

**Migratory and Landbird Conservation Report
for the Rim Fire Recovery Project
on the Stanislaus National Forest**

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FINAL

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1. Migratory Landbird Species Management

Under the National Forest Management Act (NFMA), the Forest Service is directed to “provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives.” [P.L. 94-588, Sec 6 (g) (3) (B)]. The January 2000 USDA Forest Service (FS) Landbird Conservation Strategic Plan, Executive Order 13186 (2001), Partners in Flight [PIF, (2002; 2004)] specific habitat Conservation Plans for birds, the Sierra Nevada Forest Plan Final Supplemental Environmental Impact Statement (FSEIS, USDA 2004) and the January PIF North American Landbird Conservation Plan (Rich et al., 2004) all reference goals and objectives for integrating bird conservation into forest management and planning.

Migratory birds are defined as species protected by the Migratory Bird Treaty Act of 1918 (<https://www.fws.gov/migratorybirds/RegulationsPolicies/mbta/mbtintro.html>). The criteria for a migratory bird include a breeding area within the North American temperate zones and migration, in many cases south of the continental United States during non-breeding seasons (Hunter et al 1993). The total number of species protected by the Migratory Bird Treaty Act (MBTA) as of 2013 is 1,026 birds, of which 40 species are designated to be of concern in the Sierra Nevada Forest Plan (USDA FS, 2004; SNFPA SEIS, Chap. 3, page 172). All bird species analyzed within this document are listed in the General Provision: Revised List of Migratory Birds (2013 Federal Register / Vol. 78, No. 212 pp 65844-65864)

In 2008, the *Memorandum of Understanding between the USDA Forest Service and the US Fish and Wildlife Service to Promote the Conservation of Migratory Birds* was signed. The intent of the MOU is to strengthen migratory bird conservation through enhanced collaboration and cooperation between the Forest Service and the Fish and Wildlife Service as well as other federal, state, tribal and local governments. Within the National Forests, conservation of migratory birds focuses on providing a diversity of habitat conditions at multiple spatial scales and ensuring that bird conservation is addressed when planning for land management activities. Opportunities to promote conservation of migratory birds and their habitats in the project area were considered during development and design of the Rim Fire Recovery Project [Rim Project (MOU Section C: items 1 and 3 and Section D: items 1, 3 and 6)]. The primary focus of the proposed project is for fuels reduction, capturing the economic value of dead burned trees, and abating safety hazards. Other objectives related to wildlife (Chapter 1, Rim FEIS) include retention of some burned forest areas, improvement of mule deer habitat, and establishment of a furbearer corridor.

2. Project

Proposed land management activities are intended to implement direction contained within the Stanislaus National Forest, Forest Plan (USDA 2010) Land and Resource Management Plan (LRMP), as amended (USDA Forest Service, 2010, Stanislaus National Forest, Forest Plan Direction). The Stanislaus National Forest is proposing to manage Forest lands and roads in the area affected by the Rim Fire of 2013 by removing dead and dying hazard trees and to salvage trees within the Rim Fire. This report documents the potential effects of the proposed Rim Fire Recovery Project (Rim Project), on migratory landbirds. The analysis area for this document includes the Rim analysis area (the area of the fire within the Stanislaus National Forest, 154,428 acres) and the Rim Fire (the total fire area, 257,314 acres) as described in the Draft Rim Fire Recovery Project Environmental Impact Statement (Rim DEIS) and supporting documents for the Rim Project.

The description of the proposed project and all alternatives (Alternative 1 – Proposed Action; Alternative 2 – No Action, and Alternatives 3 and 4) are found in Chapter 2 of the Rim FEIS. Descriptions of existing habitat, locations, and the proposed actions relating to wildlife, can also be found in the Biological Evaluation (USDA, 2014a) and the Management Indicator Species Report [MIS Report (USDA, 2014b)] for the Rim Project. This wildlife report tiers to those documents.

The Rim Project is located on the Stanislaus National Forest partially on the Mi-wok and Groveland Ranger Districts. The proposed project excludes all private and Yosemite National Park lands (see Rim FEIS

Location Map), and affects a low of 43,521 acres (Alternative 4) to a high of 45,656 acres (Alternative 3) of land, depending on the action alternative. For a complete description of project alternatives and activities, refer to the Rim FEIS.

The Rim FEIS outlines management requirements that are intended to benefit wildlife species, including migratory landbirds. These management requirements will be discussed in the effects section as they pertain to birds and their habitats. Management requirements benefit birds, but vary, depending on each of the 3 action alternatives. These include limited operating periods within activity centers for northern goshawk, spotted owl, and great gray owl; and retention standards for snags and dead and down woody material, road closures, and protection of wildlife habitats. Management requirements for riparian buffers and federally listed frog and insect species also benefit birds.

3. Migratory Landbird Species of Addressed

The Stanislaus National Forest is listed as a Globally Important Bird Area in the United States (American Bird Conservancy) and Sierran meadows are also listed as a state priority Important Bird Area (Audubon Society). Local birders have documented several uncommon migratory bird species, including regular occurrences of sage sparrow (*Amphispiza belli*) and occasional detections of black-chinned sparrow, black-throated sparrow (*Amphispiza bilineata*), and indigo bunting (*Passerina cyanea*) (Zachman 2012).

MIGRATORY BIRDS OF INTEREST

Risk factors for migratory bird species cannot be described generally, as different species utilize different nesting, and foraging habitats and response to human activity is variable. Also for most species, populations have not been studied, unless a species is classified as threatened, endangered, Forest Service sensitive, or MIS (2004 SNFPA SFEIS p173). Since effects on most migratory birds cannot be described by risk factors, they will be addressed generally by their habitats in this document and used as examples of birds affected by proposed project activities that might be found within the project boundary.

Many species use multiple habitats (such as western bluebird) and may be focal species in various conservation plans (including the Forest Service) and other documents, such as the yearly State of the Birds Assessment (NABC, 2011) and PIF Conservation Plans (2002, 2004). Species within these documents with habitat and probable occupancy that are mentioned here include:

acorn woodpecker (<i>Melanerpes formicivorus</i>)	northern flicker (<i>Colaptes auratus</i>)
hairy woodpecker (<i>Picoides villosus</i> (MIS))	western bluebird (<i>Sialia mexicana</i>)
kestrel (<i>Falco sparverius</i>)	white-headed woodpecker (<i>Picoides albolarvatus</i>)
mountain bluebird (<i>Sialia currucoides</i>)	

Effects to hairy woodpecker habitat are detailed in the Rim Project MIS report

SPECIES OF CONCERN

The Sierra Nevada Forest Plan (USDA 2004) Final Environmental Impact Report (USDA 2004a) identified forty land bird species of concern (SOC) that a high priority for monitoring efforts in the Sierra Nevada Bioregion. These species are also addressed below, where relevant, by habitat and probable occupancy. They include:

black-backed woodpecker (<i>Picoides arcticus</i>)	great gray owl (<i>Strix nebulosa</i>)
black-chinned sparrow (<i>Spizella atrogularis</i>)	Lazuli bunting (<i>Passerina amoena</i>)
blue-gray gnatcatcher (<i>Polioptila caerulea</i>)	Northern goshawk (<i>Accipiter gentilis</i>)
chipping sparrow (<i>Spizella passerine</i>)	sage sparrow (<i>Amphispiza belli</i>)
Cooper's hawk, (<i>Accipiter cooperii</i>)	

The great gray owl and northern goshawk are addressed in detail in the Rim Project BE.

BIRDS OF CONSERVATION CONCERN

The Stanislaus National Forest addresses the U.S. Fish & Wildlife Service 2008 Birds of Conservation Concern (BCC), Bird Conservation Region 15 (Sierra Nevada) (USDI FWS, 2008) for the Sierra Nevada as part of the framework for analyzing effects to migratory birds. This list consists of 11 bird species (Table 1), of which all may nest on the Stanislaus NF and within the project area. Five of the species are listed as species of concern (2004 SNFPA SFEIS, Chap. 3, page 172). Three of the species on the Sierra Nevada bioregional list are also on the Regional Forester's Sensitive Species (FSS) list. The effects to these sensitive species and their habitat are addressed in the Wildlife BE for the Rim Fire Recovery Project.

Criteria used in evaluation of the BCC species listed in Table 1 were based on the likelihood of the species presence in the analysis area, habitat components that would likely be impacted by project activities (snag or hazard tree removal) and whether they are addressed in other documents.

Table 1. Migratory Birds Identified by the US Fish and Wildlife Service for BBC Region 15

Species	Habitat Needs	Addressed In Project Level Report (Ba/Be Or Mis)	*Occurrence Within Project Area
Bald Eagle (S) <i>Haliaeetus leucocephalus</i>	Large trees and snags (nest and roost structure) adjacent to large bodies of water (forage habitat).	Effects addressed in BE.	One nest site within the burn area at Cherry Lake.
Peregrine Falcon <i>Falco peregrinus</i>	Cliff (nest) habitat.	Not addressed.	There are no known nest sites affected; one nest site known in Yosemite.
Flammulated Owl <i>Otus flammeolus</i>	Dense to open stands of mature ponderosa pine, sugar pine and Douglas fir. Also breed in hardwood trees such as oak and aspen as well, provided there is a vacant cavity. forest with brushy understory and snag and tree cavities for nesting and cover.	MIS Report; Mule Deer, Hairy Woodpecker (Oak-associated Hardwood & Hardwood/Snags in Green Forest).	Range indicates a breeding resident; detected on the Forest. Suitable habitat within the project area.
Spotted Owl (<i>occidentalis</i> ssp.) (S)	Dense mixed conifer/fir forests.	BE and MIS report.	Species occurs within the project area.
Black Swift <i>Cypseloides niger</i>	Cliffs adjacent to water.	Not addressed.	Few records of this species on the Forest; breeding status uncertain, species uncommon.
Calliope Hummingbird <i>Stellula calliope</i>	Coniferous Forest/riparian woodland habitat (nesting). Open meadows/shrubs (forage); near water. Mixed-age stand structure, usually early- to mid-successional; typically near forest openings or adjacent to montane shrublands or meadows.	MIS Report; blue grouse (Early and Mid-Seral Forest), yellow warbler (Riparian); and BE, (willow flycatcher).	Species likely occurs seasonally in project area, but rare. Range maps indicate summer breeding.
Lewis's Woodpecker <i>Melanerpes lewis</i>	Open oak savannahs and oak woodlands, broken deciduous and coniferous habitats. Requires open habitats with scattered trees and snags with cavities. Often use burned pine forests.	MIS report; hairy woodpecker (Snags in Green Forest).	Habitat present, but rare.

Species	Habitat Needs	Addressed In Project Level Report (Ba/Be Or Mis)	*Occurrence Within Project Area
Williamson's Sapsucker <i>Sphyrapicus thyroideus</i>	Prefers aspen and lodgepole stands with large snags, sparse to moderate canopy. Uses snags or live trees with rotted heartwood to excavate nesting, roosting cavities. Winters in mixed conifer/hardwood stands.	MIS report; hairy woodpecker (Snags in Green Forest).	Range overlaps project area. Species could occur within project area. There is limited lodgepole and aspen habitat.
Olive-sided Flycatcher <i>Contopus cooperi</i>	Forest habitat immediately adjacent to openings. Prefers large tree (>24" dbh) stands. Positively associated with early post-fire conditions, increasing in relative abundance in burned sites, using standing dead trees as foraging perches in open areas.	Habitat addressed in MIS report: hairy woodpecker (Snags in Green Forest), black-backed woodpecker (Snags in Burned Forest), CA spotted owl/flying squirrel (Late Seral Closed Canopy Coniferous Forest).	Species known to occur in project area and is common.
Willow Flycatcher (S) <i>Empidonax traillii adastus</i> , and <i>E. t. brewsterii</i>	Willow habitat adjacent to slow running water.	Addressed in BE.	One old detection recorded.
Cassin's Finch <i>Carpodacus cassinii</i>	Tall, open, coniferous forest adjacent to open meadows or wetlands.	Habitat partially addressed in BE and MIS report; CA spotted owl/flying squirrel (Late Seral Closed Canopy Coniferous Forest).	Known to occur on Forest. Uncommon to common; breeding status uncertain.

*Range/Breeding status from NatureServe. 2014. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://explorer.natureserve.org>. (Accessed: February 26, 2014). Detections from district and other local area sources.

The bald eagle (FSS), California spotted owl (FSS, MIS), and willow flycatcher (FSS) are addressed in detail in the Rim Project BE.

Peregrine Falcon: Nesting habitat for the peregrine falcon is on rock cliff sites on the Forest, of which one is located within the Rim fire boundary within the Yosemite National Park. Activities would not affect steep rock cliff sites in the project area or in Yosemite National Park, and are not within ½ mile of the known nesting site. This species will not be addressed further.

Black Swift: The black swift is a rare spring and fall migrant across the Forest but has not been confirmed as a resident. Suitable wet cliff/waterfall habitat does occur in some areas, but these areas would not receive ground disturbing activities that would modify or alter habitat values for the species. This species will not be addressed further.

3. Existing Conditions

Burned habitat ranges from slightly burned with a slight tree mortality (less than 10 percent) to completely burned, with all trees killed. Modeled post-fire vegetation was created after the Rim Fire (see MIS Report, Appendix A for methodology an explanation of percent basal area mortality, based on fire severity) in the Geographical Information System mapping program (GIS). See the Rim FEIS for acres of unburned to high severity fire. 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. The data was derived from Landsat Thematic Mapper imagery, or alternative satellite imagery, when Landsat was not available. Table 2 shows the habitat post-fire within the analysis area (as defined in the BE for the Rim Project) and cumulative effects area (Rim Fire perimeter), based upon this information.

Table 2. Post-fire habitat acres in the Rim Project Analysis area and Rim Fire

Habitat*	Post-Fire, Analysis Area	Post-Fire Rim Fire Total
Barren	806	1,864
Wet Habitats (lacustrine, riverine)	145	548
Wet Meadow	39	577
Grassland (annual and perennial)	11,724	19,923
Shrubland (MCP,MCH, CRC)	53,189	80,721
Montane Riparian – black cottonwood, white alder, bigleaf maple	6	191
Oak-associated Hardwood (BOW, BOP, MHW)	24,426	33,900
Mixed oak/conifer MHC**	12,141	14,813
Early Seral Coniferous Forest (all conifers all densities)	6,574	9,767
Mid/late Seral open Coniferous Forest (all conifers, densities less than 45% canopy cover)	5,326	14,725
Mid -Late Seral closed Canopy Coniferous Forest (all conifers, densities greater than 45% canopy cover)	36,051	69,897
Snags in Green Forest (all tree types, , medium to large snags)	50,506	96,755
Snags in Burned Forest (all conifers, size class 3-5)	44,506	71,425

*Habitat classification based on California Wildlife Relationships System (CWHR)

Oak woodland: BOW = blue oak woodland BOP = blue oak/foothill pine MHW; mountain hardwood (oak) MHC = Ponderosa Pine, Incense Cedar, California Black Oak; hardwoods assume stump sprout so habitat acres don't change

Shrub: MCP = Ceanothus Species, Manzanita Species, Bitter Cherry MCH = Scrub Oak, Ceanothus Species, Manzanita Species

CRC = Chamise-Redshank Chaparral; post fire shrub here includes burned snag forest.

Terrestrial species dependent on shrub and herb understories for food and cover benefit from increased diversity of understories formed in the years following fire, although species associated with woody debris may decrease in the short term until new snags and down wood are recruited (Pilliod et al. 2006). This occurs when live fire-weakened trees that remain unharvested begin to die and fall. Oaks and riparian hardwoods are expected to resprout, but would not contain the values such as acorn production, structural complexity, or decay for many decades.

Stand replacing fire within predominantly Sierra Mixed Conifer forest and other types resulted in a large increase (from 27,000 acres to 53,189 acres) of early seral shrub habitat conditions throughout the analysis area that would benefit species such as the Lazuli bunting. While the calliope hummingbird utilizes green forest components such as understory vegetation, it will also use post-fire shrub habitat, once it is a few years old, for foraging. This is true for several birds, such as kestrels, western bluebird and mountain bluebirds, secondary cavity nesters that use already excavated snags for nesting purposes and the surrounding area for foraging.

Many birds tolerate or capitalize on the ecological changes resulting from moderate burns, where about 50 percent of the trees are killed, to severe fire (Hutto 1995;Kotliar et al, 2007, Bond et al., 2012), where all trees and vegetation are killed. Fires create forest structures and ecological elements and processes that cannot be readily created by management actions (Hutto 1995, Kotliar 2002). Smucker (2005) reports that 12 bird species were significantly more abundant after fire and seven species were significantly less abundant after fire at one or more fire severities, and that at least 4 additional species were likely to have responded positively to at least one level of severity. Arboreal species, associated with closed forest canopies decline following crown fires, and species associated with open forest conditions and snags increase (Hutto 1995, Pilliod et al. 2006). Overall bird species richness is similar but the suite of birds using the habitat changes.

There are 44,000 acres of post-fire snag forest existing post-fire that are suitable for species such as the olive-sided flycatcher, Lewis's woodpecker, and black-backed woodpecker. These species have been associated with early post-fire conditions, increasing in relative abundance in burned sites (Smucker et al, 2005), especially in regards to using standing dead trees as foraging perches in open areas (Hutto, 1995) and using edges of mature live trees and open burned forest (Kotliar et al., 2002).

The Rim Fire resulted in an overall decrease in habitat suitability for those species that are dependent on green forest components, such as the calliope hummingbird, Cassin's finch; and hawks; such as the northern goshawk and Cooper's hawk, all of which nest in branches or understory vegetation (trees or shrubs). Another species with less habitat acres is the Williamson's sapsucker, which prefers living trees with rotten heartwood for nesting.

4. Effects on Migratory Landbirds

Table 3 shows the habitat that is affected in each alternative. Effects on habitat were determined by modelling project activities over the post-fire habitat types in GIS layers.

Table 3. Acres of Habitat potentially affected by Rim Fire Project Action Alternatives

Habitat*	Alternative 1	Alternative 3	Alternative 4
Shrubland (MCP, MCH, CRC) (less than 25% burned)	3,853	4,866	4,808
Oak-associated Hardwood (BOW, BOP, MHW, MHC)	5,645	6,222	6,115
Early Seral Coniferous Forest (all conifers all densities)	1,760	1,742	1,824
Mid/late Seral open Coniferous Forest (all conifers, densities less than 45% canopy cover)	2,374	2,312	2,178
Mid-Late Seral closed Canopy Coniferous Forest (all conifers, densities greater than 45% canopy cover)	9,920	9,874	9,535
Snags in Green Forest (all tree types, medium to large snags)	13,834	13,702	13,223
Snags in Burned Forest (all conifers and hardwoods, size class 3-5)	3,276	3,178	3,014

Project activities would not enter or occur within wetlands, meadows, lacustrine, or riverine habitats so migratory landbird species associated with these habitat types (willow flycatcher; Cassin's finch) would be unaffected by proposed project activities in any alternative. Riparian habitat (aspen, cottonwood, alder, willow, dogwood, etc.) would not be removed. Riparian habitats within the project area were identified and buffers established, as part of the management requirements.

EFFECTS OF ACTION ALTERNATIVES

Management for migratory birds is generally accomplished by providing a diversity of habitat conditions at appropriate levels. All action alternatives result in similar desired conditions for fuels levels across the project area and have similar acres (4 percent difference between the high and low acre action alternatives); hence they have similar effects on migratory birds for habitat types.

The Rim Project action alternatives 1, 3 and 4 could result in direct and indirect effects to migratory landbirds through the following activities:

- Salvage harvest of fire-killed tree across landscape and along roadsides, salvage of live hazard trees.
- New permanent road construction, temporary road construction, and road reconstruction, landing construction and use.

- Biomass fuels treatments.

These actions may have direct and indirect effects on migratory birds causing:

- Project related death, injury, or disturbance to adults or young.
- Project related modifications to habitat quantity and/or quality

Shrubland – Based on modelling of project activities over the post-fire habitat types in GIS, 7 percent of the remaining lightly burned to unburned shrubland communities would be minimally impacted by the incidental removal of shrubs during harvesting and road/landing construction/reconstruction/ activities. Species associated with this habitat include the black-chinned sparrow, fox sparrow, calliope hummingbird, and sage sparrow (this species occasionally uses chaparral for nesting and foraging). Removal of hazard trees along roadsides would open a 200 foot strip of land that would be suitable for the incursion of shrub habitat. Overall this habitat type would remain and resprout if damaged or crushed during all project activities. Species, such as the calliope hummingbird utilize older burned areas, probably because shrub food resources are present and shrubs would not be affected overall by snag removal. While adults and fledglings can escape direct impacts, nest sites are vulnerable to abandonment and direct harm to eggs and chicks.

Oak Habitat – Salvage harvest would not occur in oak habitat. This habitat type is represented by the acorn woodpecker, Lewis's woodpecker, blue-gray gnatcatcher, and western bluebird. The flammulated owl will nest in this habitat type also, and will consume acorns in the winter. As with shrubland communities, a small amount of habitat for all alternatives is within units, planned road work footprint, or alongside roads (about 10% for all alternatives), so there would be a limited amount of disturbance associated with harvest and road construction activities, and some snags might be taken during roadside hazard tree treatments. Effects are similar to those in shrubland. All oak snags over 12 inches would remain in units.

Green Forest – Early to late-seral forest habitat (see Table 3 for amounts) size, density and type would not be affected by proposed project activities so species such as northern goshawk, Williamson's sapsucker (which excavates and feeds primarily in live trees), Cassin's finch and chipping sparrow would not be affected by overall habitat loss. The amount of understory vegetation that some of these species utilize for feeding or nesting cannot be quantified, as some understory vegetation in green forest areas that would be subject to snag removal may be more or less burned, depending on fire severity and the current vegetation classification (CWHR) scheme does not account for it. However, it can be assumed that most remains in areas that are less than 25 percent burned.

Understory shrub and hardwood habitat in remaining green forest that is used for foraging could be damaged or removed during project activities, as snags are removed for their merchantable value and down wood could be crushed during project activities. In spring, nests located in green forest could be abandoned because of project activity noise levels, or nests in remaining understory layers could be destroyed, especially during hazard tree removal activities that are ongoing over a five year period. William's sapsucker trees, which often have rotten heartwood, could be targeted as hazard trees if located within 200 feet of roads.

The northern goshawk, California spotted owl, and great gray owl are all sensitive migratory birds that live in late-successional forests, have Protected Activity Centers (PACs) and have limited operating periods during the breeding season, which would reduce disturbance to other migratory bird species nesting in densely forested areas and forest edges. No activities, including those associated with research efforts occur within remapped PACs except alongside roads, where hazard tree removal occurs. Acres of hazard tree removal were compensated for by adding acres to the PACs that are away from roadsides, benefiting migratory birds.

Snag retention requirements of at least 4 snags per acre greater than 15 inches in diameter and woody debris retention at 10-20 tons per acre for all alternatives, if available in larger size classes, would provide habitat structure important for bird species nesting, roosting and foraging requirements. Retained snags are expected to contribute and provide suitable habitat, although of lower quality in the short term, and in the long term as

large downed woody debris and structure important in a recovering forest. In most areas, there is a lack of sufficient large downed woody material, making snag retention and eventual recruitment as downed logs even more critical. Biomass treatments that result in the removal of smaller downed woody material may result in a more diverse understory including more herbaceous and shrub vegetation (*from Rim Project BE/BA; see this document for a more complete discussion of this habitat element*).

Cavity Nesters in Green and Burned Forest

While individual birds or nests may be affected during the process of project implementation in action areas, for most habitats as described above the species that are most likely to be impacted are cavity nesters. In all cases the primary habitat component needed for breeding or foraging is snags. This habitat occurs throughout the Rim Fire area, and is the habitat most likely to be salvaged for burned dead trees or have snags and live trees removed in hazard tree operations. Cavity nesters include species such as the black-backed woodpecker, hairy woodpecker, white-headed woodpecker, Lewis's woodpecker, Williamson's sapsucker, northern flickers, flammulated owl, mountain bluebirds, and olive-sided flycatcher. All cavity nesters utilize both green and burned forest habitats, although species such as mountain bluebirds, northern flickers, olive-sided flycatchers and some woodpeckers (e.g. black-backed woodpecker and hairy woodpecker) have a strong preference for burned forest, if available.

All cavity nesters respond primarily to the changes in structural characteristics (snag density and size, decrease in canopy cover, changes in insect prey) brought about by fires (Kotliar et al 2002, 2007). Some species that have a preference for nest sites with up to 80 snags per acre and a medium to large diameter have been documented in several studies of cavity-nesting birds in both unburned and burned forests (Saab et al. 2009; Burnett et al., 2012). Species composition varies, depending on whether or not a fire was salvaged in the early years after the fire (Saab et al., 2007 and 2009; Hutto and Gallo, 2006). Primary cavity nesting species, such as hairy woodpecker, black-backed woodpecker, white-headed woodpecker and northern flickers use high snag areas (80+ snags per acre) (Burnett et al., 2012, Saab et al., 2009). Many of these species do not use extensively salvaged burns (defined by Kotliar et al 2002, as clearcut, or removal of most medium and large snags), as snag abundance is a limiting factor for occupancy. The Rim Project would have the highest effect on these species habitats, as snags are used for both breeding and foraging.

Some species are not as dependent on snag density, as they are to the structural aspects of the snag. Some secondary cavity nesters such as kestrels and western bluebirds preferred lower quantities of snags and open terrain (Saab, 2009). Lewis's woodpecker was found in logged areas with a lower snag density, reflecting its preference for more open habitats in green forest. Species such as Williamson's sapsucker that require living trees for foraging, prefer them as nest sites (although they will use dead snags for nesting if populations are high), and prefer lodgepole and aspen stands (Sousa, 1983). These species would be less impacted by salvage activities, as would species such as olive sided flycatcher (which prefers edge habitat), and the northern flicker that persist in partially salvaged burns. Although maintaining clumps of large snags in post-fire landscapes were found to be necessary for maintaining breeding habitat of some cavity-nesting birds, such as the black-backed woodpecker (Saab et. al 2009), appropriately managed salvage can create habitat for many species of cavity-nesting birds that prefer more open environments (Burnett, et al., 2012, Saab, 2009).

All alternatives would remove over 50 percent of burned forest habitat. Effects would be partially mitigated through snag retention requirements for each alternative (see below), and the retention of some unsalvaged burned areas where large densities of medium to large snags remain unharvested. These unsalvaged areas vary in size and location, depending upon the alternative, with Alternative 4 having the most severely burned continuous forest acres remaining. Snag retention guidelines for all alternatives would primarily benefit those species that prefer low densities of snags. There are numerous oak snags in the project area and these would generally be retained, maintaining this important habitat type for cavity-nesting bird species.

The alternatives would affect between 13,834 (Alternative 1) to 13,223 (Alternative 4) of 50,857 acres of snags in green forest habitat, through the removal of burned trees in green forest, where cavity nesters, such as flammulated owls, Williamson's sapsuckers, and hairy woodpeckers utilize snags in green forest.

There would be several different densities on the landscape after the proposed project treatments that would benefit a variety of snag dependent species. Burned habitat with medium to large snags would remain scattered in clumps on approximately 37 percent of the burned area within the Rim Project area, providing some amount of burned forest habitat in a diverse array of low, moderate, and high severity burn conditions. Over 80 percent of green forest with snags would remain unsalvaged. Leaving portions of unharvested snags can result in no net loss in the diversity of cavity nesting species (Kotliar 2002).

Alternative 4 would retain the most burned snags and snags in green forest habitat containing medium to large snags in high densities, and provides the most quality habitat for cavity nesters in burned forest (see MIS and BE/BA reports for the Rim Project). The action alternatives would leave the following snags per acre on the landscape: Alternative 1 – 4 snags per acre; Alternative 3 - 11 snags per acre on average; and Alternative 4 – 12 snags per acre, on average; all snags greater than 15 inches in diameter.

Birds breeding in the project area utilize a range of habitat types varying from chaparral, oak woodland and mixed conifer of various seral stages, as well as snag dominated habitat. These habitat types are distributed throughout the post-fire environment within the project area. The action alternatives effects would be limited primarily to one element (snags) within the mixed conifer.

For all action alternatives, other direct effects on cavity nesters and forest birds includes short term disturbance during project operations (i.e. mastication, hand-cutting with chainsaws, and prescribed burning activities). Tree falling and removal and pile burning could result in disturbance to birds during the nesting season (February to August), potentially causing abandonment of nests or mortality to eggs and chicks as snags and hazard trees within green and burned forest are felled. Adults and fledged birds in the treatment areas would likely avoid harm since they can fly to other nearby cover for refuge. These potential effects are considered to be short term and will only affect treated areas. Snags will be retained in treated areas to provide cavity and foraging substrates in the vicinity of treated areas. Snags would be retained within treated areas to provide cavity and foraging substrates. The amount of area left untreated varies by Alternative, however all alternatives include untreated forest with burn severities ranging from unburned to high severity distributed throughout the project area which will provide habitat for cavity nesting species. Some treated areas will likely be restored in the future, providing long-term forested habitat for a variety of species, including migratory birds. The potential short term losses are outweighed by long term habitat benefits from reduction of fuel loads and undesired fire effects.

Indirect effects include the temporary loss of vegetation cover and some habitat alteration which would affect opportunities for nesting, shelter, and foraging. Secondary cavity-nesting birds, such as mountain bluebird would reuse a smaller number of older cavities, which could also affect their nest success in salvage-logged forests, as a result of competition and predation (Hutto and Gallo 2006). Bird species that utilize dead trees for some habitat use, such as perches for territorial singing, hawking/foraging, and nesting (Cooper's hawk, olive sided flycatcher), would have a potential decline in habitat suitability on both green and burned acres treated for dead tree removal. This would be mitigated by snag retention requirements as outlined above.

The project would result in more open areas around salvage units that would have sharper edges. There would be no large snags along roadsides, resulting in a lack of sites for cavity nesters that utilize green forest snags. Unit and road edges would be sharper, which means birds may be more susceptible to brood parasitism, as cowbirds prefer areas with open edges (Cain et al., 2003; Germaine and Germaine, 2002), and there are range allotments and meadows within and adjacent to the proposed action areas.

Disturbance would be temporary, although once salvage and hazard trees are removed, it will allow opening more of the Rim Fire to human uses and associated disturbance, since the project area roads contain access roads. This higher human use can include illegal off-road activities. Uses include recreation, other green forest management projects scheduled within project boundaries such as the Rim Hazard Tree Project, and likely reforestation activities after the project is completed.

EFFECTS OF ALTERNATIVE 2 – NO ACTION

In Alternative 2, there would be no removal of fire-killed or roadside hazard trees, and no decline from the existing condition in habitat suitability for migratory landbirds. The average snag density (greater than 15 inches in diameter) remaining across the analysis area would remain the same. Over time, unless the area is replanted, shrub habitat would remain on the landscape indefinitely, attracting varied suites of birds as shrub habitat matures. The area would remain susceptible to high severity fire because of high fuel loading across the landscape.

CUMULATIVE EFFECTS

There are over 50,000 acres of burned forest habitat and 95,000 acres of coniferous forest with medium to large snag habitat remaining within the Rim Fire cumulative effects area, post-fire, including the national park and private lands. The alternatives in combination with all other present and foreseeable actions (other Forest Service, National Park, and private actions) would reduce 46 to 51 percent of suitable cavity nesting burned habitat and reduce the suitability of 20 percent of green forest habitat, depending on the action alternative. There would be 25,236 acres of burned forest and over 67,000 acres of snags in green forest remaining that are unaffected by any project activity, suitable for cavity nesters that utilize green forest, but also have a preference for burned forest. Much of the suitable burned snag habitat remains in Yosemite National Park, especially at the higher elevations, as the park is planning on limited hazard tree removal along roadsides.

For cumulative effects to species that are dependent on snags in burned forest, see the analysis of the black-backed woodpecker in the MIS and BE reports for the Rim Project. For a complete cumulative analysis of snags in green forest (Hairy Woodpecker) and late-successional habitat (California spotted owl and others), see the MIS report.

Salvaged areas would recover with natural regeneration of shrubs, grasses, forbs and/or trees depending on local seed sources and presence of root sprouting species and would provide extensive habitat over the long-term to species that are dependent on specific characteristics of shrub habitat (dead trees for insect populations, roosting, and perching; dead and downed logs and other woody material; etc.). Without planting, shrub dominated habitats would persist for an indefinite time.

Other activities on the Forest within the project perimeter are considered with respect to the effects on wildlife species and would incorporate measures, as needed, to reduce or prevent adverse effects. Because the Forest Plan includes a number of measures intended to protect wildlife and maintain important habitat characteristics, and because the anticipated effects of the project would be limited, project implementation is not expected to contribute to cumulative adverse effects to migratory birds, while providing the anticipated beneficial effects described above.

Overall, the proposed action for the Rim Fire Recovery Project is not expected to have more than temporary disturbance-related effects to individual birds. The project would reduce green forest snag/burned forest habitat, but a substantial amount would remain throughout the Rim Fire landscape, providing corridors for movement and dispersal

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