

Biological Evaluation

For

Bald Fire Salvage and Restoration Treatment Project Lassen National Forest

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Submitted:

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I. INTRODUCTION

Purpose of This Biological Evaluation

The proposed activities considered in the Environmental Assessment (EA) for the Bald Fire Salvage and Restoration Project (hereinafter Bald Project) on the Hat Creek Ranger District require a Biological Evaluation (BE) to be completed (FSM 2672.4). The BE process (FSM 2672.43) is intended to conduct an analysis and document activities necessary to ensure proposed management actions will not likely jeopardize the continued existence or cause adverse modification of habitat for Federally listed species, or for species listed as Sensitive by Region 5 of the USDA Forest Service.

This BE is prepared in accordance with the Endangered Species Act of 1973, as amended, and follows standards established in Forest Service Manual Direction (FSM 2671.2 and 2672.42) for Threatened, Endangered and Sensitive (TES) wildlife species. The purpose of this BE is to assess potential effects of the proposed activities of the above mentioned EA. Species to be considered in this document were determined based on review of the U.S. Fish and Wildlife Service website (http://ecos.fws.gov/tess_public/; accessed on 19 March, 2015), and on review of the USDA Forest Service Sensitive species list for Region 5. Table 1 displays the TES species considered and their federal status, whether or not the species is known or expected to occur in the project area, whether the project has suitable habitat, and if the species needs further analysis in the document before a determination of effects is made by the biologist.

Review of Threatened, Endangered or Sensitive Species for the Bald Project

Table 1 - List of TES terrestrial wildlife species on the Lassen National Forest, and the status of each within the Bald Project area.

| Species name | TES status | Species detected w/in or adjacent to project area? | Suitable habitat within or adjacent to project area? | Species addressed in further detail in this document? |
|---|------------|--|--|---|
| Gray wolf (<i>Canus lupus</i>) | FE | No | Not occupied | No, the species is not known or expected to occupy the project area. |
| Northern spotted owl (<i>Strix occidentalis caurina</i>) | FT | N/A | N/A | No, occurs more than 10 miles North of the project area. The species is not known or expected to occupy the project area. |
| Valley elderberry longhorn beetle (<i>Desmocerus californicus dimorphus</i>) | FT | N/A | N/A | No, project is outside range of species |
| Northern bald eagle (<i>Haliaeetus leucocephalus</i>) | FSS | No | No | No, due to lack of suitable fish or waterfowl producing areas within area |
| Great gray owl (<i>Strix nebulosa</i>) | FSS | No | No | No, lack of suitable meadow sites for foraging. Forest suitable habitat was previously surveyed. Not |

| Species name | TES status | Species detected w/in or adjacent to project area? | Suitable habitat within or adjacent to project area? | Species addressed in further detail in this document? |
|---|------------|--|--|--|
| | | | | known or expected in the project area. |
| Willow flycatcher (<i>Empidonax traillii</i>) | FSS | No | No | No, lack of suitable habitat. |
| California spotted owl (<i>Strix occidentalis occidentalis</i>) | FSS | No | No | No, The project area does not contain any spotted owl habitat or Protected Activity Centers (PACs). Habitat analysis previously done for Bald Fire Rapid Assessment shows eastside forest type with no suitable habitat present. |
| Northern goshawk (<i>Accipiter gentilis</i>) | FSS | Yes | Yes | Yes. Protected Activity Centers have been previously identified within the project boundary prior to occurrence of the fire. |
| Greater sandhill crane (<i>Grus canadensis tabida</i>) | FSS | No | No | No, lack of suitable wetlands. Species not known or expected in project area. |
| Yellow rail (<i>Coturnicops noveboracensis</i>) | FSS | No | No | No, due to lack of suitable large wet meadows or marshes |
| Sierra Nevada red fox (<i>Vulpes vulpes necator</i>) | FSS | No | No | No, lack of suitable habitat which is in higher elevation areas. Species not known or expected in project area. |
| Pacific fisher (<i>Pekania pennanti</i>) | FSS; P | No | No | No, lack of suitable habitat. Species not known or expected in project area. |
| American marten (<i>Martes americana</i>) | FSS | No | No | No, lack of suitable habitat. Species not known or expected in project area. |
| California wolverine (<i>Gulo gulo luteus</i>) | FSS | No | No | No, lack of remote, high elevation habitat. Species not known or expected in project area. |
| Pallid bat (<i>Antrozous pallidus</i>) | FSS | Likely | Yes | Yes |
| Townsend's big-eared bat (<i>Corynorhinus townsendii</i>) | FSS | No | No | No, due to lack of roost habitat in or near project area. |
| Fringed myotis (<i>Myotis thysanodes</i>) | FSS | Likely | Yes | Yes |
| Western bumble bee (<i>Bombus occidentalis</i>) | FSS | Likely | Yes | Yes |
| Shasta Hesperian snail (<i>Vespericola shasta</i>) | FSS | No | No | No, the project is outside the range of this species, endemic to the Shasta region. |
| Northwestern pond turtle (<i>Clemmys marmorata marmorata</i>) | FSS | No | No | No, the project is outside the geographic range of this species |

Source: USFWS web site, accessed 28 October, 2014 and USFS Region 5 Sensitive Species list

Symbols used: FT = Federally listed as Threatened; FE = Federally listed as Endangered

P = Proposed for Federal Listing

FSS = Forest Service Sensitive

N/A = Not applicable, outside range of species

Based on the findings in Table 1 above reviewing TES species pertinent to the Bald Project, the following USFS Sensitive species will be addressed in further detail in this section of the document: northern goshawk, pallid bat, fringed myotis, and western bumble bee. The remaining species are dismissed from further detailed analysis and will not be affected by the project proposal.

Additional Narrative of TES Species Dismissed from Further Analysis

One transient gray wolf, designated OR-7, traveled from Oregon to northern California in December, 2011. This individual wolf traveled extensively in northeastern California, including in and across the Lassen NF. OR-7 has since established a den site in southern Oregon. Due to the absence of the individual and the species, there would be no effects from the Bald Project on gray wolves.

No bald eagle nests are located within the project area, and no water bodies of sufficient size or productivity exist that would support a bald eagle nest territory. Similarly, there are no meadows of sufficient size, marshes or riparian areas that would provide suitable habitat for great gray owls, willow flycatchers, greater sandhill cranes or yellow rails within the analysis area. Therefore, there should be no effects to these species or their habitat.

No caves or cave analogs exist within or near the project boundaries, and Townsend's big-eared bats have not been detected near or within the project boundaries, therefore the Bald Project should have no effect on Townsend's big-eared bats.

The Lassen NF's LRMP established a network of fisher and marten habitat management areas (HMAs) and connecting corridors that stretch north to south across the Forest. The Bald Project does not contain any of these HMAs, because the area is predominately eastside pine which does not support fisher or marten. In 2010, 2011 and 2012 Pacific fisher (proposed for Federal listing as Threatened in 2014) were detected during camera surveys within the Green Mountain/Snow Mountain area of the Lassen NF. This is an isolated parcel of USFS lands, about 7,700 acres in size, located to the west of Burney Mountain. This parcel is about 3 miles west of the Lassen NF boundaries, separated from it by private timberlands. Another fisher was detected by a camera in 2009 in Malinda Gulch, on the north side of the Pit River. Fishers were not detected during camera surveys conducted post-fire around the perimeter of the nearby Eiler fire in the fall and early winter of 2014. Members of a population of introduced fisher, located on private timber lands near the west side of the Lassen NF, are not known to have entered the Hat Creek Ranger District or the project area. Therefore, while fishers have been detected southwest of the fire, there is no evidence of the species occurring within or adjacent to the fire perimeter.

Modeled marten habitat on the Lassen NF (Rustigian-Romsos and Spencer 2010) indicates that the largest area of high probability marten habitat nearby occurs in the central and SW portions of the Thousand Lakes Wilderness in the area of the 8,000-plus foot peaks (Crater, Magee, and Fredonyer), with habitat quality decreasing with distance and elevation loss from these peaks. High probability marten habitat begins to subside at the edge of the nearby Eiler Fire perimeter within the Wilderness, and ceases at the USFS-private boundary north of the wilderness. Another smaller, isolated area of high probability marten habitat was modeled on Burney Mountain. No fisher or marten have been detected during past camera surveys in the area and neither species is expected to occur in the Bald Project Area (K. Harville, personal communication 2015).

No Sierra Nevada red foxes have been detected by past USFS survey efforts within or near the Bald Fire perimeter. During the fall and early winter of 2014, 10 camera locations were operated for approximately 1 month at locations around the perimeter of the nearby Eiler fire in unburned forests, and at the edge of the Thousand Lakes Wilderness. No red foxes were photographed during this survey effort. Past survey efforts by the State Department of Fish and Wildlife also did not detect red foxes within the Thousand Lakes Wilderness or on Burney Mountain. The most likely area of red fox presence, despite the lack of detections, would be within the Thousand Lakes Wilderness or in the adjacent Inventoried Roadless Area which is well removed from the Bald Fire project area.

The wolverine was proposed for Federal listing in February, 2013 (USFWS 2013); the USFWS withdrew this proposal in 2014. The Bald Project landscape does not provide remote, high elevation, tree-line habitat preferred by wolverine (Grinnell 1933, Grinnell et al 1937, USDA 2001 Chpt. 3, p. 45) or areas of deep snowpack (Brodie and Post 2010), and no wolverine have been detected during camera survey efforts on the Lassen NF. There would be no effect to wolverine or their habitat since the species is not known or expected to be present in the project area.

Current Management Direction

Management direction for USFS Sensitive species is provided by a variety of sources including the Forest Service Manual and Handbook (2670) and the 1993 Lassen NF Land and Resource Management Plan (LRMP), as amended. The LRMP provides standards and guidelines for Sensitive species which have been modified by several Forest Plan amendments, including the Sierra Nevada Forest Plan Amendment (SNFPA) FEIS and ROD (2001), and the SNFPA FSEIS and ROD (2004). Management direction specific to some Sensitive species, such as pallid bat, does not exist. However, direction exists to manage habitat for Sensitive species to ensure that these species do not become Federally listed as Threatened or Endangered due to Forest Service

actions (FSM 2672.1). There is also direction for all native and desirable non-native vertebrate species to provide for diverse and viable populations (FSM 2670.22).

II. DESCRIPTION OF THE PROPOSED ACTION AND EACH ALTERNATIVE

The purpose of the Bald Project is to immediately reduce numerous safety hazards caused by the Bald Fire, capture the limited remaining forest product economic value, reduce fuel loads, adequately prepare sites for forest regeneration, reduce fuel loadings that create conditions prime for devastating re-burns, and quickly reforest suitable portions of the landscape deforested by the Bald Fire before these sites become fully occupied by competing vegetation. Reforestation would expedite the beneficial re-establishment of a forested landscape capable of producing a variety of wood products, wildlife habitat, and ecological services.

Alternative 1 – Proposed Action

To respond to the purpose and need, the Responsible Official has proposed hazard tree removal (along approximately 131 miles of NFS roads (maintenance level (ML) 2 and higher), and approximately 10 miles of the Burlington Northern Santa Fe railway), salvage harvest (approximately 3,632 acres), fuels treatments outside of salvage units (approximately 5,499 acres), and tree planting (approximately 12,226 acres) in specified treatment areas. Some areas would receive various combinations of treatments. The total footprint of treatments on national forest lands under the proposed action would be approximately 46% (14,363 acres) of the project area. While no new permanent road construction is proposed, temporary roads would be constructed for implementation, and then decommissioned. Existing roads would be repaired and maintained to facilitate the removal of salvage material, fuels treatments, and reforestation activities.

Table 2 - Summary of Activities in Alternative 1 - Proposed Action

| Alternative 1 | Estimated Acres | Percent of Project Area |
|-------------------------------------|------------------------|--------------------------------|
| Hazard Tree Removal | 4,815 | 15% |
| Area Salvage | 3,632 | 12% |
| Area Fuels | 5,499 | 18% |
| Reforestation Only | 417 | 1% |
| Total proposed for treatment | 14,363 | 46% |
| Natural Recovery | 16,961 | 54% |

Hazard Tree Removal

Hazard trees within approximately 150 feet along maintenance level (ML) 2 or higher roads within the fire-affected² area would be felled and removed. Hazardous trees along the Burlington Northern Santa Fe railroad easement would also be felled. Depending on access, these trees would be removed or left in place. Sub-merchantable trees and non-merchantable hazard trees would be felled and left in place, or piled and the piles burned, depending upon the amount of surface fuel loading present.

Area Salvage Harvesting

Fire-killed and fire-injured trees within the Bald Fire perimeter would be harvested. Merchantable trees would be removed as sawlogs if operations occur before the wood deteriorates. Non-merchantable trees would be removed as biomass, masticated, felled and lopped, machine piled and burned or broadcast burned to meet desired fuel conditions.

Area Fuel Treatments

In areas that burned at moderate and high severity and where timber does not meet merchantability standards, hazard abatement, fuels reduction, and site preparation for reforestation would be accomplished by biomass removal, mastication, felling and lopping, machine piling and burning, or broadcast burning.

Reforestation

Prior to planting, concentrations of activity-generated fuels and sub-merchantable trees would be removed to facilitate reforestation, help protect planted trees once they become established, and reduce the risk of a possible re-burn. Site preparation would include a variety of treatment methods that include machine or hand cutting and piling followed by pile burning, mastication of fire killed shrub stems or broadcast burning fire-killed trees. In addition, sprouting shrubs and vegetation may need to be treated adjacent to planted trees to reduce competition for site resources in order to assure establishment. This may be done through manual or mechanical cutting methods such as grubbing, mastication, or use of brush cutters. Ripping may be done prior to planting. Reforestation would need to occur within two years to increase the probability of survival of the planted trees with the competing brush.

Alternative 2 – No Action

Under the No Action alternative, none of the activities proposed under Alternative 1 would be implemented. The No Action alternative would not preclude activities previously approved in this area or activities planned as separate projects. No fuels treatments, site preparation, or

² In addition to roads, and the railway within the fire perimeter; incidental hazards along the perimeter roads would be treated

reforestation would occur. Current management practices such as road maintenance and fire suppression would continue.

Hazard tree felling **could** occur along roads currently open to the public as part of road maintenance as per LRMP direction. These hazard trees would be felled and left in place to protect public safety.

Alternative 3 – Road Hazard Only

To respond to concerns raised during public scoping, the Responsible Official has proposed limiting treatment to hazard tree removal (along approximately 129 miles of NFS roads and approximately 10 miles of the Burlington Northern Santa Fe railway). Commercial sized hazards would be felled and removed along ML2 and higher roads. Sub-merchantable hazards would be felled and left in place or piled and burned. No other site preparation or reforestation would occur along these roads. No other management activities (besides those previously authorized) would occur. The total footprint of treatments on national forest lands under Alternative 3 would be approximately 15% (4,736 acres). Existing roads used under this alternative would be repaired and maintained.

Additional Considerations Applied to the Action Alternatives

- Large and medium patches of existing burned forest habitat interspersed throughout the burned area would be left untreated under the proposed action to allow for natural recovery (54% of the project area).
- To provide for snags and down woody debris across the treatment areas, retention islands would be designated in all treatment units except road hazard removal units. Retention islands would consist of small-untreated patches within the boundary of treatment units that range in size commonly between two to five acres, and would comprise 20 percent of the acres within each unit. Retention islands would be distributed across the unit to provide a variety of burned conditions representative of those present in the unit prior to treatment.
- Integrated Design Features (IDFs) will be incorporated as part of the Action Alternatives for the project. They are implementation parameters that would be incorporated into treatments, contracts, or used to guide Forest Service personnel in conducting implementation. The IDFs are described more fully in the Environmental Assessment and would be implemented in addition to standards and guidelines from the Forest Plan, and California Best Management Practices (BMP) regarding Water Quality Management.

III. EXISTING ENVIRONMENT

Based on the previous table and narrative reviewing TES species pertinent to the Bald Project, the following USFS Sensitive species will be addressed in further detail in this section of the document: northern goshawk, pallid bat, fringed myotis, and western bumble bee.

The following table shows the approximate pre-fire and post-fire cover types on USFS lands within the burn perimeter. Small changes may occur in the data as new information comes available; however small changes of differences in these numbers are not expected to affect the trends or conclusions in the wildlife analysis. The primary change in the landscape because of the fire is that approximately 52% of the Eastside Pine vegetative cover was burned in the fire and a substantial portion of that has become burned snag habitat. As a result, those wildlife species that depend on varying levels of green tree forested cover, eastside pine types in particular, have already seen a dramatic reduction in available habitat because of the 2014 fire.

Table 3 - Cover types in the project area before and after the Bald Fire.

| USFS Cover Type | Pre-fire Acres | Post-fire Acres | Pre-fire % Cover | Post-fire % Cover | Change in Cover Type |
|------------------------------------|-----------------------|------------------------|-------------------------|--------------------------|-----------------------------|
| Forest | | | | | |
| Eastside Pine * | 20,288 | 4,164 | 65% | 13% | -52% |
| Lodgepole pine | 12 | 1 | 0% | 0% | negligible |
| Juniper | 301 | 90 | 1% | 0% | -1% |
| Sierran mixed conifer | 1,570 | 302 | 5% | 1% | -4% |
| Blue oak-gray pine | 177 | 11 | 1% | 0% | negligible |
| Montane hardwood-conifer | 370 | 111 | 1% | 0% | negligible |
| Montane hardwood | 294 | 12 | 1% | 0% | -1% |
| Montane riparian | 9 | 0 | 0% | 0% | |
| Subtotal Forest Type | 23,021 | 4,691 | 73% | 15% | -58% |
| Shrub-Herbacious | | | | | |
| Chaparral** | 4,854 | 435 | 15% | 1% | -14% |
| Sagebrush | 1,744 | 478 | 6% | 2% | -4% |
| Low sage | 442 | 235 | 1% | 1% | Negligible |
| Bitterbrush | 82 | 2 | 0% | 0% | Negligible |
| Annual grasslands | 4 | 2 | 0% | 0% | Negligible |
| Perennial grassland | 418 | 147 | 1% | 0% | Negligible |
| Wet meadow | 95 | 20 | 0% | 0% | Negligible |
| Lacustrine (Aquatic) | 33 | 9 | 0% | 0% | Negligible |
| Subtotal Shrub-Herbacious | 7,672 | 1,328 | 24% | 4% | -20% |
| Barren (rock, gravel, soil) | 631 | 25,305 | 2% | 81% | |
| Total Project Area | 31,324 | 31,322 | 100% | 100% | |

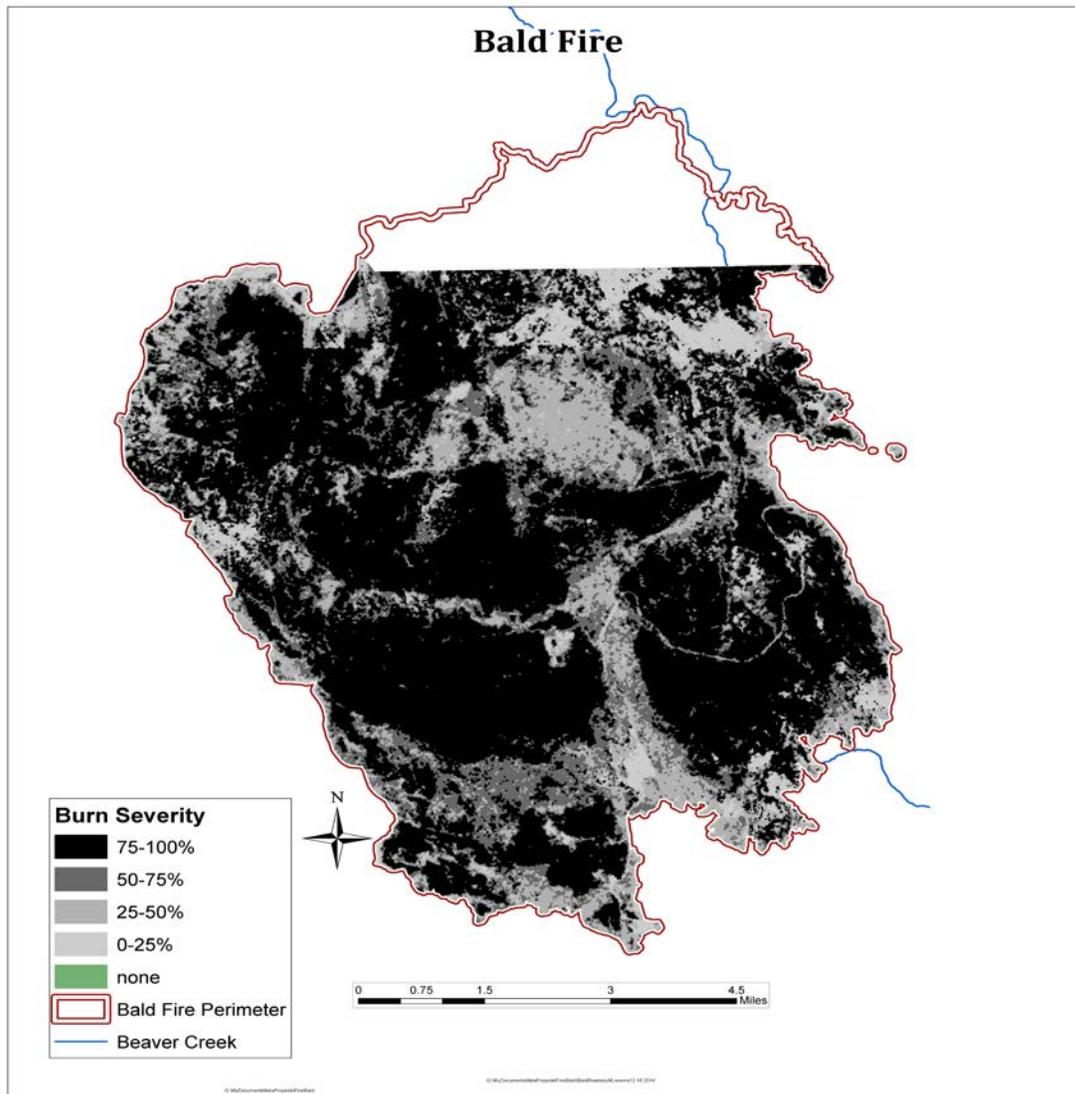
Within the fire, approximately 6,300 acres of non-forested habitats burned. These areas included chaparral, sagebrush, grasslands, and meadows. Approximately 18,300 acres of forested areas burned, primarily eastside pine. Juniper, mixed conifer, and hardwoods occurred in much smaller amounts on the landscape and were also burned to varying extents. Forested acres burned at various fire intensities, where low intensity indicates that tree mortality is minimal or none, while high intensity indicates that few, if any, green trees will survive. Measured by estimated basal area mortality, the acres and percent of forested acres burned in each severity category were³:

- No mortality: 40 acres; 0.2%
- 0-25% Very Low mortality: 823 acres; 3.4%
- 25-50% Low mortality: 4,423 acres; 18.1%
- 50-75% Moderate mortality: 5,387; 22%
- 75-100% High mortality: 13,741; 56.3%

Most of the existing mature green forest habitat for species such as northern goshawks was burned at high intensities. A total of 6,624 acres of California Wildlife Habitat Relationships (CWHR) strata 4M, 4D, 5M and 5D and 6 of all forest types was estimated to exist within the burn perimeter prior to the fire. As measured by estimated basal area mortality, the acres and percent of these mature forested acres burned in each severity category were:

- No mortality: 8 acres; 0.1%
- 0-25% Very Low mortality: 115 acres; 1.7%
- 25-50%, Low mortality: 864 acres; 13.1%
- 50-75%, Moderate mortality: 1,164 acres; 17.6%
- 75-100%, High mortality: 4,473 acres; 67.5%

³ See map below for an overview of the burn severity across the Bald Project area.



Individual Species Accounts

The following descriptions provide an account of the conditions relative to each the four USFS Sensitive species needing additional review and analysis regarding project effects (as determined in Table 1).

Northern Goshawk

Existing condition: species and habitat account

Nest site habitat characteristics are the most studied aspect of goshawk habitat use patterns. Studies consistently indicate that goshawk nest in stands with greater canopy cover, greater basal area, and greater numbers of large diameter trees, less shrub/sapling/understory cover and fewer numbers of small diameter trees relative to non-used, random sites (USDA 2001, Chpt. 3, p. 115).

Nest sites are generally on gentle to moderate slopes. High canopy cover was considered the most consistent structural feature across studies of goshawk nesting habitat (USDA 2001).

Habitats used by foraging goshawks have been less studied than habitats used for nesting. Beir and Drennan (1997) found that foraging goshawks in Arizona utilized foraging sites that had higher canopy closure, greater tree density and greater density of trees >40.6 cm (about 16") dbh than on contrast plots. However, because goshawks forage primarily by making a series of short flights that are punctuated by brief periods of prey searching from elevated perches (sit-and-wait predatory movements) (USDA 2001, Chpt 3, p. 116), it is unclear if they are foraging within these dense stands, or foraging from them, using dense trees as a form of ambush. For instance, Beir and Drennan (1997) suggested that in their study area, dense stands may have allowed goshawks to approach prey unseen.

Beir and Drennan (1997) suggested that foraging goshawks utilize all types of forested stands and exhibit flexible hunting strategies. Similarly, Reynolds et al (1992) suggested that goshawks may use habitat opportunistically for foraging, because goshawks are often confronted by mosaics of forest types and conditions while foraging within large home ranges, areas dominated by different but homogenous forest types or ages have supported nesting pairs, and direct observation of foraging goshawks show that they do hunt in many forest types and conditions. Goshawks may also take prey from within openings, usually hunting these areas using perches near the edge (Younk and Bechard 1994, cited in Graham et al 1999).

Goshawk Primary Activity Centers (PACs) are delineated to: (1) include known and suspected nest stands and (2) encompass the best available 200 acres of forested habitat for alternate nest sites and fledging in the largest contiguous patches possible, based on aerial photography. Where suitable nesting habitat occurs in small patches, PACs are defined as multiple blocks in the largest best available patches within 0.5 miles of one another. Best available forested stands for PACs have the following characteristics: (1) trees in the dominant and co-dominant crown classes average 24 inches dbh or greater; (2) in westside conifer and eastside mixed conifer forest types, stands have at least 70 percent tree canopy cover; and (3) in eastside pine forest types, stands have at least 60 percent tree canopy cover. Non-forest vegetation (such as brush and meadows) should not be counted as part of the 200 acres (USDA 2004, p 38). Desired conditions for forested stands within goshawks PACs are, 1) at least two tree canopy layers, 2) dominant and co-dominant trees with average diameters of at least 24 inches dbh, 3) at least 60-70% canopy cover, 4) some very large snags >45 inches dbh, and, 5) snag and down woody material levels that are higher than average (USDA 2004, p. 38).

PACs may be removed from the network after a stand-replacing event if the habitat has been rendered unsuitable as a northern goshawk PAC and there are no opportunities for re-mapping the PAC in proximity to the affected PAC (USDA 2004, p. 38).

Three goshawk PACs were known to be all or partly within the Bald Project area prior to the fire in 2014.

The Coble Mountain goshawk PAC is in the Coble Mountain area in the north-central portion of the fire perimeter. Coble Spring goshawk PAC is in the south-central portion of the project area. Both PACs were in areas dominated by moderate to high burn severity. Post-fire field surveys in and around the PACs were conducted by the district wildlife biologist as part of the Bald Fire Rapid Assessment. Based on the results of these surveys, the two goshawk PACs are rendered as unsuitable as goshawk nesting habitat, and as a result will be dropped from the network of goshawk PACs on the Lassen NF. A third PAC (Camp Goshawk PAC) is located mostly outside of the fire perimeter immediately to the southwest of the fire. 21 acres of the Camp PAC is located within the fire perimeter and burned at high severities. These acres were also rendered unsuitable as nesting habitat. Additional acres of suitable nesting habitat will be identified for the Camp PAC outside the fire perimeter, in order to manage for the replacement of the small amount of potential nesting habitat that was lost to the fire.

Pallid Bat

Existing Condition: species and habitat account

In 2001-2004, bat surveys using mist nets were conducted on the Eagle Lake Ranger District which is the USFS District adjacent to the Hat Creek Ranger District, where the Bald Project is located. Approximately 80 sites were surveyed and approximately 2,613 individual bats were trapped. Pallid bat individuals were caught at 37 of these sites, none of which were located within the Bald Project area. In addition, 13 pallid bat maternity roosts were located on the using radio-telemetry. All the maternity roosts were in trees, including one aspen, three incense-cedars, eight ponderosa and one Jeffrey pine. Average diameter of the roost trees was 30.3 inches diameter at breast height (dbh). The smallest diameter roost was 12.7" dbh aspen; while the smallest conifer roost tree was a 23.5" dbh ponderosa pine. None of these roosts were located within the Bald Project area. Results of this survey effort indicate that pallid bats were most common in the low elevation drier forest types such as eastside pine where this project resides.

Pallid bats roost in caves, rock and cliff crevices, as well as in snags or green trees which provide a roost structure such as a cavity or other deformity, and can be found in green forested habitats including mixed-conifer forests. Primary prey species are large, terrestrial arthropods such as scorpions, ground crickets and beetles (Hermanson and O'Shea 1983). The pallid bat is primarily a gleaner that typically forages close to the ground at distances less than 3 km from roosting sites (Barbour and Davis 1969, O'Shea and Vaughan 1977, Bell 1982, Johnston and Fenton 2001, all cited in Baker et al 2008).

Conservation measures for this species include reducing overstocked stand conditions and implementing vegetation treatments to create open understories that allow for unencumbered

flight (USDA 2001, Vol. 3, chapter 3, page 55). Pallid bats tend to be more prevalent foraging within edges, open stands and open areas without trees (USDA 2001, Vol. 3, chapter 3, part 4.4, page 55). In the project area, pallid bats are most likely found where ponderosa pine predominates or areas with an intermixture of black oaks, riparian areas, meadows, and open forested stands likely provide foraging habitat. Large rock outcrops, snags and other trees with suitable roosting structures provide roosting habitat.

Fringed Myotis

Existing Condition: species and habitat account

Fringed myotis individuals were trapped at several locations during district-wide bat surveys from 2001-2004 on the Eagle Lake Ranger District. Locations at which this species was recorded included sites within eastside pine forests and within mixed conifer forests. Trapping results indicate the species was not as numerous as other species encountered, but that fringed myotis were widely distributed across the District. Based on these results, fringed myotis could be present in low numbers within the Bald Fire area.

Where encountered on the Eagle Lake RD, more individuals were trapped at sites in drier, eastside pine forests compared to mixed-conifer sites. This is consistent with the available literature, which indicates that although fringed-tailed myotis use a fairly broad range of habitats, the most common habitats are oak, pinyon, and juniper woodlands or ponderosa pine forest at middle elevations. They also appear to use deserts, grasslands, and other types of woodlands. When trying to generalize all published information, this species is mostly found in dry habitats where open areas (e.g., grasslands and deserts) are interspersed with mature forests (usually ponderosa pine, pinyon-juniper, or oak), creating complex mosaics with ample edges and abundant snags (Keinath 2004).

Although historically considered a bat that roosts in caves and buildings, Rabe et al (1998) and Weller and Zabel (2001) have documented use of tree roosts by this species. Similar to Weller and Zabel (2001), Rabe et al (1998) also found roosts to be in areas of higher snag densities, and suggested that the larger snags used by bats may have been found in areas of higher snag density due to the local conditions that favored snag creation, such as beetle kill, lightning, wildfire or and disease. Lacki and Baker (2007) in ponderosa pine-dominated forests in Washington and Oregon found fringed bats to roost predominantly in rock crevices. Snags that were used as roosts were all ponderosa pine snags.

Fringed-tailed myotis are considered to feed predominantly on beetles and moths, with other items like spiders, flies, lacewings and leafhoppers also included. Consumption of prey may be a function of prey availability more than this bat species consistently selecting one type of insect over others (Verts and Carraway 1998).

Western Bumble Bee

Existing Condition: species and habitat account

Bumble bee surveys were conducted on the adjacent Eagle Lake RD in 2013 and 2014. Western bumble bees were located within 24 sites during this survey effort. None of the western bumble bees were found on invasive plant species; all were located on the flowers of native species. Based on these survey results, potential habitat for this species would occur within the Bald Fire, especially within or near wet meadows, riparian areas, springs or other areas that provide a diversity of flowering plants during the summer season. It is likely that the species is present within the Bald Fire perimeter.

The western bumble bee has experienced severe declines in distribution and abundance due to disease and other factors including loss of genetic diversity, habitat loss and habitat fragmentation (Tommasi et al. 2004, Cameron et al. 2011, Koch et al. 2012). Bumble bees brought from Europe for commercial pollination apparently carried a microsporidian parasite, *Nosema bombi*, which has been introduced into native bumble bee populations. Highest incidences of declining *B. occidentalis* populations are associated with highest infection rates of the *Nosema* parasite. The incidence of *Nosema* infection is significantly higher in the vicinity of greenhouses that use imported bumble bees for pollination of commercial crops (Cameron et al. 2011). Major threats that alter landscapes by removing and fragmenting preferred habitat include conversion to agricultural croplands and urban development.

Bumble bees feed on the nectar and pollen of flowering plants. A nearly constant supply of flowering plants is critical to colony growth and development (Koch et al 2012). Foraging activity begins in the spring and continues until individuals are largely absent by the end of September. During the season, a range of 50 to hundreds of individuals may be produced depending on the quantity and quality of flowers available. Western bumble bees have a short proboscis or tongue length relative to other co-occurring bumble bee species, which limits the variety of flower species it is able to exploit to flowers with short corolla lengths. Across their range, western bumble bees have been observed taking nectar from a variety of flowering plants, including *Aster* spp., *Brassica* spp., *Centaurea* spp., *Cimicifuga arizonica*, *Corydalis caseana*, *Chrysothamnus* spp., *Cirsium* spp., *Delphinium nuttallianum*, , *Erythronium grandiflorum*, *Foeniculum* spp., *Geranium* spp.,, *Grindelia* spp., *Haplopappus* spp., *Hypochoeris* spp., *Ipomopsis aggregata*, *Lathyrus* spp., *Linaria vulgaris*, *Lotus* spp., *Lupinus monticola*, *Mentha* spp., *Medicago* spp., *Melilotus* spp., *Mertensia ciliata*, *Monardella* spp., *Nama* spp., *Orthocarpus* spp., *Pedicularis groenlandica*, *Penstemon procerus*, *Phacelia* spp., *Prunus* spp., *Raphanus* spp., *Rhododendron* spp., *Salix* spp., *Salvia* spp., *Solidago* spp., *Symphoricarpos* spp., *Tanacetum* spp., *Taraxacum* spp., *Trifolium dasyphyllum*, *Trichostema* spp., and *Trifolium* spp. (Evans et al. 2008).

IV. EFFECTS OF THE PROPOSED ACTION AND ALTERNATIVES

For each of the USFS Sensitive Species where additional analysis was needed (results of Table 1), provided below is a review of the potential direct, indirect and cumulative effects of each action alternative, as well as a discussion of the no action. For each species, a determination of effects is also provided that is based upon the potential effects of the action alternatives.

This analysis assumes that current environmental conditions are a result of effects from past actions. Existing conditions reflect the aggregate effect of all previous human actions and natural events that have affected the environment and might contribute to cumulative effects.

Northern Goshawk – Alternative 1 – Proposed Action

Direct and Indirect Effects

As stated in the existing environment section, high severity burn effects, which accounts for the majority of the burned area, are found throughout fire with very large patch sizes. Only small portions of green forest habitat survived the fire, and those that did are small and highly fragmented and thus, do not provide suitable nest stands and associated PAC acres for goshawk. Removal of dead and dying trees is the target of all harvest activities and would only affect a small number of green trees that exist as isolated trees or small patches within larger burned areas. Removal of occasional isolated green trees would not be expected to change the CWHR classification of stands and thus salvage harvest, fuels treatments, hazard tree removal, and other activities in the proposed action would not be expected to reduce the acres of any remnant patches of green forest habitat. Though most potential goshawk nesting habitat has already been lost throughout the project area because of the fire, surviving green forest goshawk habitat would not be rendered unsuitable by the proposed action because any green stands that are large enough to be identified in CWHR modeling have not been proposed for treatment.

High severity wildfire can result in long-term reductions in goshawk habitat due to decline of existing large tree component and densely forested stand structure, as well as short- and long-term reductions in forest structural diversity provided by mature forest patches. Foraging goshawks may take advantage of the short-term increase in prey availability resulting from the increase in snag and down wood component throughout the burn, especially on edges adjacent to low severity and unburned habitat. Under the proposed action, habitat elements such as snags and future downed woody debris would be reduced within salvage units, and may reduce the quality of salvage units for northern goshawk foraging in the short-term. However, due to the nature of the fire, and the large patches of high severity fire within the interior of the burn, salvage units are generally not located adjacent to green forest habitat. Salvage units are focused predominantly in

larger patches of forest which burned at high fire severity and are not located within largely contiguous green forest patches.

Snags function as goshawk hunting perches throughout the landscape. The proposed action would reduce potential foraging habitat in the short term by removing snags more quickly than they otherwise would have fallen. It is estimated that snags may remain standing for 10 or 20 years after the initial burn. Project design standards would help mitigate this effect by identifying a series of wildlife retention areas within 20% of each proposed salvage and fuel treatment unit.

Proposed in this alternative are 4,815 acres of roadside hazard tree removal, 3,632 acres of salvage harvest, and 5,499 acres of fuels treatment. For safety reasons, wildlife retention islands would not be identified in hazard tree removal units. Considering that the salvage and fuels reduction treatments total 9,131 acres, approximately 20% of each treatment type would be retained in un-harvested and untreated patches which amounts to approximately 1,800 acres of snag habitat, within harvest units, that would be retained in its current condition relative to snag densities, and which would provide some opportunities for foraging for goshawk.

Follow-up site preparation and tree planting within salvage units under the proposed action would accelerate the re-establishment of conifer seedlings within harvested areas, resulting in re-establishment of forested habitat sooner than under the no action alternative. In the long term there would be beneficial effects of this alternative in restoring forested habitats that would in time enhance foraging and eventually nesting habitat for goshawk relative to the no action. Project design would maintain understory vegetation in the subsequent plantations, and would insure that other vegetative communities, such as aspen, are considered in both site preparation and reforestation. These considerations would help insure habitat for small mammal and bird species within reforested areas, and should serve to enhance prey populations more so than if all plantations were planted and managed to conventional standards.

In summary, the salvage treatments under the proposed action may cause minor short-term reductions in foraging opportunities for northern goshawks, but in combination with tree planting would enhance the re-establishment of forest conditions in the long-term. Salvage treatments would also reduce the adverse effects of future wildfire on the remaining suitable habitat by managing fuel profiles to enhance the ability of fire suppression resources to safely and effectively control future wildfires. The degree of the short-term effects would be minimized to some extent by the snag retention, large woody debris guidelines and consideration for the retention of understory vegetation and other vegetative communities within treatment areas.

Other potential effects include project-related activities such as human presence, mechanical activity, and noise created by project implementation. Disturbance from project activities could temporarily decrease goshawk foraging efficiency and disrupt typical behavior patterns. If present, individuals might alter their behavior by avoiding portions of the project area during implementation. The displacement, if it occurred at all, would be short-term and temporary until

project actions at a given location are completed. Due to the availability of suitable goshawk habitat outside the burned perimeter and avoided green or untreated areas within the fire perimeter, temporary displacement of foraging goshawks to adjacent suitable habitat would be negligible.

Cumulative Effects

The goshawk cumulative effects analysis area for this project was considered to be the Bald Fire perimeter (which includes 8,200 additional acres, made up of approximately 7,000 acres of BLM, 500 acres State, and 700 acres private, plus a small portion of the Camp goshawk PAC that extends outside of burn perimeter. The cumulative effects analysis area was not extended beyond this due to lack of measurable direct and indirect effects at larger scales, and because goshawk foraging habitat includes an extremely wide range of forest structural types; the species is essentially a habitat generalist at larger, landscape scales. On-going projects to be considered within the cumulative effects area include 450 acres of additional salvage and reforest operations on BLM, an assumption that State and private lands would salvage and reforest their burned forests, and fuelwood harvest on USFS lands.

Within the fire perimeter, the primary actions that could represent cumulative effects are fire salvage and reforestation actions on private lands that were burned, and fuelwood harvest on USFS lands. Limited fire salvage is ongoing at the time of this writing, and reforestation will occur on BLM timberlands within the fire footprint. This would represent a short-term reduction in foraging habitat on BLM lands, since salvage would remove most or all standing snags more quickly than they would otherwise topple. Similar to the effects on USFS lands, much of non-USFS timber lands burned at high severity and little green forest remains. Snag habitat retention on USFS lands through wildlife patch retention and untreated areas will help compensate for some of the losses on non-USFS lands. The cumulative effects of the loss of burned forest habitat, which is marginal for goshawk to begin with due to lack of adjacent nesting, would not constitute a substantive cumulative effect.

Personal fuelwood harvest would occur within the Bald footprint on USFS lands. The Lassen NF has one of the most active fuelwood programs in the region, selling over 16,000 cord permits in 2011. This program allows the felling of snags by woodcutters, with upper diameter limits set at 20" dbh for snags of commercial species of conifers, and with no diameter restrictions on lodgepole pine snags. Woodcutters are allowed to travel off road to access snags. Due to woodcutting activity in the fall of 2014 after the fire, including the felling and removal of oversized incense-cedar snags, the fire was signed "closed" until salvage operations were completed. Fuelwood gathering would again be permitted after salvage operations are complete. As such, snags retained from salvage harvest would be subject to removal as fuelwood if accessible. Siegel et al (2013) in their monitoring of black-backed woodpeckers in the Peterson

and Wheeler fires on the Lassen and Plumas NFs, respectively, noted woodcutting to be pervasive along roads of both fires. Fuelwood harvest would primarily occur immediately along roads, as well as in relatively flat areas that allow off-road travel, such as along user-created roads, post-harvest skid trails, or along meadow edges. As part of the design of this project and for safety reasons, snag retention clumps avoided the adjacent 150 feet of ML2 or greater roads where snags would be considered as hazards. Thus retained snag patches will be somewhat removed from roadsides and should be less accessible than if they were located adjacent to roads. The presence of stumps along roadsides corridors may also make off road travel difficult. Inevitably some retained snags will likely be removed by fuelwood harvesters. However, given the large areas of snag retention (see discussion in Direct and Indirect Effects), untreated portions of the cumulative effects area, and the presence of slopes and other features that would limit access, most of the fuelwood harvest would be localized to areas that are accessible, as indicated by Siegel et al (2013). Since it is along roads that hazard trees will be felled and removed as part of the proposed action, which coincides with the greatest proportion of snags that would be vulnerable to woodcutters would be removed anyway as part of this proposed action, the proposed activities should not result in a substantial decrease in snags across all the lands involved in the fire.

The Camp goshawk PAC was slightly overlapped by the Bald Fire, with the Fire burning about 21 acres of the PAC. These acres were rendered unsuitable as goshawk nesting habitat and will need to be replace in order to bring the PAC up to the desired size of 200 acres. Unburned habitat exists in other areas outside of the Bald Fire perimeter to the West, and adjacent to the remaining areas of the Camp PAC. A specific 20 acre mature stand will be identified by the District Wildlife Biologist and managed into the future as part of the PAC. This management, along with the relatively stable geographic distribution and population levels of goshawks in the area and Lassen NF would not significantly reduce goshawk habitat or populations when also considering past, present, or foreseeable future events in the cumulative effects analysis area”

Determination for Alternative 1:

Given the above analyses, it is my determination that the proposed activities within Alternative 1 of the Bald Fire Salvage and Restoration Project may affect individual northern goshawks, but is not likely to result in a trend towards federal listing or loss of species viability.

Northern Goshawk - Alternative 2 – No Action

Direct, Indirect and Cumulative Effects

In this alternative, there would be no substantive reductions in burned or green goshawk forest habitat on USFS lands as a result of management activities. Hazard trees along roads would be subject to being felled and left in place as downed logs. Such logs and accessible snags within the fire perimeter would be subject to being removed as fuelwood by woodcutters. Both

activities would cause a minor reduction in the overall total of burned forest habitat, with most of the fuelwood activity confined to roadsides or other accessible areas. Such activities would affect relatively few of the burned acres on USFS lands. Over the majority of the burned acres, snags would remain until they naturally fall due to decay. Vegetation would go through natural recovery and regeneration, and there would be little or no disturbance to foraging goshawks.

Existing levels of large woody debris and snags would be maintained, and may provide enhanced short-term foraging opportunities to the northern goshawk, particularly adjacent to suitable, unburned forest habitat. However, over the large area of the fire, forest regeneration that eventually develops into mature forest preferred by goshawk would be expected to take much longer compared to the proposed action since trees would not be re-planted by hand, and large patches of high intensity burned areas would lack a conifer seed source. As a result, long term development of potential goshawk nest habitat would take much longer than the proposed action.

Northern Goshawk - Alternative 3 – Road Hazard Tree Removal

Direct and Indirect Effects

In this alternative, saw-timber sized hazard trees along roads would be subject to being felled and removed, while sub-merchantable trees along roads may be felled and left as logs or piled and burned. Hazard tree abatement would thus cause a minor reduction in the overall total of burned forest habitat on USFS lands within the Bald Fire. Such activities would affect 15% (relatively few) of the 31,324 burned acres on USFS lands and over the majority of the total burned acres snags would remain until they fell naturally due to decay. Vegetation would go through natural recovery and there would be little potential of disturbance to foraging goshawks since all activities occur along already open roads.

Existing levels of large woody debris and snags would be maintained, and may provide enhanced short-term foraging opportunities to the northern goshawk, particularly adjacent to suitable, unburned forest habitat. Natural forest regeneration would be expected to take much longer as compared to the proposed action to re-establish forested conditions in the project area, especially given the very large patch size of high severity fire in which no conifer seed source would be available to seed back in to initiate natural reforestation.

Cumulative Effects

The cumulative effects analysis area is as described under Alternative 1. Due to the lack of salvage harvests other than roadside hazard tree removal in this alternative, potential for adverse cumulative effects of salvage harvest on non-USFS lands are further reduced compared to Alternative 1. As with Alternative 2 over the large area of the fire, forest regeneration that eventually develops into mature forest preferred by goshawk would be expected to take much longer compared to the proposed action since trees would not be re-planted by hand, and large

patches of high intensity burned areas would lack a conifer seed source. Accessible logs and snags within the fire perimeter would be subject to being removed as fuelwood by woodcutters. However, since the effects of woodcutting is typically most pervasive along roads (Siegel et al 2013), and it would be in these areas that hazard trees would be removed commercially as a result of this alternative, the effects of woodcutting unburned forest habitat would be diminished.

Determination – Alternative 3

Given the above analysis, it is my determination that the proposed activities for Alternative 3 of the Bald Fire Salvage and Restoration Project may affect individual of northern goshawks, but is not likely to result in a trend towards federal listing or loss of species viability.

Pallid Bat – Alternative 1 – Proposed Action

Direct and Indirect Effects

Bats, including pallid bat, have been shown to respond positively to wildfire, including high-severity wildfire. As discussed by Buchalsky et al (2013), observations of increased bat activity after disturbance (such as timber harvest, thinning or prescribed fire) could be related to decreased amount of clutter in the forest canopy, increased abundance of insect prey, or increased quantity and/or quality of roost habitat as a result of trees killed or damaged by fire. The Bald Fire accomplished all three of the above factors: it reduced clutter in the canopy that affects bat flight, it will increase insect abundance within the burned footprint, and it resulted in thousands of acres of snags.

In the Buchalsky et al (2013) study, pallid bats showed a positive response to fire, with no differentiation in activity between moderate and high severity fire areas. The authors suggest that an increased abundance of flying insects played an important role in the patterns they observed of increased bat activity after a mixed-severity wildfire in mixed-conifer forests of the Sierra Nevada. As a result of their findings, Buchalsky et al (2013) considered the occurrence of fire on the landscape to be an important process for the maintenance of forest bat communities. The ecological importance of fire-created snag habitat and early seral forest stages were recognized in the design of this alternative. As a result, wildlife retention islands will be left nearly undisturbed across 20% within salvage and fuels units to balance the retention of snag/burned habitat features, while still meeting multiple-use objectives on FS lands. These are discussed below.

Proposed in this alternative are 4,815 acres of roadside hazard tree removal, 3,632 acres of salvage harvest, and 5,499 acres of fuels treatment. For safety reasons, wildlife retention islands would not be identified in hazard tree removal units because they are next to open roads. Within salvage and fuels treatments which total 9,131 acres, approximately 20% of each treatment type would be retained in un-harvested and untreated patches which amounts to approximately 1,800 acres of snag habitat, within harvest units, that would be retained in its current condition relative

to snag densities. These retention areas would provide snag roosting habitat for pallid bats, adjacent to treated areas that provide for foraging. An additional 16,961 acres (54%) will remain untreated (natural recovery) across the project area and will also continue to provide well distributed bat roosting habitat. Of the 31,324 acres that burned on USFS lands, this alternative proposes reforestation on approximately 39% of the burn (12,226 acres) on sites prepared by salvage harvest, fuels treatments, and reforestation only. The remainder of the burn area is expected to recover on its own. Reforestation strategies vary in terms of tree planting density based on whether or not the land is allocated as a timber emphasis (higher density plantings) versus wildlife emphasis or is adjacent to desired natural vegetation or features such as black-oak, aspen, streams and meadows. Cluster planting and wide-spaced conventional planting would leave larger gaps between planted trees than in traditional reforestation. Conifers would not be planted within 20 feet of live black oak tree crowns, including sprouts greater than three feet tall. Reforestation of conifers would also not occur within 150 feet of aspen and cottonwood communities on the east, south, and west sides of the community, or 100 feet on the north side to maximize light to the stand and allow for expansion. Reforestation would not occur within 50 feet of the meadow edge or within 20 feet of stream channels and seasonal wetlands with existing riparian communities. All of these strategies to alter planting densities in or near oak, aspen, cottonwoods, meadows, stream channels and seasonal wetlands would serve to retain and promote desired ground cover. With reforestation representing about 39% of burned area, and varying techniques of reforestation being proposed, an abundance and diversity of understory vegetation will be retained throughout the project area.

Together, the design features related to snag retention and reforestation will serve to retain many of the features that are thought to make burned areas valuable as bat habitat (snags, and an abundant understory vegetation leading to an increase in insects), while still allowing multiple-use objectives to be met within the burned area. While salvage operations and removal of fire-killed trees would reduce habitat for potential prey species such as wood-boring and bark beetles, the combination of retention areas, untreated areas, and an increase in understory vegetation would continue to provide for greater insect prey abundance than what likely occurred pre-fire.

The direct effects to pallid bats are potential disturbance to roosting individuals during salvage/fuels operations. Pallid bats are considered to be sensitive to roost site disturbance (Zeiner et al 1990), and may locate their roosts in lower portions of snags with basal scars. Thus there is potential for the flushing of this species from roost trees as mechanical operations occur adjacent to a roost snag. Direct mortality to bats is unlikely since the species is sensitive to mechanical disturbance and would likely abandon roost sites prior to tree falling.

Cumulative Effects

The cumulative effects analysis area for this species was expanded from the USFS lands within the fire perimeter to the larger Bald Fire footprint in order to consider activities on non-USFS lands burned by the Bald Fire that are adjacent to USFS lands. This includes 8,200 additional acres, made up of approximately 7,000 acres of BLM, 500 acres State, and 700 acres private. The analysis area was not expanded further because, 1) no spatially-oriented standards and guidelines or LOPs are associated with this species, 2) individuals do not have defined spatial territories that can be mapped or assessed, and, 3) there are no areas adjacent to the Bald Fire area that represent unique habitat opportunities for these species that would warrant inclusion. On-going projects to be considered within the cumulative effects area include 450 acres of additional salvage and reforest operations on BLM, an assumption that State and private lands would salvage and reforest their burned forests, and fuelwood harvest on USFS lands.

Personal fuelwood harvest would occur within the Bald Fire footprint on USFS lands. The Lassen NF has one of the most active fuelwood programs in the region, selling over 16,000 cord permits in 2011. This program allows the felling of snags by woodcutters, with upper diameter limits set at 20" dbh for snags of commercial species of conifers, and with no diameter restrictions on lodgepole pine snags. Woodcutters are allowed to travel off road to access snags. Due to woodcutting activity in the fall of 2014 after the fire, including the felling and removal of oversized incense-cedar snags, the fire was signed "closed" until salvage operations were completed. Fuelwood gathering would again be permitted after salvage operations are complete. Snags that are left in retention areas within treatment units are subject to removal as public firewood if accessible. Siegel et al (2013) in their monitoring of black-backed woodpeckers in the Peterson and Wheeler fires on the Lassen and Plumas NFs, respectively, noted woodcutting to be pervasive mostly along open roads of both fires. Thus, public fuelwood gathering is expected to occur immediately along roads in relatively flat areas, along user-created roads, along post-harvest skid trails, meadow edges and other features that allow easy access. As part of the design of this project, retention islands were not placed within about 150 feet of ML2 or greater roads because snags would be considered a safety hazard. Thus retained snag patches would be removed from roadsides and are less accessible. Also, the presence of stumps along roadside corridors discourages lengthy off road travel. Inevitably some retained snags will still be removed by fuelwood harvesters, but most of the fuelwood harvest should be localized to areas that are accessible, as indicated in the Siegel et al (2013) study.

Baker et al (2008) found that pallid bats roosted in large trees greater than 100 cm dbh (about 39 inches) in diameter. On the nearby Eagle Lake RD, the average diameter of the roost trees was 30.3" dbh, and the smallest diameter conifer roost tree was a 23.5" dbh ponderosa pine. Thus the fuelwood diameter restrictions of 20 inches dbh on snags of commercial tree species would help retain larger diameter trees preferred by pallid bats. Thus, firewood cutting should

not result in a substantial decrease in snags or potential pallid bat roost trees across the USFS lands involved in the project.

Determination for Pallid Bat – Alternative 1

Given the above analysis, it is my determination that the proposed activities within Alternative 1 of the Bald Fire Salvage and Restoration Project may affect individual pallid bats, but is not likely to result in a trend towards federal listing or loss of species viability.

Pallid Bat - Alternative 2 – No Action

Direct, Indirect and Cumulative Effects

As discussed previously, pallid bats have been shown to respond positively to wildfire (Buchalsky et al 2013). Observations of increased bat activity after disturbance (such as timber harvest, thinning or prescribed fire) could be related to decreased amount of clutter in the forest canopy, increased abundance of insect prey, and increased quantity and/or quality of roost habitat as a result of trees killed or damaged by fire. The Bald Fire advanced all three of the above factors by reducing green tree canopy (clutter), increasing insect abundance associated with vegetation regrowth after the fire, and resulting in thousands of acres of newly burned snags. Buchalsky et al 2013 suggests that an increased abundance of flying insects played an important role in observed increases in bat activity after a mixed-severity wildfire in mixed-conifer forests of the Sierra Nevada. They considered the occurrence of fire on the landscape to be an important process for the maintenance of forest bat communities.

In this No Action Alternative, there would be no substantive reductions in burned forest habitat on USFS lands as a result of management activities. Hazard trees along roads would be subject to being felled and left in place as downed logs as part of normal road maintenance. Such logs and accessible snags would however be subject to being removed as fuelwood by woodcutters. Although firewood gathering would cause a minor reduction in understory vegetation within the localized areas affected, such activity would affect relatively few of the 31,324 burned acres on USFS lands. Nearly all of the burned acres snags would remain until they fell over due to decay and vegetation would go through natural recovery. The factors created by wildfire that result in increased bat activity (reduced canopy clutter, increased insect production and increased snag availability) would all remain unaffected in this alternative, which would sustain these factors in greater amounts and for longer into the future than would Alternatives 1 and Alternative 3.

Given the large patches of high severity fire within the Bald Fire area, the lack of reforestation activities in the No Action would substantially delay a return of forest cover to burned areas that are distant to an existing conifer seed source. There would be a substantial delay in growing a new cohort of pallid bat roost trees within the fire footprint.

Pallid Bat – Alternative 3 – Road Hazard Tree Removal

Direct and Indirect Effects

As discussed previously, pallid bats have been shown to respond positively to wildfire (Buchalsky et al 2013). Observations of increased bat activity after disturbance (such as timber harvest, thinning or prescribed fire) could be related to decreased amount of clutter in the forest canopy, increased abundance of insect prey, and increased quantity and/or quality of roost habitat as a result of trees killed or damaged by fire. The Bald Fire advanced all three of the above factors by reducing green tree canopy (clutter), increasing insect abundance associated with vegetation regrowth after the fire, and resulting in thousands of acres of newly burned snags. Buchalsky et al 2013 suggests that an increased abundance of flying insects played an important role in observed increases in bat activity after a mixed-severity wildfire in mixed-conifer forests of the Sierra Nevada. They considered the occurrence of fire on the landscape to be an important process for the maintenance of forest bat communities.

In this alternative, hazard trees along roads that are of saw timber size would be felled and removed, and sub-merchantable hazard trees would be felled, piled and burned or left in place. Both activities would cause a minor reduction in understory vegetation within the localized areas affected. Compared to the No Action Alternative 2, the felling and removing as well as potential pile burning would cause a slight reduction in understory vegetation due to the effects of burn piles and the creation of landings for the processing of trees for removal. However such activities would affect approximately 15% (4,736 acres), a small proportion of the 31,324 burned acres on USFS lands. Over the majority of the burned acres snags would remain until they toppled due to decay, and vegetation would go through natural recovery. As a result, the factors created by wildfire that may result in increased bat activity would remain unaffected in this alternative on approximately 85% of the burned area on USFS lands and sustain these factors in greater amounts and for longer into the future than would Alternative 1.

Given large patches of high severity fire within the Bald Fire area, the lack of reforestation activities in untreated areas (approximately 85% of the burn perimeter) would substantially delay a return of forest cover to areas that are distant to an existing conifer seed source. As such, there would be a substantial delay in reestablishing a new cohort of suitable bat roost trees.

Cumulative Effects

The cumulative effects analysis area was as described for Alternative 1.

Personal fuelwood harvest would occur within the Bald Fire footprint on USFS lands. The Lassen NF has one of the most active fuelwood programs in the region, selling over 16,000 cord permits in 2011. This program allows the felling of snags by woodcutters, with upper diameter limits set at 20" dbh for snags of commercial species of conifers, and with no diameter

restrictions on lodgepole pine snags. Woodcutters are allowed to travel off road to access snags. Due to woodcutting activity in the fall of 2014 after the fire, including the felling and removal of oversized incense-cedar snags, the fire was signed “closed” until salvage operations were completed. Fuelwood gathering would again be permitted after salvage operations are complete. Snags that are left in retention areas within treatment units are subject to removal as public firewood if accessible. Siegel et al (2013) in their monitoring of black-backed woodpeckers in the Peterson and Wheeler fires on the Lassen and Plumas NFs, respectively, noted woodcutting to be pervasive mostly along open roads of both fires. Thus, public fuelwood gathering is expected to occur immediately along roads in relatively flat areas, along user-created roads, along post-harvest skid trails, meadow edges and other features that allow easy access. As part of the design of this project, retention islands were not placed within about 150 feet of ML2 or greater roads because snags would be considered a safety hazard. Thus retained snag patches would be removed from roadsides and are less accessible. Also, the presence of stumps along roadside corridors discourages lengthy off road travel. Inevitably some retained snags will still be removed by fuelwood harvesters, but most of the fuelwood harvest should be localized to areas that are accessible, as indicated in the Siegel et al (2013) study.

Baker et al (2008) found that pallid bats roosted in large trees greater than 100 cm dbh (about 39 inches) in diameter. On the nearby Eagle Lake RD, the average diameter of the roost trees was 30.3” dbh, and the smallest diameter conifer roost tree was a 23.5” dbh ponderosa pine. Thus the fuelwood diameter restrictions of 20 inches dbh on snags of commercial tree species would help retain larger diameter trees preferred by pallid bats. Thus, firewood cutting should not result in a substantial decrease in snags or potential pallid bat roost trees across the USFS lands involved in the project.

Determination for Pallid Bat – Alternative 3

Given the above analysis, it is my determination that the proposed activities within Alternative 3 of the Bald Fire Salvage and Restoration Project may affect individual pallid bats, but is not likely to result in a trend towards federal listing or loss of species viability.

Fringed Myotis – Alternative 1- Proposed Action

Direct and Indirect Effects

Bats, including fringed myotis, have been shown to respond positively to wildfire, including high-severity wildfire (Buchalsky et al 2013). As discussed by Buchalsky et al (2013), observations of increased bat activity after disturbance (such as timber harvest, thinning or prescribed fire) could be related to decreased amount of clutter in the forest canopy, increased abundance of insect prey, or increased quantity and/or quality of roost habitat as a result of trees killed or damaged by fire. The Bald Fire accomplished all three of the above factors: it reduced

clutter in the canopy that affects bat flight, it will increase insect abundance within the burned footprint, and it resulted in thousands of acres of snags.

In the Buchalsky et al (2013) study, bats showed a positive response to fire, with no differentiation in activity between moderate and high severity fire areas. The authors suggest that an increased abundance of flying insects played an important role in the patterns they observed of increased bat activity after a mixed-severity wildfire in mixed-conifer forests of the Sierra Nevada. As a result of their findings, Buchalsky et al (2013) considered the occurrence of fire on the landscape to be an important process for the maintenance of forest bat communities. The ecological importance of fire-created snag habitat and early seral forest stages were recognized in the design of this alternative. As a result, wildlife retention islands will be left nearly undisturbed across 20% within the salvage and fuels units to balance the retention of snag/burned habitat features while still meeting multiple-use objectives on FS lands. These are discussed below.

Proposed in this alternative are 4,815 acres of roadside hazard tree removal, 3,632 acres of salvage harvest, and 5,499 acres of fuels treatment. For safety reasons, wildlife retention islands would not be identified in hazard tree removal units because they are next to open roads. Within salvage and fuels treatments which total 9,131 acres, approximately 20% of each treatment type would be retained in un-harvested and untreated patches which amounts to approximately 1,800 acres of snag habitat, within harvest units, that would be retained in its current condition relative to snag densities. These retention areas would provide snag roosting habitat for fringed myotis adjacent to treated areas that provide for foraging. An additional 16,961 acres (54%) will remain untreated (natural recovery) across the project area and will also continue to provide well distributed bat roosting habitat.

Of the 31,324 acres that burned on USFS lands, this alternative proposes reforestation on approximately 39% of the burn (12,226 acres) on sites prepared by salvage harvest, fuels treatments, and reforestation only. The remainder of the burn area is expected to recover on its own. Reforestation strategies vary in terms of tree planting density based on whether or not the land is allocated as a timber emphasis (higher density plantings) versus wildlife emphasis or is adjacent to desired natural vegetation or features such as black-oak, aspen, streams and meadows. Cluster planting and wide-spaced conventional planting would leave larger gaps between planted trees than in traditional reforestation. Conifers would not be planted within 20 feet of live black oak tree crowns, including sprouts greater than 3 feet tall. Reforestation of conifers would also not occur within 150 feet of aspen and cottonwood communities on the east, south, and west sides of the community, or 100 feet on the north side to maximize light to the stand and allow for expansion. Reforestation would not occur within 50 feet of meadow edge or within 20 feet of stream channels and seasonal wetlands with existing riparian communities. All of these strategies to alter planting densities in or near oak, aspen, cottonwoods, meadows, stream channels and seasonal wetlands would serve to retain and promote desired understory vegetation. With reforestation representing about 39% of burned area, and varying techniques of reforestation

being proposed, an abundance and diversity of understory vegetation will be retained throughout the project area.

Together, the design features related to snag retention and reforestation will serve to retain many of the features that are thought to make burned areas valuable as bat habitat (snags, and an abundant understory vegetation leading to an increase in insects), while still allowing multiple-use objectives to be met within the burned area. While salvage operations and removal of fire-killed trees would reduce habitat for potential prey species such as wood-boring and bark beetles, the combination of retention areas, untreated areas, and an increase in understory vegetation would continue to provide for greater insect prey abundance than what likely occurred pre-fire.

The primary potential for direct effects to fringed myotis is disturbance to roosting individuals during salvage operations. Fringed myotis are very sensitive to roost site disturbance. There is potential for the flushing of fringed myotis from roost trees as salvage operations occur adjacent to a roost snag. There may also be some potential for mortality if roosting trees are removed while bats are roosting within them, though this is unlikely to adults as sensitivity to disturbance would likely cause the bats to abandon roost sites prior to tree falling. Due to salvage harvest occurring in the first spring and summer following the fire, occupancy of fire-killed trees by fringed myotis may be lower than what would be expected in later years. Roost placement in snags is often behind exfoliating bark and also in crevices resulting from lightning strikes and from broken tops (Rabe et al 1998), Weller and Zabel 2001). Use of fire-killed trees as roosts would thus likely increase in years post-fire as bark loosens and structural defects start to accumulate within standing snags. In addition to tree roosts, Lacki and Baker (2007) found fringed myotis in xeric regions of Oregon and Washington to commonly roost in crevices of rocks within outcrops and boulder fields. Therefore, potential for direct effects of this project, while present, are likely negligible for this species.

Cumulative Effects

The cumulative effects analysis area for this species was expanded from the USFS lands within the fire perimeter to the larger Bald Fire footprint in order to consider activities on private lands burned by the Bald Fire that are adjacent to USFS lands. This includes 8,200 additional acres made up of approximately 7,000 acres of BLM, 500 acres State, and 700 acres private. The analysis area was not expanded further because, 1) no spatially-oriented standards and guidelines or LOPs are associated with this species, 2) individuals do not have defined spatial territories that can be mapped or assessed, and, 3) there are no areas adjacent to the Bald Fire area that represent unique habitat opportunities for these species that would warrant inclusion. On-going projects to be considered within the cumulative effects area include 450 acres of additional salvage and reforest operations on BLM, an assumption that State and private lands would salvage and reforest their burned forests, and fuelwood harvest on USFS lands.

Personal fuelwood harvest would occur within the Bald Fire footprint on USFS lands. The Lassen NF has one of the most active fuelwood programs in the region, selling over 16,000 cord permits in 2011. This program allows the felling of snags by woodcutters, with upper diameter limits set at 20" dbh for snags of commercial species of conifers, and with no diameter restrictions on lodgepole pine snags. Woodcutters are allowed to travel off road to access snags. Due to woodcutting activity in the fall of 2014 after the fire, including the felling and removal of oversized incense-cedar snags, the fire was signed "closed" until salvage operations were completed. Fuelwood gathering would again be permitted after salvage operations are complete. Snags that are left in retention areas within treatment units are subject to removal as public firewood if accessible. Siegel et al (2013) in their monitoring of black-backed woodpeckers in the Peterson and Wheeler fires on the Lassen and Plumas NFs, respectively, noted woodcutting to be pervasive mostly along open roads of both fires. Thus, public fuelwood gathering is expected to occur immediately along roads in relatively flat areas, along user-created roads, along post-harvest skid trails, meadow edges and other features that allow easy access. As part of the design of this project, retention islands were not placed within about 150 feet of ML2 or greater roads because snags would be considered a safety hazard. Thus retained snag patches would be removed from roadsides and are less accessible. Also, the presence of stumps along roadside corridors discourages lengthy off road travel. Inevitably some retained snags will still be removed by fuelwood harvesters, but most of the fuelwood harvest should be localized to areas that are accessible, as indicated in the Siegel et al (2013) study.

Weller and Zabel (2001) found that fringed myotis roosted in large trees 58.5-167 cm (about 23-66 inches) in diameter, thus the fuelwood diameter restrictions of 20 inches dbh would help retain these larger diameter snags. Thus this activity should not result in a substantial decrease in snags across all the USFS lands involved in the fire.

Determination for Fringed Myotis – Alternative 1

Given the above analysis, it is my determination that the proposed activities within Alternative 1 of the Bald Fire Salvage and Restoration Project may affect individual fringed myotis, but is not likely to result in a trend towards federal listing or loss of species viability.

Fringed Myotis – Alternative 2 – No Action

Direct, Indirect and Cumulative Effects

As discussed previously, fringed myotis and other forest bats have been shown to respond positively to wildfire (Buchalsky et al 2013). Observations of increased bat activity after disturbance (such as timber harvest, thinning or prescribed fire) could be related to decreased amount of clutter in the forest canopy, increased abundance of insect prey, and increased quantity

and/or quality of roost habitat as a result of trees killed or damaged by fire. The Bald Fire advanced all three of the above factors by reducing green tree canopy (clutter), increasing insect abundance associated with vegetation regrowth after the fire, and resulting in thousands of acres of newly burned snags. Buchalsky et al 2013 suggests that an increased abundance of flying insects played an important role in observed increases in bat activity after a mixed-severity wildfire in mixed-conifer forests of the Sierra Nevada. They considered the occurrence of fire on the landscape to be an important process for the maintenance of forest bat communities.

In this No Action Alternative, there would be no substantive reductions in burned forest habitat on USFS lands as a result of management activities. Hazard trees along roads would be subject to being felled and left in place as downed logs as part of normal road maintenance. Such logs and accessible snags would however be subject to being removed as fuelwood by woodcutters. Although firewood gathering would cause a minor reduction in understory vegetation within the localized areas affected, such activity would affect relatively few of the 31,324 burned acres on USFS lands. Nearly all of the burned acres snags would remain until they fell over due to decay and vegetation would go through natural recovery. The factors created by wildfire that result in increased bat activity (reduced canopy clutter, increased insect production and increased snag availability) would all remain unaffected in this alternative, which would sustain these factors in greater amounts and for longer into the future than would Alternatives 1 and Alternative 3.

Given the large patches of high severity fire within the Bald Fire area, the lack of reforestation activities in the No Action would substantially delay a return of forest cover to burned areas that are distant to an existing conifer seed source. There would be a substantial delay in growing a new cohort of bat roost trees within the fire footprint.

Fringed Myotis - Alternative 3 – Road Hazard Tree Removal

Direct and Indirect Effects

As discussed previously, fringed myotis bats have been shown to respond positively to wildfire (Buchalsky et al 2013). Observations of increased bat activity after disturbance (such as timber harvest, thinning or prescribed fire) could be related to decreased amount of clutter in the forest canopy, increased abundance of insect prey, and increased quantity and/or quality of roost habitat as a result of trees killed or damaged by fire. The Bald Fire advanced all three of the above factors by reducing green tree canopy (clutter), increasing insect abundance associated with vegetation regrowth after the fire, and resulting in thousands of acres of newly burned snags. Buchalsky et al 2013 suggests that an increased abundance of flying insects played an important role in observed increases in bat activity after a mixed-severity wildfire in mixed-conifer forests of the Sierra Nevada. They considered the occurrence of fire on the landscape to be an important process for the maintenance of forest bat communities.

In this alternative, hazard trees along roads that are of saw timber size would be felled and removed, and sub-merchantable hazard trees would be felled, piled and burned or left in place. Both activities would cause a minor reduction in understory vegetation within the localized areas affected. Compared to the No Action Alternative 2, the felling and removing as well as potential pile burning would cause a slight reduction in understory vegetation due to the effects of burn piles and the creation of landings for the processing of trees for removal. However such activities would affect approximately 15% (4,736 acres), a small proportion of the 31,324 burned acres on USFS lands. Over the majority of the burned acres snags would remain until they toppled due to decay, and vegetation would go through natural recovery. As a result, the factors created by wildfire that may result in increased bat activity would remain unaffected in this alternative on approximately 85% of the burned area on USFS lands and sustain these factors in greater amounts and for longer into the future than would Alternative 1.

Given large patches of high severity fire within the Bald Fire area, the lack of reforestation activities in untreated areas (approximately 85% of the burn perimeter) would substantially delay a return of forest cover to areas that are distant to an existing conifer seed source. As such, there would be a substantial delay in reestablishing a new cohort of suitable bat roost trees.

Cumulative Effects

The cumulative effects analysis area was as described for Alternative 1.

Personal fuelwood harvest would occur within the Bald Fire footprint on USFS lands. The Lassen NF has one of the most active fuelwood programs in the region, selling over 16,000 cord permits in 2011. This program allows the felling of snags by woodcutters, with upper diameter limits set at 20" dbh for snags of commercial species of conifers, and with no diameter restrictions on lodgepole pine snags. Woodcutters are allowed to travel off road to access snags. Due to woodcutting activity in the fall of 2014 after the fire, including the felling and removal of oversized incense-cedar snags, the fire was signed "closed" until salvage operations were completed. Fuelwood gathering would again be permitted after salvage operations are complete. Snags that are left in retention areas within treatment units are subject to removal as public firewood if accessible. Siegel et al (2013) in their monitoring of black-backed woodpeckers in the Peterson and Wheeler fires on the Lassen and Plumas NFs, respectively, noted woodcutting to be pervasive mostly along open roads of both fires. Thus, public fuelwood gathering is expected to occur immediately along roads in relatively flat areas, along user-created roads, along post-harvest skid trails, meadow edges and other features that allow easy access. As part of the design of this project, retention islands were not placed within about 150 feet of ML2 or greater roads because snags would be considered a safety hazard. Thus retained snag patches would be removed from roadsides and are less accessible. Also, the presence of stumps along roadside corridors discourages lengthy off road travel. Inevitably some retained snags will still be

removed by fuelwood harvesters, but most of the fuelwood harvest should be localized to areas that are accessible, as indicated in the Siegel et al (2013) study.

Determination for Fringed Myotis – Alternative 3

Given the above analysis, it is my determination that the proposed activities within Alternative 3 of the Bald Fire Salvage and Restoration Project may affect individuals of fringed myotis, but is not likely to result in a trend towards federal listing or loss of species viability.

Western Bumble Bee - Alternative 1 – Proposed Action

Direct and Indirect Effects

Management actions or events that increase the diversity and abundance of native flowering plants on the landscape would benefit western bumble bees as well as other pollinator species. The Bald Fire, by causing widespread mortality to forested stands and thus increasing the potential regrowth of flowers as part of the early successional ground vegetation of USFS lands, will result in a greater abundance and variety of flowering plants compared to what existed prior to the fire. This greater abundance and diversity in floral resources should benefit western bumble bees as well as other pollinator species.

In order to preserve the economic value of the wood, salvage harvest is expected to occur quickly after the fire (beginning within one year). During the first spring and early summer relatively little flowering plant life is expected to re-grow prior to harvest, so the presence of western bumble bees across the landscape will be fewer as compared to subsequent years. There may be disturbances to foraging individuals and occasional mortality, but due to the mobile nature of this species and its ability to fly away from mechanical disturbances; direct mortality is expected to be minimal. Similar effects would occur during fuels treatments, but those would be less, considering that a portion of the work is done by hand (fell, lop, scatter).

The activities that have the greatest effect to western bumble bees are related to site-preparation pertaining to reforestation. Site preparation includes the removal of small diameter trees as biomass, mastication, piling and burning, and broadcast burning. These activities result in the intentional reduction of competing ground cover and vegetative litter in order to re-establish forested cover. Site preparation would temporarily reduce the amount of floral resources available to the bumble bee within reforested units. Release of competing vegetation a year or two after the planting also causes a disturbance to and reduction in bumble bee habitat. Such release would occur within a several foot radius of each planted tree where vegetation is removed via hand-grubbing or mastication. Of the 31,324 acres of the Bald Fire on USFS lands, reforestation is proposed on 39% (12,226 acres).

Within salvage and fuels treatment units, 20% of each unit would be left as wildlife retention areas where snags and ground vegetation are retained in their natural condition and reforestation

does not occur. These patches would not be site-prepped or planted, and thus, would remain as bumble bee habitat scattered throughout proposed treatments. Similarly, natural recovery areas make up 54% of the burned USFS landscape and also would not be treated. Over the long term, understory vegetation would re-sprout or seed back into these retention islands and natural recovery areas and bumble bee habitat would eventually reduce to the amount expected across a predominately forested area.

A number of additional measures have been incorporated into the project design for diversity, and should serve to benefit bumble bee habitat. Reforestation with wide spacing, cluster planting and the establishment of founder stands were all designed to retain more understory vegetation within the units planted to these methods. Also, planting densities are lower and trees more widely spaced in areas containing black oaks. Reforestation would not occur within 150 feet of aspen and cottonwood communities on the east, south, and west sides of the community, or 100 feet on the north side to maximize light to the stand and allow for expansion. Reforestation would not occur within 50 feet of the meadow edge, and along stream channels and seasonal wetlands with existing riparian communities. Reforestation of conifer species would not occur within 20 feet of the riparian plant community. All of these strategies serve to retain and promote understory vegetation beneficial to western bumble bees.

Considering that 39% of the fire area on USFS lands would be artificially reforested, versus 54% or more that would undergo natural recovery and thus is expected to have enhanced floral resources, it is expected that an abundance of floral resources would remain available for western bumble bee after project implementation.

Cumulative Effects

The cumulative effects analysis area for this species was expanded from the USFS lands within the fire perimeter to the larger Bald Fire footprint in order to consider activities on non-USFS lands burned by the Bald Fire that are adjacent to USFS lands. This includes 8,200 additional acres, made up of approximately 7,000 acres of BLM, 500 acres State, and 700 acres private. The analysis area was not expanded further because, 1) no spatially-oriented standards and guidelines or LOPs are associated with this species, 2) individuals do not have defined spatial territories that can be mapped or assessed, and, 3) there are no areas adjacent to the Bald Fire area that represent unique habitat opportunities for these species that would warrant expanding the project area to include. On-going projects to be considered within the cumulative effects area include 450 acres of additional salvage and reforest operations on BLM, an assumption that State and private lands would salvage and reforest their burned forests, and fuelwood harvest on USFS lands.

Private timber lands employ a greater array of tools in reducing competing vegetation than does the USFS and BLM, including the use of herbicides. Given more thorough salvage harvest which would result in a greater percentage of ground disturbed by machinery than on USFS lands, tighter spacing of planted trees, and potential use of herbicides to control competing vegetation, floral resources (bumble bee habitat) that remain on the private lands burned by the Bald Fire are expected to be less in both the short and long-term than on those retained on USFS and BLM lands. However, the amount of treated area on non-USFS is minor in comparison. The Forest Service portion of the action maintains substantially more non-forest ground cover vegetation, and will provide the most important bumble bee habitat within the fire perimeter for both the short and moderate term as per project design (as described above under direct and indirect effects).

Private firewood gathering on public lands is an on-going and foreseeable future activity within the cumulative effects area. The effects of this activity after or during the timeframe in which the proposed action is being implemented would not represent a substantive effect to bumble bee habitat because firewood removal doesn't reduce available floral resources. While there may be a minor amount of disturbance or removal of understory vegetation around firewood collection sites, such disturbance or reduction would be very localized (around individual snag sites) and would not reduce the burned acreage available as habitat.

Determination for Western Bumble Bee – Alternative 1

Given the above analysis, it is my determination that the proposed activities within Alternative 1 of the Bald Fire Salvage and Restoration Project may affect individuals of western bumble bee, but is not likely to result in a trend towards federal listing or loss of species viability.

Western Bumble Bee - Alternative 2 - No Action

Direct, Indirect and Cumulative Effects

The Bald Fire, by causing widespread mortality to forested stands, will result in a greater abundance and variety of flowering plants compared to what existed prior to the fire (DellaSalla et al 2014, Swanson et al 2014). As has been found elsewhere (Bogusch et al 2015, Taylor and Catling 2011, Grundel et al 2010), this greater abundance and diversity in floral resources would benefit this species as well as other pollinator species. The No Action does not have any reforestation or site preparation activities therefore the understory that develops naturally would persist within all areas of the fire for a greater duration than compared to the Proposed Action.

Private firewood gathering on public lands is an on-going and foreseeable future activity within the cumulative effects area. The effects of this activity after or during the timeframe in which the proposed action is being implemented would not represent a substantive effect to bumble bee habitat because firewood removal doesn't reduce available floral resources. While

there may be a minor amount of disturbance or removal of understory vegetation around firewood collection sites, such disturbance or reduction would be very localized (around individual snag sites) and would not reduce the burned acreage available as habitat that is being retained.

Western Bumble Bee - Alternative 3 – Road Hazard Tree Removal

Direct and Indirect Effects

Due to the high mobility of this species, and the reduced number of acres being treated, there would be minimal potential for direct impact of project activities to individual bumble bees and fewer effects than in the proposed action. The potential for indirect effects of this alternative to western bumble bees and their habitat would be similar to the No Action alternative because site preparation or reforestation would not occur, and those activities are the primary negative effect to bumble bees and their habitat. Hazard trees along roads would be felled and removed under this alternative. Disturbance to understory vegetation would occur during the harvest along roadside corridors from logging machinery and the creation of landings to temporarily store and process harvested trees. This harvest would occur on approximately 15% (4,736 acres) of the project area. Since no site preparation and reforestation would occur, the effects are expected to be minimal.

Cumulative Effects

The cumulative effects analysis area was as described for Alternative 1.

Personal-use fuelwood harvest would occur within the fire footprint. Because the roadside salvage would remove many of the trees that fuelwood harvesters would potentially access under the No Action, fuelwood harvest would represent less of a cumulative effect under this alternative than the No Action. However there may still be a minor amount of disturbance to or reduction of understory vegetation due to fuelwood harvest as a result of off-road vehicle traffic. Cumulative effects of activities on private timber lands within the Bald footprint would be as discussed within Alternative 1. There would be no substantive cumulative effects of these actions on western bumble bee habitat on USFS lands under this alternative.

Determination for Western Bumble Bee

Given the above analysis, it is my determination that the proposed activities within Alternative 3 of the Bald Fire Salvage and Restoration Project may affect individual western bumble bees, but is not likely to result in a trend towards federal listing or loss of species viability.

V. COMPLIANCE WITH MANAGEMENT DIRECTION

All proposed projects and design standards would adhere to current standards and guidelines of the Lassen NF's LRMP, as amended.

VI. DETERMINATION SUMMARY

1: No Effect on Federally Listed Threatened or Endangered Species

Due to the project area being outside the range of the species, or due to the lack of suitable habitat or habitat components in the project area, it is my determination that the action alternatives would have no effect on the following Federally Listed threatened or endangered species and their critical habitat where designated:

- Gray wolf, northern spotted owl, valley elderberry beetle,

2: May Impact Forest Service Sensitive Species (as specified).

As discussed in the effects section for each of the species listed below, the Action Alternatives would have small effects for the individuals of following species and their habitats. It is my determination that Alternative 1 may impact individuals of the following FS Sensitive species, but is not likely to result in a trend towards federal listing or loss of species viability:

- Northern goshawk, pallid bat, fringed myotis, and western bumble bee⁴

3: No Impact on Forest Service Sensitive Species (as specified).

Due to the project area being outside the range of the species, lack of suitable habitat, unoccupied habitat in the project area, or no effects to existing habitat⁵, it is my determination that the action alternatives would have no effect on the following Forest Service Sensitive species:

- Northern bald eagle, great gray owl, willow flycatcher, California spotted owl, greater sandhill crane, yellow rail, Sierra Nevada red fox, Pacific fisher, American marten, California wolverine, Townsend's big-eared bat, Shasta hesperian snail, and western pond turtle.

⁴ This determination was made and supported previously in the document in the "Effects Section" for each individual species.

⁵ This determination is supported in the "Review of TES for Bald Project" section of the document including Table 1.

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