacts. The reduction in snags on up to 3,131 acres out of the 12,574 acres of habitat within the analysis area would not alter the existing trend in late seral closed canopy coniferous habitat, nor would it lead to a change in the distribution of Northern flying squirrel across the Sierra Nevada bioregion.

Snags in Green Forest Ecosystem Component (hairy woodpecker)

Habitat/Species Relationship.
The hairy woodpecker was selected as the MIS for the ecosystem component of snags in green forests. Medium (diameter breast height between 15 to 30 inches) and large (diameter breast height greater than 30 inches) snags are most important. The hairy woodpecker uses stands of large, mature trees and snags of sparse to intermediate density; cover is also provided by tree cavities (CDFG 2005). Mature timber and dead snags or trees of moderate to large size are apparently more important than tree species (Siegel and DeSante 1999). Within the project area, stands that produce these sizes of snags include CWHR: 4S, 4P, 4M, 4D, 5S, 5P, 5M, 5D, and 6.

Project-level Effects Analysis – Snags in Green Forest Ecosystem Component

Parameters Used to Identify Snags in Green Forest Ecosystem Component for the Analysis:

- CWHR types: aspen (ASP), blue oak-digger pine (BOP), blue oak woodland (BOW), Douglas-fir (DFR), Jeffrey pine (JPN), lodgepole pine (LPN), montane hardwood conifer (MHC), montane hardwood (MHW), ponderosa pine (PPN), red fir (RFR), subalpine conifer (SCN), Sierran mixed conifer (SMC), white fir (WFR).
- CWHR sizes 4 and 5.
- CWHR canopy closures S, P, M, and D.
- Basal area loss less than or equal to 50%.

Habitat criteria were determined from the forest habitats listed for hairy woodpecker in CWHR (CDFG 2008). Forest with greater than 50% basal area loss was not identified as green forest because visual inspection of post-fire imagery (pan-sharpened Worldview 8bit, 9/28/13) and field checks indicated that these areas exhibited more burned forest characteristics. Burned forest is covered in this document in the section "**Snags in Burned Forest Ecosystem Component (Black-backed woodpecker).**" We recognize that forest with approximately 50% basal area loss may be a transition habitat, but chose the parameters listed above using best available information.

Habitat Factor(s) for the Analysis: (1) Medium (15-24 inches dbh) snags per acre. (2) large (greater than 24 inches dbh) snags per acre. Twenty-four inches dbh was used to separate medium from large trees rather than 30 inches dbh because common stand exam data available for this project was separated at 24 inches dbh.

Current Condition of the Habitat Factor(s) in the Project Area: Prior to the Rim Fire, there were 85,615 acres of green forest (hairy woodpecker habitat) that could produce medium to large snags, in the Stanislaus National Forest, in the Rim Recovery Project analysis area. Within the analysis area, the Rim Fire reduced this type of green forest by 34,757 acres resulting in a total of 50,858 acres of green forest with medium to large snags, post-fire. Table 7 below describes the existing CWHR habitat types in the analysis area.

Table 7. Summary of snags in green forest (hairy woodpecker habitat) habitat acres pre and post-fire in Stanislaus National Forest within the Rim Recovery analysis area.

CWHR			Pre-Fire	Post-Fire
BOP	4,5	S,P,M,D	764	437
BOW	4,5	S,P,M,D	53	38
JPN	4,5	S,P,M,D	286	229
LPN	4,5	S,P,M,D	402	105
MHC	4,5	S,P,M,D	10382	5,408
MHW	4,5	S,P,M,D	8708	3,598
PPN	4,5	S,P,M,D	13119	7,264
RFR	4,5	S,P,M,D	60	58
SMC	4,5	S,P,M,D	50951	32,936
WFR	4,5	S,P,M,D	891	785
Total			**85,615**	**50,858**

Change from pre-fire: -34,757

Data Used for the Effects Analysis: The following tables will be used in the discussions of effects of Alternatives 1-4 on snags in green forest habitat (also referred to as hairy woodpecker habitat in this report):

Table 8. Post-fire hairy woodpecker habitat proposed for treatment in Stanislaus National Forest within the Rim Recovery analysis area.

	Salvage		Hazard Tree		Total Treatment
	Acres	% of Treatment	Acres	% of Treatment	Acres
Alternative 1	6,400	47	7,434	53	13,834
Alternative 2	0	0	0	0	0
Alternative 3	6,464	47	7,238	53	13,702
Alternative 4	5,908	45	7,315	55	13,223

Table 9. Summary of hairy woodpecker habitat acres in Stanislaus National Forest within the Rim Recovery analysis area.

CWHR			Post-Fire	Post-Treatment (Alternative 1-4)
BOP	**4,5**	**S,P,M,D**	437	437
BOW	**4,5**	**S,P,M,D**	38	38
JPN	**4,5**	**S,P,M,D**	229	229
LPN	**4,5**	**S,P,M,D**	105	105
MHC	**4,5**	**S,P,M,D**	5,408	5,408
MHW	**4,5**	**S,P,M,D**	3,598	3,598
PPN	**4,5**	**S,P,M,D**	7,264	7,264
RFR	**4,5**	**S,P,M,D**	58	58
SMC	**4,5**	**S,P,M,D**	32,936	32,936
WFR	**4,5**	**S,P,M,D**	785	785
Total			**50,858**	**50,858**
				Change from post-fire: 0

Table 10. Estimates of pre-fire, post-fire, and post-treatment snags per acre in hairy woodpecker habitat within the Rim Recovery analysis area (Stanislaus National Forest only).

Snag Size	Pre-Fire	Post-Fire	Alt. 1 Post-Action	Alt. 2 (No Action)	Alt. 3 Post-Action	Alt. 4 Post-Action
Snags/ac. 15-24" dbh	6	15	2	15	7	8
Snags/ac. >24" dbh	3	8	2	8	4	4

Post-action estimates were derived from acres within salvage units only. We assumed no snags would remain in hazard tree areas, so estimates of snags per acre would be lower if hazard tree areas were included. In salvage units, we assumed that only the number of snags given in the management requirements for mixed conifer would remain post action (red fir represented less than 1% of all the CWHR types in hairy woodpecker habitat so the snag retention requirements for mixed conifer were used to obtain estimates). Because hairy woodpecker habitat included tree size class as small as 4, we could not be certain what size class would be available to achieve snag retention requirements. So, when estimating post-action estimates of snags per acre, we allocated half of the snag retention requirement to the medium (15 to 24 inches dbh) snags category, and half to the large (greater than 24 inches dbh) snags category.

Table 11. Acres of salvage and hazard tree removal in hairy woodpecker (HAWO) habitat within the Rim Recovery cumulative analysis area.

	Post-Fire HAWO Acres in Rim Recovery Cumulative Analysis Area	HAWO Acres Proposed for Salvage or Hazard Tree Removal in Rim Recovery Project	HAWO Acres in All Other Salvage, Hazard Tree, or Green Thinning Projects*	Total HAWO Acres in Salvage, Hazard Tree, or Green Thinning Projects	% HAWO Acres in Salvage, Hazard Tree, or Green Thinning Projects
Alternative 1	96,755	13,834	14,966	28,800	30
Alternative 2	96,755	0	14,966	14,966	15
Alternative 3	96,755	13,702	14,966	28,668	30
Alternative 4	96,755	13,223	14,966	28,189	29

*550 acres of HAWO habitat in Yosemite National Park hazard tree areas.

*7,095 acres of HAWO habitat in private land.

*3,742 acres of HAWO habitat in the Rim Hazard Trees project.
*3,579 acres of HAWO habitat in Forest Service green thinning projects

For the cumulative salvage and hazard tree analysis, we assumed no acres would be salvaged in Yosemite National Park except for 817 acres of hazard tree removal (550 acres within hairy woodpecker habitat), and all acres would be salvaged in private land (see Rim Fire Recovery FEIS (USDA Forest Service 2014) for full list of projects). Burned Area Emergency Response (BAER) treatments were considered but did not count towards acres of habitat affected because only immediate hazards were felled and there was no way to accurately calculate acres affected.

Alternative 1 (Proposed Action)

Direct and Indirect Effects to Habitat. Of the 50,858 acres of suitable hairy woodpecker habitat within the Rim Recovery analysis area, there would be 13,834 acres (27%) treated in Alternative 1. Alternative 1 would not result in a change in green forest acres (Table 9), but would reduce snag abundance in hairy woodpecker habitat (Table 10). Of the 13,834 acres of hairy woodpecker habitat that would be treated, 7,434 acres (53%) would be in hazard tree treatments, and 6,400 acres (47%) would be in salvage units (Table 8).

Salvage within Snags in Green Forest Habitat: Potential direct effects of salvage to habitat would include removal of fire-killed trees. No green trees would be removed within salvage units, so there would be no change in green tree basal area and no change to the CWHR type. Snag recruitment would be higher in areas with 10% to 50% basal area loss (3,283 acres, approximately 50% of the treatment area), as some remaining green trees could die due to stress from the fire. As green trees would not be taken, snag recruitment would not be reduced overall within salvage units.

In Alternative 1, snag retention within salvage units would be either 4 (mixed conifer stand retention level) or 6 (red fir stands) snags per acre regardless of the land allocation. Red fir represents less than 1% of all the CWHR types in hairy woodpecker habitat so the snag retention requirements for mixed conifer were used to obtain estimates of snags per acre. Table 10 shows that Alternative 1 would reduce the average number of snags in hairy woodpecker habitat, post-fire, from approximately 23 snags per acre to approximately 4 per acre (83% reduction).

In addition to the conifer snag requirements, all oak and other hardwood snags greater than 12 inches in diameter would be retained. There are 9,481 acres of hardwood forest (primarily oak) in CWHR types BOW, BOP, MHC, and MHW that could contribute additional snags to the estimate of snags per acre described above.

Hazard Tree Removal in Snags in Green Forest Habitat: Snags would primarily be removed in the moderate and high severity areas (greater than 50% basal area loss), but habitat that is less than 50% burned and unburned areas would also be assessed for hazard tree treatment.

Hazard tree removal would not affect the canopy cover of hairy woodpecker habitat, but would reduce the density of existing snags. Hazard tree removal could also reduce the future recruitment of snags because green hazard trees that are likely to die within a few years could be removed. Of the hazard tree treatment road buffer that encompasses hairy woodpecker habitat, 2,849 acres would be within low (up to 25% basal area loss) to moderate (up to 50% basal area loss) burned habitat and 4,585 acres would be in unburned habitat. Unburned acres would not contribute additional snags in the form of fire damaged trees that die within the next few years, whereas burned areas could have additional die-off/snag recruitment post-action.

Snag deficiencies (i.e. less than the minimum of 4 snags per acre) created by the removal of hazard trees adjacent to units would be compensated for by leaving additional snags

within the units. Roads adjacent to units would comprise less than 10% of the hazard tree portion of the project, so the majority of the snag removal on level 2 roads would not be compensated for. Areas adjacent to the hazard tree treatment areas that contain burned habitat will likely have more tree mortality over time, and potentially increase snag numbers and compensate for those lost along roadsides.

Road Construction: Under Alternative 1 there would be less than one acre of new road construction within hairy woodpecker habitat outside salvage units and hazard tree areas.

Cumulative Effects to Habitat in the Analysis Area. The largest impact to hairy woodpecker habitat was the Rim Fire, which removed 34,757 acres of habitat. Unplanted, hairy woodpecker habitat within the Rim Fire perimeter would take many years (possibly over a hundred) to reach a CWHR size class 4 tree that would become a medium snag.

There are several present and foreseeable actions within the cumulative analysis area. These include various private owners, Stanislaus National Forest, and Yosemite National Park. See the Rim Fire Recovery FEIS (USDA Forest Service 2014) for a complete listing of projects associated with these areas.

There are 83 acres of Forest Service restoration projects such as soil rehabilitation, meadow restoration, culvert removal/replacement, and weeds removal that would have minimal to no long-term cumulative impacts on woodpecker habitat, because habitat would not be removed, green tree removal would not change the CWHR type, and/or snags would not be targeted for removal. Recreation and livestock grazing would have little to no impact on hairy woodpecker habitat.

Table 11 shows the projects that affect suitable hairy woodpecker habitat, present and future, for each alternative. There are 7 green thinning projects associated with the Stanislaus National Forest comprising 4,394 acres within the analysis area, of which 3,579 acres are within suitable habitat. Green thinning projects would not change acres of hairy woodpecker habitat because the focus of those projects would be to thin the forest without converting vegetation type or size. Snag removal would be minimal and would generally only occur for safety concerns.

Within the cumulative analysis area, there would be 67,955 acres of hairy woodpecker habitat that would not be impacted by salvage or other projects, if all actions occurred as described. Of the 28,800 acres of habitat impacted by project activities, it is assumed that 3,579 acres (4% of post-fire habitat) would have minimal effects from green thinning, 7,095 acres (7% of post-fire habitat) would be totally removed on private lands, and 18,126 acres (19% of post-fire habitat) would have reduced capacity for supporting hairy woodpecker from salvage and hazard tree removal.

Cumulative Effects Conclusion: Alternative 1 would minimally impact snags within hairy woodpecker habitat because dead trees would be removed primarily from areas that burned at high/moderate severity rather than green forest. Within

salvage units, no green trees would be taken so CWHR types would not change. In hazard tree areas with green forest, hazardous trees would be removed, but CWHR types would not change and approximately 50% of this habitat is adjacent to burned areas that would recruit snags over the next several years. Although 19% of post-fire habitat would have a reduced capability to support the hairy woodpecker, that habitat would remain and have the capacity to regenerate snags over time. There would be no direct habitat reduction as a result of Alternative 1 and there would be no alteration to the existing trend in this ecosystem component.

Alternative 2 (No Action)

Direct and Indirect Effects to Habitat. Under Alternative 2, salvage, hazard tree abatement and removal, and road construction would not occur. There would be no direct effects resulting from implementation of this alternative. However, if no fuels reduction occurred, hairy woodpecker habitat would remain vulnerable to future stand-replacing fire.

Cumulative Effects to Habitat in the Analysis Area. As there would be no direct effects to hairy woodpecker habitat from Alternative 2, cumulative effects would be largely limited to the non-Rim Recovery projects described in Alternative 1. However, because Alternative 2 proposes to not remove snags, the accumulation of surface fuels could increase the risk of high severity fire in remaining or regenerating habitat (Rim Fire Recovery FEIS, chapter 3, fire and fuels section 3.05 (USDA Forest Service 2014)). The green thinning projects described under Alternative 1 cumulative effects could possibly mitigate a small amount of the risk if implemented.

Cumulative Effects Conclusion: Alternative 2 would not alter the structural components of hairy woodpecker habitat. There would be no direct habitat reduction as a result of Alternative 2 and there would be no alteration to the existing trend in this ecosystem component.

Alternative 3

Direct and Indirect Effects to Habitat. There would be 13,702 acres of suitable hairy woodpecker habitat treated in Alternative 3. Alternative 3 would not result in a change in green forest acres (Table 9), but as with the other action alternatives, would result in a reduction in snags (Table 10) and reduce the capability of hairy woodpecker habitat.

Alternative 3 would treat 132 acres less than Alternative 1 (less than 1% change). There would be 7,238 acres (53%) in the hazard tree treatment area, and 6,464 acres (47%) in salvage units; a slight increase in salvage acres, and a decrease in hazard tree acres compared to Alternative 1 (Table 8). There would be no difference in the percentage of hairy woodpecker habitat treated in each type of treatment.

Salvage within Snags in Green Forest Habitat: The primary difference between Alternative 1 and Alternatives 3 and 4 would be the management requirements for snag retention. For alternative 3 and 4, it is assumed that in salvage units only 4 snags per acre would remain post-action in general forest; 30 square feet of snag basal area in Old Forest Emphasis Areas, Home Range Core Areas, the Forest Carnivore Connectivity Corridor, and high salvage study units of the USDA Forest Service Pacific Southwest Research Station (PSW); and 120 square feet of snag basal area in PSW's low salvage study area.

Table 10 shows the number of snags per acre pre and post-fire and for all alternatives in salvage units. Alternative 3 would reduce the average number of snags within hairy woodpecker habitat from approximately 23 snags per acre to approximately 11 snags per acre (52% reduction). This would retain 7 snags per acre more than Alternative 1, so the effects of Alternative 3 on the structural component of suitable habitat would be less than Alternative 1. In Alternative 3, as in Alternatives 1 and 4, oak and other hardwood snags greater than 12 inches in diameter would be retained, which would increase the amount of snags per acre.

Hazard Tree Removal in Snags in Green Forest Habitat: Of the hazard tree areas that encompass hairy woodpecker habitat, 2,753 acres would be within low (up to 25% basal area loss) to moderate (up to 50% basal area loss) burned habitat and 4,485 acres would be in unburned habitat. The amount of burned habitat outside the hazard tree treatment zone that is available for snag recruitment is similar to Alternative 1.

Direct and indirect effects of hazard tree removal under Alternative 3 would be the same as Alternative 1 except there are 196 more acres of habitat that would be impacted in Alternative 1.

Road Construction: Under Alternative 3 there would be less than one acre of new road construction within hairy woodpecker habitat outside treatment areas.

Cumulative Effects to Habitat in the Analysis Area. The percentage of habitat retained long-term in Alternative 3 would be the same as for Alternative 1, but there would be 28,668 acres within project footprints in Alternative 3 and 28,800 acres in Alternative 1 (Table 11).

> **Cumulative Effects Conclusion:** The cumulative effects conclusion is the same as for Alternative 1. There would be no direct habitat reduction as a result of Alternative 3 and there would be no alteration to the existing trend in this ecosystem component.

<u>Alternative 4</u>

Direct and Indirect Effects to Habitat. There would be 13,223 acres of suitable hairy woodpecker habitat treated in Alternative 4. Alternative 4 would treat 611 acres of suitable hairy woodpecker habitat less than Alternative 1 (5% less), and 479 acres less than Alternative 3 (4% less), so overall there would be a smaller effect on suitable habitat

capability for Alternative 4 compared to Alternatives 1 and 3. The difference in total habitat capability reduction between all three alternatives would be minimal, so there would be little difference in the scale of effects on green forest habitat. See Table 8 for a comparison of acres affected by Alternatives 1-4.

Salvage within Snags in Green Forest Habitat: There would be 5,908 acres planned for salvage in hairy woodpecker habitat. This would be 492 fewer acres than Alternative 1 and 556 fewer acres than Alternative 3. Alternative 4 would have the least effects from salvage on suitable hairy woodpecker habitat of all action alternatives.

Alternatives 3 and 4 would have the same management requirements for snag retention, but would have different numbers of acres in each land allocation/retention category; Alternative 1 would retain 4 snags per acre regardless of the land allocation. Alternative 4 salvage units would reduce the number of snags in hairy woodpecker habitat from approximately 23 snags per acre to approximately 12 snags per acre (48% reduction). This would retain one more snag per acre than Alternative 3 and 8 more snags per acre than Alternative 1 (Table 10). After implementation of Alternative 3 or 4, there would still be greater numbers of snags than were present pre-fire (22% and 33% greater respectively). As with Alternatives 1 and 3, oak and other hardwood snags greater than 12 inches in diameter would be retained.

Hazard Tree Removal in Snags in Green Forest Habitat: There would be 7,315 acres of roadside hazard tree treatments within Alternative 4, which is similar to Alternatives 1 and 3 (within 2%). Therefore the effects would be similar to Alternatives 1 and 3.

Of the hazard tree treatment footprint that encompasses hairy woodpecker habitat, 2,824 acres would be within low (up to 25% basal area loss) to moderate (up to 50% basal area loss) burned habitat and 4,491 acres would be in unburned. The amount of burned habitat outside the hazard tree treatment zone that would be available for snag recruitment would be similar to Alternatives 1 and 3.

Direct and indirect effects of hazard tree removal on habitat and snags would be similar under all action alternatives as the percentage of habitat acres affected would be the same. In Alternative 4 there would be 77 more acres of hairy woodpecker habitat in hazard tree treatments than Alternative 3, and 119 acres less than Alternative 1.

Road Construction: Under Alternative 4 there would be less than one acre of new road construction within hairy woodpecker habitat outside treatment areas.

Cumulative Effects to Habitat in the Analysis Area. The percentage of habitat retained long-term in Alternative 4 would be similar to Alternatives 1 and 3, but there would be 28,189 acres within project footprints in Alternative 4 compared to 28,800 acres in Alternative 1, and 28,668 acres in Alternative 3 (Table 11).

Cumulative Effects Conclusion: The cumulative effects conclusion is the same as for Alternatives 1 and 3. There would be no direct habitat reduction as a result

of Alternative 4 and there would be no alteration to the existing trend in this ecosystem component.

Summary of Hairy Woodpecker Status and Trend at the Bioregional Scale
The Stanislaus NF LRMP (as amended by the SNF MIS Amendment) requires bioregional-scale habitat and distribution population monitoring for the hairy woodpecker; hence, the snag effects analysis for the Rim Recovery Project must be informed by both habitat and distribution population monitoring data. The sections below summarize the habitat and distribution population status and trend data for the hairy woodpecker. This information is drawn from the detailed information on habitat and distribution population trends in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a), which is hereby incorporated by reference.

Ecosystem Component Status and Trend. The current average number of medium-sized and large-sized snags (≥ 15" dbh, all decay classes) per acre across major coniferous and hardwood forest types (westside mixed conifer, ponderosa pine, white fir, productive hardwoods, red fir, eastside pine) in the Sierra Nevada ranges from 1.5 per acre in eastside pine to 9.1 per acre in white fir. In 2008, snags in these types ranged from 1.4 per acre in eastside pine to 8.3 per acre in white fir (USDA Forest Service 2008).

Data from the early-to-mid 2000s were compared with the current data to calculate the trend in total snags per acre by Regional forest type for the 10 Sierra Nevada national forests and indicate that, during this period, snags per acre increased within westside mixed conifer (+0.76), white fir (+2.66), productive hardwoods (+0.35), and red fir (+1.25) and decreased within ponderosa pine (-0.16) and eastside pine (-0.14) Detailed information by forest type, snag size, and snag decay class can be found in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

Population Status and Trend. Monitoring of the hairy woodpecker across the ten National Forests in the Sierra Nevada has been conducted since 2009 in partnership with PRBO Conservation Science, as part of a monitoring effort (USDA Forest Service 2010a, http://data.prbo.org/partners/usfs/snmis/). Hairy woodpeckers were detected on 15.1% of 1659 point counts (and 25.2% of 424 playback points) in 2009 and 16.7% of 2266 point counts (and 25.6% of 492 playback points) in 2010, with detections on all 10 national forests in both years. The average abundance (number of individuals recorded on passive point count surveys) was 0.116 in 2009 and 0.107 in 2010. These data indicate that hairy woodpeckers continue to be distributed across the 10 Sierra Nevada National Forests. In addition, the hairy woodpeckers continue to be monitored and surveyed in the Sierra Nevada at various sample locations by avian point count and breeding bird survey protocols. These are summarized in the 2008 Bioregional Monitoring Report (USDA Forest Service 2008).Current data at the rangewide, California, and Sierra Nevada scales indicate that the distribution of hairy woodpecker populations in the Sierra Nevada is stable.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Hairy Woodpecker Trend. There would be no change in CWHR stand type acres in any of the green forest habitat

that provides medium to large-sized snags under all Rim Recovery Project alternatives. There would be a short-term loss of snags within the analysis area which would add to the deficit of snags in suitable snag producing habitat. Over time, there could be an increase in the number of snags in green forest if trees that were stressed from the Rim Fire die within hairy woodpecker habitat.

The potential reduction in medium to large-sized snags per acre on up to 13,834 acres out of the approximately 50,858 acres of habitat within the analysis area would not alter the existing trend in hairy woodpecker habitat, nor would it lead to a change in the distribution of hairy woodpeckers across the Sierra Nevada bioregion.

Snags in Burned Forest Ecosystem Component (black-backed woodpecker)

Habitat/Species Relationship.
The black-backed woodpecker was selected as the MIS for the ecosystem component of snags in burned forests. Recent data indicate that black-backed woodpeckers are dependent on snags created by stand-replacement fires (Hutto 1995, Kotliar et al. 2002, Smucker et al. 2005). The abundant snags associated with severely burned forests provide both prey (by providing food for the specialized beetle larvae that serve as prey) and nesting sites (Hutto and Gallo 2006).

Project-level Effects Analysis – Snags in Burned Forest Ecosystem Component

Parameters Used to Identify Burned Forest for the Analysis:

- CWHR types: Douglas-fir (DFR), Jeffrey pine (JPN), lodgepole pine (LPN), ponderosa pine (PPN), red fir (RFR), subalpine conifer (SCN), Sierran mixed conifer (SMC), and white fir (WFR).
- CWHR sizes greater than or equal to 3.
- CWHR canopy closures M and D.
- Basal area loss greater than or equal to 50%.

Habitat criteria were determined from CWHR (CDFG 2008), scientific literature (e.g., Russell et al. 2007, Hanson and North 2008, Vierling et al. 2008, Forristal 2009, Bond et al. 2012, Siegel et al. 2013) and USDA Forest Service Region 5 Regional Office guidance. The CWHR sizes and canopy closures listed above were included in the analysis because black-backed woodpeckers are known to nest and/or forage in these size and canopy closure classes (Bond et al. 2012). Forest with less than 50% basal area loss was not chosen to represent burned forest (black-backed woodpecker habitat) because visual inspection of post-fire imagery (pan-sharpened Worldview 8bit, 9/28/13) and field checks indicated that these areas burned at lower intensities, and black-backed woodpeckers are primarily associated with higher burn severities (Russell et al. 2007, Hanson and North 2008, Vierling et al. 2008, Forristal 2009, Bond et al. 2012, Siegel et al. 2013). We recognize that forest with approximately 50% basal area loss may be a transition habitat, but chose the parameters listed above using best available information and USDA Forest Service Region 5 Regional Office guidance.

Habitat Factor(s) for the Analysis: (1) Medium (15-24 inches dbh) snags per acre within burned forest created by stand-replacing fire. (2) large (greater than 24 inches dbh) snags per acre within burned forest created by stand-replacing fire. Twenty-four inches dbh was used to separate medium from large trees rather than 30 inches dbh because common stand exam data available for this project was separated at 24 inches dbh.

Current Condition of the Habitat Factor(s) in the Project Area: Prior to the Rim Fire, there were very few acres of burned forest suitable for black-backed woodpeckers within the Rim Recovery analysis area. Exact acres could not be calculated because snag retention from previous fires and the associated projects were based on numbers of snags, not acres of snag patches. However, only low snag densities were retained and many of those snags have likely fallen. Therefore it is reasonable to assume that there were very few acres of burned forest suitable for black-backed woodpeckers prior to the Rim Fire.

The Rim Fire increased snags in burned forest habitat to 27,614 acres in Stanislaus National Forest within the Rim Recovery analysis area. Most of the burned forest habitat created by the Rim Fire is in the Sierra mixed conifer habitat type (Table 13). Within the Rim Recovery cumulative analysis area, there are now 51,170 acres of snags in burned forest habitat.

Data Used for the Effects Analysis: The following tables will be used in the discussions of effects of Alternatives 1-4 on snags in burned forest:

Table 12. Post-fire black-backed woodpecker habitat proposed for treatment in Stanislaus National Forest within the Rim Recovery analysis area.

	Salvage		Hazard Tree		Total Treatment
	Acres	% of Treatment	Acres	% of Treatment	Acres
Alternative 1	16,099	92	1,362	8	17,461
Alternative 2	0	0	0	0	0
Alternative 3	15,311	92	1,322	8	16,633
Alternative 4	13,640	89	1,621	11	15,261

Table 13. Summary of snags in burned forest (black-backed woodpecker habitat) acres in Stanislaus National Forest within the Rim Recovery analysis area.

CWHR			Post-Fire	Alternative 1 Post-Action	Alternative 2 (No Action)	Alternative 3 Post-Action	Alternative 4 Post-Action
JPN	**3**	**M,D**	15	12	15	9	11
JPN	**4,5**	**M,D**	29	21	29	21	22
LPN	**3**	**M,D**	86	43	86	32	32
LPN	**4,5**	**M,D**	287	130	287	100	100
PPN	**3**	**M,D**	1,843	1,286	1,843	1,231	1,237
PPN	**4,5**	**M,D**	5,759	2,066	5,759	2,171	2,230

RFR	**3**	**M,D**	0	0	0	0	0
RFR	**4,5**	**M,D**	1	1	1	1	1
SMC	**3**	**M,D**	1,747	1,138	1,747	1,138	1,222
SMC	**4,5**	**M,D**	17,757	5,445	17,757	6,260	7,473
WFR	**3**	**M,D**	0	0	0	0	0
WFR	**4,5**	**M,D**	91	12	91	18	27
Total			**27,614**	**10,153**	**27,614**	**10,981**	**12,354**
				Change From Post-Fire: -17,461	**Change From Post-Fire: 0**	**Change From Post-Fire: -16,633**	**Change From Post-Fire: -15,261**

Table 14. Estimates of pre-fire, post-fire, and post-treatment snags per acre in black-backed woodpecker habitat within the Rim Recovery analysis area (Stanislaus National Forest only).

Snag Size	Pre-Fire	Post-Fire	Alternative 1 Post-Action	Alternative 2 (No Action)	Alternative 3 Post-Action	Alternative 4 Post-Action
Snags/ac. 15-24"dbh	6	38	4	38	7	7
Snags/ac. >24" dbh	3	21	4	21	4	4

Post-action estimates were derived from acres within salvage units only. We assumed no snags would remain in hazard tree areas, so estimates of snags per acre would be lower if hazard tree areas were included. In salvage units, we assumed that only the number of snags given in the management requirements for mixed conifer would remain post action (red fir only represented 2% of all the CWHR types in black-backed woodpecker habitat so snag retention requirements for mixed conifer were used to obtain estimates). Because black-backed woodpecker habitat included tree size class as small as 3, we could not be certain what size class would be available to achieve snag retention requirements. So, when estimating post-action estimates of snags per acre, we allocated half of the snag retention requirement to the medium (15 to 24 inches dbh) snags category, and half to the large (greater than 24 inches dbh) snags category.

Table 15. Acres of black-backed woodpecker habitat by land ownership within the Rim Recovery cumulative analysis area.

	Stanislaus NF	Yosemite NP	BLM*	Private	Total
Acres Post-Fire	27,614	17,479	17	6,060	51,170

*Bureau of Land Management

Table 16. Acres of salvage and hazard tree removal in black-backed woodpecker (BBWO) habitat within the Rim Recovery cumulative analysis area.

	Post-Fire BBWO Acres in Rim Recovery Cumulative Analysis Area	BBWO Acres Proposed for Salvage or Hazard Tree Removal in Rim Recovery Project	BBWO Acres in All Other Salvage or Hazard Tree Projects*	Total BBWO Acres Salvaged or in Hazard Tree Projects	% BBWO Acres Salvaged or in Hazard Tree Projects
Alternative 1	51,170	17,461	8,473	25,934	51
Alternative 2	51,170	0	8,473	8,473	17
Alternative 3	51,170	16,633	8,473	25,106	49
Alternative 4	51,170	15,261	8,473	23,734	46

*43 acres of BBWO habitat in Yosemite National Park hazard tree areas.

*6,060 acres of BBWO habitat in private land.

*2,370 acres of BBWO habitat in the Rim Fire Hazard Trees project.

For the cumulative salvage and hazard tree analysis, we assumed no acres would be salvaged in Yosemite National Park except for 817 acres of hazard tree removal (43 acres within black-backed woodpecker habitat), no acres would be salvaged in BLM land, and all acres would be salvaged in private land (see Rim Fire Recovery FEIS (USDA Forest Service 2014) for full list of projects). Burned Area Emergency Response (BAER) treatments were considered but did not count towards acres of habitat affected because only immediate hazards were felled and there was no way to accurately calculate acres affected.

Alternative 1 (Proposed Action)

Direct and Indirect Effects to Habitat. Removal of snags in salvage units and hazard tree areas would be the primary effect to black-backed woodpecker habitat in Alternative 1 of the Rim Recovery Project. Alternative 1 would negatively affect the greatest amount of black-backed woodpecker habitat of all the alternatives in this report. Within black-backed woodpecker habitat, Alternative 1 proposes approximately 16,099 acres of salvage harvest (92% of total treatment) and 1,362 acres of hazard tree treatment (8% of total treatment; Table 12). Total treatment would be 17,461 acres out of the 27,614 acres (63%) of black-backed woodpecker habitat in Stanislaus National Forest within the Rim Recovery analysis area (Tables 12 and 13).

In salvage units, we assume that only 4 snags per acre would remain post-action because that is the retention level specified for mixed conifer in the management requirements. Medium sized snags would be reduced from approximately 38 per acre to 4 per acre. Large snags would be reduced from approximately 21 per acre to 4 per acre (Table 14). For this analysis we assume no snags per acre would remain in hazard tree areas, although some snags would likely not be hazardous and could be left standing. If some snags remained standing, they could potentially provide additional acres of habitat and snags per acre to the numbers presented in this report.

There would be less than 1 acre of new road construction within black-backed woodpecker habitat outside of salvage units and hazard tree removal areas; all other new road construction would be within salvage units or hazard tree removal areas so would not count towards additional acres of affected habitat.

Cumulative Effects to Habitat in the Analysis Area. Black-backed woodpecker habitat within the Rim Recovery cumulative analysis area is displayed by ownership in Table 15. These acres form the baseline of the cumulative effects analysis.

Salvage and hazard tree projects within black-backed woodpecker habitat that would be additional to the Rim Recovery Project include: the Forest Service's Rim Fire Hazard Trees (2,370 acres affected), Yosemite National Park hazard trees (43 acres affected), and private land salvage/hazard trees (6,060 acres affected). Total acres affected by salvage and hazard tree projects including the Rim Recovery Project would be 25,934 (51%; Table 16).

For this analysis we assume no snags per acre would remain in the areas described above, although in hazard tree areas, some snags would likely not be hazardous and could be left standing. We also assume all snags in private land would be removed, although non-timber industry owned private land would likely leave some snags standing. Therefore, a high estimate of black-backed woodpecker habitat removed following Alternative 1 and all other present and foreseeable actions would be 25,934 acres (51%). There would be 25,236 acres (49%) of black-backed woodpecker habitat remaining.

There are 115 acres of present and foreseeable green forest projects within black-backed woodpecker habitat (see Rim Fire Recovery FEIS (USDA Forest Service 2014) for a full list of projects and justification regarding the consideration of past actions). Green thinning projects account for 97 of those acres. Green thinning would not change acres of burned forest habitat because the focus of those projects would be to thin green forest without converting vegetation type, size, or canopy cover. Snag removal would be minimal and would generally only occur for safety concerns. There are 18 acres of restoration activities within black-backed woodpecker habitat that would not change snag density, vegetation type, size, or canopy cover.

> **Cumulative Effects Conclusion:** The Rim Fire created approximately 51,170 acres of black-backed woodpecker habitat. Although Alternative 1 in combination with all other present and foreseeable actions would reduce suitable habitat by 25,934 acres (51%), there would be 25,236 acres (49%) remaining. Due to the large amount of black-backed woodpecker habitat retained, Alternative 1 would not alter the existing trend in the ecosystem component.

<u>Alternative 2 (No Action)</u>

Direct and Indirect Effects to Habitat. There would be no removal of trees, road construction, or any other project activities under the no action alternative. Because black-backed woodpeckers are positively associated with high densities of snags

(Vierling et al. 2008, Forristal 2009), the no action alternative would benefit black-backed woodpecker habitat more than all other alternatives discussed in this report.

Cumulative Effects to Habitat in the Analysis Area. Under Alternative 2, no removal of trees, road construction, or any other project activities would occur as part of the Rim Recovery Project. We assume all of the other salvage and hazard tree projects described in Alternative 1 cumulative effects would still occur. This would result in a loss of 8,473 acres (17%) of black-backed woodpecker habitat (Table 16). There would be 42,697 acres (83%) of black-backed woodpecker habitat remaining.

> **Cumulative Effects Conclusion:** Because of the large amount of black-backed woodpecker habitat retained (42,697 acres; 83%), Alternative 2 would not alter the existing trend in the ecosystem component.

Alternative 3

Direct and Indirect Effects to Habitat. Snag removal in salvage units and hazard tree areas would be the primary effect to black-backed woodpecker habitat in Alternative 3 of the Rim Recovery Project. Alternative 3 would negatively affect less black-backed woodpecker habitat than Alternative 1, but more than the other alternatives discussed in this document. Alternative 3 proposes approximately 15,311 acres of salvage harvest (92% of total treatment) and 1,322 acres of hazard tree area (8% of total treatment) within black-backed woodpecker habitat (Table 12). Total treatment would be 16,633 acres out of the 27,614 acres (60%) of black-backed woodpecker habitat in Stanislaus National Forest within the Rim Recovery analysis area (Tables 12 and 13).

In salvage units, we assume that only 4 snags per acre would remain post-action in general forest; 30 square feet of snag basal area in Old Forest Emphasis Area, Home Range Core Area, Forest Carnivore Connectivity Corridor, and high salvage study units of the USDA Forest Service Pacific Southwest Research Station (PSW); and 120 square feet of snag basal area in PSW's low salvage study units. These are the retention levels specified in the management requirements for Alternative 3. Of black-backed woodpecker habitat within salvage units, 54% is in general forest, 41% is in the 30 square foot basal area category, and 4% is in the 120 square foot basal area category. For consistency in this report, snag basal area was converted to snags per acre using the methods described in Section 5 of this document. Results show that in salvage units under Alternative 3, medium sized snags would be reduced from approximately 38 per acre to 7 per acre. Large snags would be reduced from approximately 21 per acre to 4 per acre (Table 14). For this analysis we assume no snags per acre would remain in hazard tree areas, although some snags would likely not be hazardous and could be left standing. If some snags remained standing, they could potentially provide additional acres of habitat and snags per acre to the numbers presented in this report.

Outside of salvage units and hazard tree removal areas, there would be no acres of new road construction within black-backed woodpecker habitat; all new road construction

would be within salvage units or hazard tree removal areas so would not count towards additional acres of affected habitat.

Cumulative Effects to Habitat in the Analysis Area. We assume all of the present and foreseeable salvage and hazard tree projects described in Alternative 1 cumulative effects would occur. Total acres affected by salvage and hazard tree projects including the Rim Recovery Project under Alternative 3 would be 25,106 (49%; Table 16). There would be 26,064 acres (51%) of black-backed woodpecker habitat remaining.

> **Cumulative Effects Conclusion:** The Rim Fire created approximately 51,170 acres of black-backed woodpecker habitat. Although Alternative 3 in combination with all other present and foreseeable actions would reduce suitable habitat by 25,106 acres (49%), there would be 26,064 acres (51%) remaining. Due to the large amount of black-backed woodpecker habitat retained, Alternative 3 would not alter the existing trend in the ecosystem component.

Alternative 4

Direct and Indirect Effects to Habitat. Removal of snags in salvage units and hazard tree areas would be the primary effect to black-backed woodpecker habitat in Alternative 4 of the Rim Recovery Project. Alternative 4 would retain the most black-backed woodpecker habitat of all action alternatives in this report. Under Alternative 4, approximately 13,640 acres would be proposed for salvage harvest (89% of total treatment) and 1,621 acres would be proposed for hazard tree treatment (11% of total treatment) within black-backed woodpecker habitat (Table 12). Total treatment would be 15,261 acres out of the 27,614 acres (55%) of black-backed woodpecker habitat in Stanislaus National Forest within the Rim Recovery analysis area (Tables 12 and 13).

In salvage units, we assume that only 4 snags per acre would remain post-action in general forest; 30 square feet of snag basal area in Old Forest Emphasis Area, Home Range Core Area, Forest Carnivore Connectivity Corridor, and high salvage study units of the USDA Forest Service Pacific Southwest Research Station (PSW); and 120 square feet of snag basal area in PSW's low salvage study units. These are the retention levels specified in the management requirements for Alternative 4. Of black-backed woodpecker habitat within salvage units, 54% is in general forest, 41% is in the 30 square foot basal area category, and 5% is in the 120 square foot basal area category. For consistency in this report, snag basal area was converted to snags per acre using the methods described in Section 5 of this document. Results show that in salvage units under Alternative 4, medium sized snags would be reduced from approximately 38 per acre to 7 per acre. Large snags would be reduced from approximately 21 per acre to 4 per acre (Table 14). For this analysis we assume no snags per acre would remain in hazard tree areas, although some snags would likely not be hazardous and could be left standing. If some snags remained standing, they could potentially provide additional acres of habitat and snags per acre to the numbers presented in this report.

No new road construction would take place within black-backed woodpecker habitat outside of salvage units or hazard tree removal areas; all new road construction would be within salvage units or hazard tree removal areas so would not count towards additional acres of affected habitat.

Cumulative Effects to Habitat in the Analysis Area. We assume all of the present and foreseeable salvage and hazard tree projects described in Alternative 1 cumulative effects would occur. Total acres affected by salvage and hazard tree projects including the Rim Recovery Project under Alternative 4 would be 23,734 (46%; Table 16). There would be 27,436 acres of black-backed woodpecker habitat remaining.

Cumulative Effects Conclusion: The Rim Fire created approximately 51,170 acres of black-backed woodpecker habitat. Although Alternative 4 in combination with all other present and foreseeable actions would reduce suitable habitat by 23,734 acres, there would be 27,436 acres remaining. Due to the large amount of black-backed woodpecker habitat retained, Alternative 4 would not alter the existing trend in the ecosystem component.

Summary of Black-backed Woodpecker Status and Trend at the Bioregional Scale
The Stanislaus NF LRMP (as amended by the SNF MIS Amendment) requires bioregional-scale habitat and distribution population monitoring for the black-backed woodpecker; hence, the snags effects analysis for the Rim Recovery Project must be informed by both habitat and distribution population monitoring data. The sections below summarize the habitat and distribution population status and trend data for the black-backed woodpecker. This information is drawn from the detailed information on habitat and distribution population trends in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a), which is hereby incorporated by reference.

Ecosystem Component Status and Trend. The current average number of medium-sized and large-sized snags (≥ 15" dbh, all decay classes) per acre across major coniferous and hardwood forest types (westside mixed conifer, ponderosa pine, white fir, productive hardwoods, red fir, eastside pine) in the Sierra Nevada ranges from 1.5 per acre in eastside pine to 9.1 per acre in white fir. In 2008, snags in these forest types ranged from 1.4 per acre in eastside pine to 8.3 per acre in white fir (USDA Forest Service 2008).

Data from the early-to-mid 2000s were compared with the current data to calculate the trend in total snags per acre by Regional forest type for the 10 Sierra Nevada national forests and indicate that, during this period, snags per acre increased within westside mixed conifer (+0.76), white fir (+2.66), productive hardwoods (+0.35), and red fir (+1.25) and decreased within ponderosa pine (-0.16) and eastside pine (-0.14).

Detailed information by forest type, snag size, and snag decay class can be found in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

These data include snags in both green forest and burned forest. Between 2000 and 2007, 211,000 acres underwent severe burn and 176,000 acres underwent moderate burn in the Sierra Nevada.

The table below displays information from the Forest Service regional cumulative effects analysis for black-backed woodpeckers in California (USDA Forest Service 2013):

Table 17. Amount of burned suitable Black-backed Woodpecker habitat that has been subsequently treated (tree removal) or untreated (no tree removal) within the range of the Black-backed Woodpecker in California from fires occurring in 2005-2012 of different burn severity categories (high, moderate, and low). Treated acres from 2012 fires are estimated based on proposed salvage work occurring in 2013 on 12,398 acres in suitable Black-backed Woodpecker habitat. Data are broken down by landowner (Forest Service, National Park Service, and Other) or summed for "all" lands.

	Treated		Untreated		Total		Percent Treated	
Burn severity	**Hi/M/ Lo**	**Hi/M**	**Hi/M/ Lo**	**Hi/M**	**Hi/M/ Lo**	**Hi/M**	**Hi/M/ Lo**	**Hi/M**
FS lands [a]	41,326	38,100	743,106	390,446	784,432	428,546	5.3%	8.9%
NPS lands [b]	0	0	40,744	23,448	40,744	23,448	0.0%	0.0%
Other lands [c]	124,590	91,591	0	0	124,590	91,591	100.0%	100.0%
All lands [d]	165,916	129,690	783,850	413,894	949,766	543,584	17.5%	23.9%

[a] Treated values include 12,398 acres that burned in 2012 and are proposed for treatment in 2013. The burn severity is not known for the 12,398 acres, so they are included in BOTH burn severity categories.

[b] For NPS lands we assumed no burned acres were treated. Only fires that burned on both Forest Service and NPS lands are included (see text) so we likely underestimate untreated acres.

[c] For Other lands we assumed that all of the burned acres were treated.

[d] For All lands we summed values for FS, NPS, and Other lands.

Population Status and Trend. Monitoring of the black-backed woodpecker across the 10 National Forests in the Sierra Nevada has been conducted since 2008 in partnership with the Institute for Bird Populations (IBP) (USDA Forest Service 2010a, http://www.birdpop.org/Sierra/bbwo.htm). In 2008, black-backed woodpeckers were detected at 68 survey stations distributed across 10 of the 19 fire areas surveyed. In 2009, black-backed woodpeckers were detected at 169 survey station distributed across 28 of the 51 fire areas surveyed. In both years, occupied sites were well distributed across the Sierra Nevada national forests, included burned areas of a variety of sizes, and included areas 1 to 10 years post-fire. These data indicate that black-backed woodpeckers continue to be distributed across the 10 Sierra Nevada National Forests. Additionally, mean occupancy probability for stations surveyed during 2009 was 0.253 (95% credible interval: 0.222 – 0.289); applying this probability across the 10 national forests yields an estimate that approximately 81,814 ha (25.3%) (range of 71,921 – 93,610 ha) of the 323,358 ha of burned forest (burned between 1999 and 2008) on the ten national forest units within monitoring area was occupied by Black-backed Woodpeckers in 2009. In

addition, the black-backed woodpeckers continue to be surveyed in the Sierra Nevada at various sample locations by avian point count, spot mapping, mist-net, and breeding bird survey protocols. These are summarized in the 2008 Bioregional Monitoring Report (USDA Forest Service 2008). Current data at the rangewide, California, and Sierra Nevada scales indicate that the distribution of black-backed woodpecker populations in the Sierra Nevada is stable.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Black-Backed Woodpecker Trend. As described in the effects analyses under each alternative, a large amount of black-backed woodpecker habitat would be retained under all alternatives. The reduction in black-backed woodpecker habitat on up to 17,461 acres out of the 27,614 acres of habitat within the analysis area would not alter the existing trend in black-backed woodpecker habitat, nor would it lead to a change in the distribution of black-backed woodpeckers across the Sierra Nevada bioregion.

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Appendix A

The table below displays the method used for converting pre-fire CWHR (2005) to post-fire CWHR for the Rim Recovery Project. The U.S. Forest Service Region 5 Regional Office

provided guidance on this methodology based on the habitat types that occur within the Rim Recovery Project cumulative analysis area.

CWHR Vegetation Type	% Basal Area Mortality	Post-Fire Typing Convention
Sierran Mixed Conifer (SMC) Douglas-Fir (DFR) White Fir (WFR) Red Fir (RFR) Ponderosa Pine (PPN) Jeffrey Pine (JPN) Lodgepole Pine (LPN) Subalpine Conifer (SCN)	0-25	No change
	25-50	No change in type or size but, density D or M to P, P to S, and S stays S
	50-75	No change in type or size class but, density D or M or P to S, and S stays S
	75-90	Change type to MCP, but size to 1 and density to "null"
	> 90	Change type to MCP, but size to 1 and density to "null"
Montane Hardwood-Conifer (MHC)	0-25	No change
	25-50	No change in type or size, but density D to M, M to P, P to S, and S stays S
	50-75	No change in type or size, but density D or M to S, P or S to S
	75-90	No change in type, but size to 1 and density D or M or P to S
	> 90	No change in type, but size to 1 and density D or M or P to S
Perennial Grassland (PGS) Cropland (CRC) Mixed Chaparral (MCH) Montane Chaparral (MCP) Wet Meadow (WTM) Pasture (PAS) Annual Grassland (AGS) Barren (BAR) Urban (URB) Water (WAT)	0-100	No Change
Blue Oak Woodland (BOW) Blue Oak-Foothill Pine (BOP) Montane Riparian (MRI) Montane Hardwood (MHW)	0-25	No change
	25-50	No change in type or size, but density D or M to P, P to S, and S stays S
	50-75	No change in type or size, but density D or M or P to S, S stays S
	75-90	No change in type, but size to 1 and density D or M or P to S

Aspen (ASP)	> 90	No change in type, but size to 1 and density D or M or P to S