SUPPLEMENTAL BLACK-BACKED WOODPECKER ASSESSMENT

For

Bald Fire Salvage and Restoration Treatment Project
Lassen National Forest

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Submitted:

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Table of Contents

I. SPECIES AND HABITAT ACCOUNT 3
Status 3
Habitat Account 4
II. CURRENT MANAGEMENT DIRECTION 7
III. EXISTING CONDITION 7
IV. PROJECT DESCRIPTION 10
Considerations Applied to the Action Alternatives 10
Alternative 1 – Proposed Action 11
Hazard Tree Removal 12
Area Salvage Harvesting 12
Area Fuel Treatments 12
Reforestation 12
Alternative 2 – No Action 12
Alternative 3 – Road Hazard Only 13
V. ENVIRONMENTAL CONSEQUENCES 13
Alternative 1 – Proposed Action 14
Direct and Indirect Effects 14
Cumulative Effects 15
Effects Conclusion - Alternative 1: 16
Alternative 2 – No Action 18
Direct, Indirect and Cumulative Effects 18
Effects Conclusion - Alternative 2 – No Action 18
Alternative 3 – Road Hazard Only 19
Direct and Indirect Effects 19
Cumulative Effects 20
Effects Conclusion - Alternative 3: 20
V. Literature Cited 21

I. SPECIES AND HABITAT ACCOUNT

Status

The Black-backed Woodpecker (*Picoides arcticus*) is currently listed as a Management Indicator Species (MIS) representing the ecosystem component of snags in burned forests, as described in the Bald Fire Salvage and Restoration Project MIS report available in the project record. The results of the MIS Report are displayed in the alternative summary tables in order to provide context and comparison with the change in Black-backed Woodpecker Pairs (density) evaluated in this report.

In December 2011, the California Fish and Game Commission accepted for consideration a petition submitted by the John Muir Project and the Center for Biological Diversity (Hanson and Cummings 2010) to list the Black-backed Woodpecker (*Picoides arcticus*) as Threatened or Endangered under the California Endangered Species Act. The Commission's December 15, 2011 action conferred on the species the interim designation of "candidate for listing", effective January 6, 2012, and gave the California Department of Fish and Game (now California Department of Fish and Wildlife, or CDFW) twelve months from that date to review the petition, evaluate the available information, and report back to the commission whether or not the petitioned action is warranted. In May 2013, the Fish and Game Commission found listing the Black-backed Woodpecker as Threatened or Endangered under CESA was not warranted (California Fish and Game Commission 2013).The Commission's conclusion was based on the following summary (California Fish and Game Commission 2013):

- The lack of an apparent range retraction or changes in distribution within the range.
- The episodic cycles of high density occurrences (i.e., prey invasion, high woodpecker productivity, prey decline, and woodpecker dispersal) and the lack of current data on the cycle's impact on the long-term viability of California's Black-backed Woodpecker population.
- The lack of data concerning the role of green forest on the species but its apparent use as habitat.
- The trending increase in fire frequency, size, and severity as compared to the early- and mid-20th century.
- Uncertainty regarding the magnitude of the threat posed to Black-backed Woodpeckers by post-fire salvage logging.
- Lack of logging on approximately 80% of severely burnt USFS forest habitat since 2003 (i.e., 87,200 acres).
- The ongoing long-term monitoring of the species as an MIS.
- Black-backed Woodpecker populations in California are not geographically isolated from populations in adjacent states.

Having considered these factors, the State concluded that listing the Black-backed Woodpecker as threatened or endangered was not warranted.

A number of environmental groups including the John Muir Project, the Center for Biological Diversity, the Blue Mountains Biodiversity Project, and the Biodiversity Conservation Alliance filed a petition (Hanson et al. 2012) to list the Oregon/California and Black Hills (South Dakota) populations of the Black-backed Woodpecker as Threatened or Endangered under the federal Endangered Species Act. The U.S. Fish and Wildlife Service prepared a 90-day finding indicating that the petitioned action may be warranted based on the information provided by the petitioners; therefore when funds become available, they will initiate a review of the status of the two populations to determine if listing is warranted (U.S. Fish and Wildlife Service, 2013).

The IUCN Red List of Threatened Species evaluated the Black-backed Woodpecker as a species of "Least Concern" in 2012 http://www.iucnredlist.org/details/22681181/0. IUCN provided justification for this evaluation as follows: "This species has an extremely large range, and hence does not approach the thresholds for Vulnerable under the range size criterion (Extent of Occurrence < 20,000 km2 combined with a declining or fluctuating range size, habitat extent/quality, or population size and a small number of locations or severe fragmentation). The population trend appears to be stable, and hence the species does not approach the thresholds for Vulnerable under the population trend criterion (>30% decline over ten years or three generations). The population size is extremely large, and hence does not approach the thresholds for Vulnerable under the population size criterion (<10,000 mature individuals with a continuing decline estimated to be >10% in ten years or three generations, or with a specified population structure). For these reasons the species is evaluated as "Least Concern". Nature Serve has ranked this species as G5 = demonstrably secure at the Global level and N4 = apparently secure at the National level (NatureServe.org).

Habitat Account

Black-backed Woodpeckers are distributed in boreal regions from south-central Alaska across Canada to Newfoundland and Nova Scotia, and south in the western United States in Montana and Washington through east-central California. The Black-backed Woodpecker is a monotypic species that occurs at elevations of 4,000-10,000 feet in the Siskiyou, Warner, and Shasta counties, the Sierra Nevada Mountains of California and Nevada south to the southern limits of Tulare County in Sequoia National Forest. Black-backed Woodpeckers are still distributed across their historical breeding range in California (Bond et al. 2012). They have been documented on the Lassen National Forest in burned forest resulting from previous wildfires such as the Sugarloaf and Peterson fires (Siegel et al 2014). The Sugarloaf Fire, which burned in 2009, is located south of the Bald Fire.

Black-backed Woodpeckers are primary cavity excavators, creating holes in trees in which to lay their eggs and raise their young (Dixon and Saab 2000). The breeding season generally occurs from April through July and both sexes incubate, brood, and feed young (Bond et al. 2012). Nest cavities are usually excavated in snags but can be found in dead portions of live trees and in unburned forests. On the Lassen

and Plumas NFs, 21 nest trees were generally medium sized snags that ranged from 23-53 cm dbh (about 9-21 inches), with an average of 33 cm (13 inches) dbh (Siegel et al 2013). Nest trees have occasionally been documented as small as 7" (Bond et al. 2012, Seavy et al. 2012).

Population trends of Black-backed Woodpeckers are poorly known (Bond et al. 2012). Such analyses are especially difficult for this species due to the ephemeral nature of the woodpecker's burned habitat, its tendency not to re-use nesting cavities in subsequent years, and the low density at which the species occurs in unburned forests. Monitoring of the Black-backed Woodpecker across the 10 National Forests in the Sierra Nevada has been conducted in partnership with The Institute for Bird Populations (IBP) (Forest Service 2010a, http://www.birdpop.org/pages/blackBackedWoodpecker.php). The project began with a pilot study in 2008, (Siegel et al. 2008) and has subsequently been implemented fully in 2009-2014 (Siegel et al. 2010, 2011, 2012, 2014a, 2014b and in preparation). Surveys of randomly selected fire areas 1-10 years post-fire have generally yielded Black-backed Woodpecker detections at around half (min = 47% in 2013; max = 75% in 2012) of the fires surveyed, and around 20% of the individual survey points surveyed (Table 1).

During the years of full survey implementation (2009-2013), Black-backed Woodpeckers were detected in fire areas on all ten National Forest units surveyed in 2011 through 2013, and on all National Forest units surveyed except for Sierra National Forest in 2009 and 2010. These data indicate a stable population distribution in the Sierra Nevada in which Black-backed Woodpeckers continue to be distributed across the 10 National Forests in the study area (ranging from the Modoc National Forest in the north to the Sequoia National Forest to the south). A recent report (Siegel et al. 2014) summarizes the MIS monitoring of Black-backed Woodpeckers from 2009-2013 across the ten Sierra Nevada national forests and found that "At this time there is no evidence of a temporal trend in occupancy rates during the five years (2009-2013) we have been monitoring Black-backed Woodpeckers on National Forests in California, or of a broad scale change in the species' distribution in California. Although the distribution of the species appears to change slightly from year to year, Black-backed Woodpeckers remain present across their historic range in California." Data for 2014 are still being analyzed. MIS surveys on the Lassen NF in the past several years have also confirmed Black-backed Woodpecker occupancy in wildfire areas such as the nearby Peterson and Sugarloaf fires.

Table 1 - Number of fires surveyed (each with a transect of 10-20 survey points), fires with Black-backed Woodpecker detections, points surveyed, and points with Black-backed Woodpecker detections during each year of MIS surveys for Black-backed Woodpecker.

Year	No. of Fires Surveyed	No. (Percent) of Fires with Black-backed Woodpecker Detections	No. of Points Surveyed	No. (Percent) of Points with Black-backed Woodpecker Detections
2008[1]	19	10 (53%)	371	68 (18%)
2009	51	28 (55%)	899	169 (19%)
2010	49	29 (59%)	860	132 (15%)
2011	50	24 (48%)	895	148 (17%)
2012	52	39 (75%)	953	207 (22%)
2013	53	25 (47%?)	1008	217 (22%)

[1]Pilot study in which methods differed slightly from methods in subsequent years.

The Black-backed Woodpecker is strongly associated with burned forests, more closely than any other western bird species (Hutto1995, Hutto 2008, Bond et al. 2012). Although the Black-backed Woodpecker is found in unburned forested stands throughout its range, population densities in recently burned forest stands are substantially higher (Hutto 1995, Hoyt and Hannon 2002, Smucker et al. 2005, Hutto 2008, Fogg et al. 2012). Burned forest habitat is most productive for Black-backed Woodpeckers during the first eight years following a fire. Black-backed Woodpecker home-ranges are highly variable. On the Lassen and Plumas NFs, 14 home ranges as estimated by the Brownian bridge kernel method averaged 97 ha (240 acres), but ranged from 24 to 304 ha (59-751 acres) (Siegel et al 2013, Tingley et al 2014a). Snag basal area alone best predicted home-range size, explaining 54 to 62 percent of observed variation (Tingley et al. 2014a). As snag basal area increased, home-ranges exponentially decreased in size, strongly suggesting increased habitat quality.

Black-backed Woodpeckers readily forage on larvae of wood-boring beetles, engraver beetles, and mountain pine beetles found in the trunks of burned conifers (Dixon and Saab 2000). Hanson and North (2008) found preferential foraging on large snags >50 cm (20" dbh) in a study of 3 fire areas in the Sierra Nevada. On the Lassen and Plumas national forests, Black-backed Woodpeckers selected to forage on snags that were larger, more charred, more heavily colonized by wood-boring beetle larvae, and with fewer signs of decomposition than other snags (Siegel et al 2014). The size of snags was the most consistently important variable across the individual Black-backed Woodpeckers monitored, with birds foraging longer on larger snags. Yellow pine snags were the preferred species for foraging and black oaks were avoided (Ibid). In addition, within home ranges Black-backed Woodpeckers did not forage or nest in areas where salvage logging or other post-fire snag removal treatments had occurred (Ibid).

Risk factors to Black-backed Woodpeckers have been summarized in "A Conservation Strategy for the Black-backed Woodpecker (*Picoides arcticus*) in California – Version 1.0":

1. *Salvage logging and other management involving post-fire snag removal*- Management activities commonly employed following wildfire include salvage logging and hazard tree removal have resulted in negative impacts such as reduced abundance and reproductive success in Black-backed Woodpeckers.
2. *Thinning of unburned forests*- Pre-fire forest thinning can decrease post-fire occupancy rates and nest densities of Black-backed Woodpeckers, and thinning or removal of medium and large snags may decrease habitat suitability in unburned forests.
3. *Firewood cutting for personal use in recent fire areas*- Although systematic data on the effects of fuelwood cutting on nesting Black-backed Woodpeckers are not available, small scale harvesting of fuelwood by the public for personal use, from recent fire areas as well as unburned lodgepole pine forests, can destroy active Black-backed Woodpecker nests.
4. *Time since fire*- Probability of occupancy and nesting by Black-backed Woodpeckers in burned forest is negatively correlated with years since fire during the decade after the fire.

5. *Fire Suppression*- Fire suppression may be considered a threat if suppression efforts reduce the amount of mid- and high-severity post-fire habitat available for Black-backed Woodpecker.
6. *Climate change*- Although uncertain, climate change may affect the Black-backed Woodpecker through altered fire regimes and adjustments in distribution.

II. CURRENT MANAGEMENT DIRECTION

The Lassen NF LRMP, as amended, does not contain specific management direction for Black-backed Woodpeckers. However, with regards to post-fire salvage, the LRMP as amended does direct that in large catastrophic fires (contiguous blocks of moderate to high fire lethality of 1,000 acres or more) do not conduct salvage harvest in at least 10% of the total area affected by fire (USDA 2004 p. 52).

Management recommendations for Black-backed Woodpeckers were included within the Conservation Strategy for the Black-backed Woodpeckers in California (Bond et al 2012). The Conservation Strategy for Black-backed Woodpecker is not a legally binding or regulatory document or agency policy. Also, it was not designed to constrain the FS in its actions and activities. It seeks to summarize known information about the species, recommends management approaches for conservation, and suggests future research priorities (Bond et al. 2012). By its very nature, the Black-backed Woodpecker Conservation Strategy considers only one species which is contrary to the Forest Service objective of balancing multiple priorities, objectives, uses, and species management. At times, certain management objectives are in tension, if not direct conflict, with one another. For example, the purpose and need of the Bald Project includes capturing the economic value of fire-killed trees. Yet, the Forest also wishes to conserve burned forest habitat for the Black-backed Woodpecker and other species. The Forest has tried to strike a reasonable balance between these two goals at the landscape level, realizing it is not possible to fully achieve both of these goals on each and every acre.

III. EXISTING CONDITION

The Hat Creek Ranger District (HCRD) lies at the southern end of Cascade mountain range in northeast California. Prominent features within the Bald Project area include Beaver Creek which runs north and south through the project area. The predominant vegetative cover is eastside pine with small amounts of mixed conifer and lodgepole pine at the higher elevations, and shrublands and grasslands at lower elevations. The following table shows the vegetative categories present within the Forest Service portion of the burn perimeter and how they were affected by the fire.

Table 2 - 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%

USFS Cover Type	Pre-fire Acres	Post-fire Acres	Pre-fire % Cover	Post-fire % Cover	Change in Cover Type
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-Herbaceous	7,672	1,328	24%	4%	-20%
Barren (rock, gravel, soil)	**631**	**25,305**	2%	81%	+79%
Total Project Area	31,324	31,322	100%	100%	

The primary change in the landscape because of the Bald 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 suitable to Black-backed Woodpeckers.

As measured by estimated basal area mortality, the total acres and percent of forested acres burned in each severity category were as listed below.

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%

These identified acres do not specifically represent Black-backed Woodpecker habitat, but give an indication of the large amount of potential habitat created after the fire. While all of the burned area may serve to benefit Black-backed Woodpeckers to some extent, it is those areas that burned with moderate to high mortality, and had higher basal areas, that serve as the most valuable to the woodpecker. In order to compare alternatives and potential effects to Black-backed Woodpeckers, we used a model developed by Tingley et al (2014b) that was applied specifically to burned forest within the Bald Fire perimeter. This model presents a method for predicting changes in Black-backed Woodpecker pair density assuming occupancy. Suitable Black-backed Woodpecker habitat as defined for this project included forested stands characterized by California Wildlife Habitat Relationship (CWHR) tree size classes 3, 4 and 5, with densities of M and D, of all CWHR coniferous forest types found in the Bald Fire, and basal area loss resulting from the fire of greater than or equal to 50% (Tingley 2014b). The Tingley model assumes that a Black-backed Woodpeckers homerange size varies depending on the quality of habitat present. For example, a woodpecker pair with a homerange in lower quality habitat would need a larger area to be successful compared to a woodpecker pair with a homerange in high quality habitat, which needs a smaller area to be successful. The Tingley model estimates the varying quality of habitat among the separate 30x30 meter parcels, then sums the area of those parcels across the landscape, in order to estimate the relative number of Black-backed Woodpecker pairs that can be supported in the project area. The Tingley model includes a thorough dataset based on detailed remote sensing satellite imagery. Habitat evaluation occurred on a 30x30 meter scale, and estimates of habitat quality were also generated on BLM, State, and private lands. The authors caution that the expected density of woodpeckers should not be misconstrued as known density. While the model predicts certain number of pairs would be supported by the different alternatives, the true numbers may be either higher or lower to an unknown degree. The model was utilized to examine and compare the relative effects of proposed alternatives on predicted number of Black-backed Woodpecker pairs. The model predicted a total of 98 pairs of Black-backed Woodpeckers could be supported within burned forest habitat of the total Bald Fire area, made up of 95 pairs on USFS lands, two pairs on BLM lands and one pair on private lands.

In addition to the Tingley modeling, the Bald Fire MIS Report also estimated suitable Black-backed Woodpecker habitat based on GIS modeling. MIS generated habitat data is presented in the tables below

along with the Tingley pair/density results for comparison purposes. The MIS report is more simplistic than the Tingley model because the data does not consider varying quality of habitat and is measured at the forest stand scale (rather than 30x30 meter pixels) The MIS modeling calculates mature conifer stands (prior to the fire), with moderate to high tree density, where greater than or equal to 50% tree mortality occurred from the fire. This calculation yields an approximate number of burned acres across the landscape that are suitable as burned snag habitat for Black-backed Woodpeckers and other wildlife species. The MIS data-set is incomplete for adjacent BLM, State, and Private Lands. Since BLM, State, and private lands make up a small portion of the burn perimeter and much of those lands are drier and non-conifer forest, the incomplete vegetative data does not inhibit the comparison of trends across the cumulative effects landscape.

Table 3 - Summary of Black-backed Woodpecker Habitat (based on MIS Report) and Relative Potential Number of Pairs (based on Tingley Model results) within the Bald Fire Perimeter.

Ownership	Total Acreage in Fire Perimeter listed by ownership	Acres of burned snags as Black-backed Woodpecker (BBWO) Habitat according to MIS Modeling	BBWO Pairs Supported according to Tingley Model
U.S. Forest Service	31,324	5,769	95
Bureau of Land Management	7,000	Unavailable/incomplete	2
State and Private Lands	1,200	Unavailable	1

IV. PROJECT DESCRIPTION

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.

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).

- In a proactive measure to conserve additional Black-backed Woodpecker habitat, a portion of four proposed harvest units were dropped from the action alternatives. This design change equated to conservation of additional habitat that could support approximately nine Black-backed Woodpecker pairs, over approximately 1,261 acres. These salvage and fuels treatment units were dropped from the original proposal because they provided large contiguous acreage of quality habitat.
- 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.

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 4 - Summary of Activities in Alternative 1 - Proposed Action.

Alternative 1	Estimated Acres	Percent of USFS 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-affected 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 reburn. 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 reforestation would occur. Current management practices such as road maintenance and fire suppression would continue.

To protect public safety, burned hazard trees along roads may be felled as part of road maintenance. These hazard trees would be felled and left in place.

Alternative 3 – Road Hazard Only

To respond to concerns raised during public scoping, the Responsible Official has proposed an alternative 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.

V. ENVIRONMENTAL CONSEQUENCES

This analysis is focused on the project effects related to management of burned forest. Project alternatives would result in direct and indirect effects to the Black-backed Woodpecker through the removal of fire-killed trees, including roadside hazard trees. Such tree removal could have direct and indirect effects on Black-backed Woodpeckers due to project-related death, injury or disturbance, and project-related modifications to habitat quantity or quality.

In this report, the primary measurement for project scale direct and indirect effects to the Black-backed Woodpecker is changes in pair density based on the Tingley model (Tingley, 2014b). The relative changes in pair density between alternatives documents how consistent the project alternatives are with this species' conservation strategy recommendations. The model estimates the number of Black-backed Woodpecker pairs predicted within the project area and how many would remain if action alternatives are implemented. This estimate of Black-backed Woodpecker pairs does not represent the actual number of birds present, however it has been found to accurately predict the relative number of birds present in an area, and expected changes based on the availability of burned habitat that remains after salvage or removal. While this analysis predicts the potential effects to the Black-backed Woodpecker within the project area, the Bald Fire Management Indicator Species (MIS) Report (prepared separately) analyzes how project-level impacts affect Black-backed Woodpeckers at a bioregional scale and trend. The results of the MIS report are presented in the "Summary of Effects" alternative tables in order to provide context and comparison between the two analyses. Acreages used between the two analyses may vary slightly due to rounding of data figures and minor corrections made to databases during the analysis process. However, trends and estimates of effects would remain accurate as reported unless otherwise mentioned.

Alternative 1 – Proposed Action

Direct and Indirect Effects

Although direct death or injury to adult birds would be unlikely to occur given the mobility of this species there is the potential for death or injury to young or eggs if a nest tree were felled while being used by Black-backed Woodpeckers. These potential direct effects would be considered short term (since birds can re-nest) and uncommon (because nest trees are uncommon). Harvesting of fire-killed trees may occur throughout the year including the many months that are outside the Black-backed Woodpecker breeding season approximately April through July.

Wildlife retention islands would be identified that retain all snags within approximately 20% of each treatment unit and would continue to provide some cavity and foraging habitat available to the woodpecker.

Project activities such as loud noise and mechanical equipment result in disturbance that may temporarily impair behavior patterns of the Black-backed Woodpeckers related to breeding or foraging. Loud noise from equipment such as chainsaws or tractors is expected to occur primarily in salvage units, along project roads, and at landings where trees are processed. Any woodpecker displacement or avoidance related to noise disturbance would be of short duration and would subside shortly after project implementation activities. Black-backed Woodpeckers have been shown to naturally abandon habitat after each given season of occupancy, and then re-colonize habitat in subsequent years as part of a constantly shifting population (Siegel et al, 2014) Therefore, the risk of noise and project disturbances permanently displacing Black-backed Woodpeckers for multiple seasons or years is unlikely.

A substantial amount of untreated areas (54% of USFS project area) contain suitable Black-backed Woodpecker habitat. These areas would be left intact, providing nesting and foraging habitat for Black-backed Woodpeckers that would be undisturbed by project activities. These untreated acres support approximately 43 Black-backed Woodpecker pairs according to the results of the Tingley model.

The removal of hazard trees along Maintenance Level 2 roads would remove and reduce the amount of suitable Black-backed Woodpecker habitat by harvesting burned snags the species require for breeding and foraging. The proposed action would remove hazard trees within 15% of the project area. In these roadside corridors most or all snags would be removed and there would be no designed snag retention in order to maintain a safe travel corridor along open roads. While some smaller diameter snags that do not represent hazards to the adjacent roads may be retained within these roadside corridors, this treatment would effectively result in the loss of all Black-backed Woodpecker habitat within those units.

Proposed in this alternative are 12% (3,632 acres) of the Bald Project area as commercial salvage removal and 18% (5,499 acres) as fuels reduction treatments. These units contain Black-backed Woodpecker habitat, with salvage units generally containing better quality habitat because of the higher basal area present in economically viable stands. Fuels treatments are generally in locations that lacked sufficient saw-timber sized trees to support a commercial timber sale unit, thus fuels treatments generally contain lower quality woodpecker habitat due to smaller or sparser trees which often equates to reduced

basal area. For the purposes of the Tingley modeling, all Black-backed Woodpecker habitat within salvage and fuels treatment units was assumed to be 'lost' as suitable habitat. However, within salvage and fuels treatment units, approximately 20% of potential habitat would be minimally affected since 20 percent of treatment units are kept as wildlife retention islands and would remain as untreated patches. This equates to an additional 1,800 acres of potential Black-backed Woodpecker habitat within treatment units that would remain in its existing condition relative to snag densities and potentially continue to provide available habitat. These retention areas will not be modeled as suitable habitat since they are smaller patches and may be discontinuous, so their effectiveness as habitat is unknown. However, it should be noted that they will provide available habitat that is not being modeled and thus, the Tingley model will estimate a slightly greater impact on the number of pairs affected than would actually occur.

Reforestation is proposed on 39% (12,200 acres) of the USFS lands burned in the Bald Fire. Most of the reforestation would occur on acreages that have been treated through salvage or fuels removal, so have already been modeled as "lost" as Black-backed Woodpecker habitat. An additional 417 acres is also being reforested but would not negatively affect woodpeckers. As such, reforestation itself would not represent an impact to Black-backed Woodpecker habitat. While some snags may have to be felled for worker safety during the reforestation efforts, such felling should not be sufficient to substantively degrade woodpecker habitat.

The Tingley model predicted that USFS lands in the Bald Fire can support approximately 95 Black-backed Woodpecker pairs (prior to treatment). Data indicates that the proposed action would reduce the habitats ability to support woodpeckers by approximately 53% according to the Tingley model, retaining enough habitat to support about 43 Black-backed Woodpecker pairs on USFS lands that were deferred from treatment (such as natural recovery and reforestation only areas).

Cumulative Effects

The cumulative effects analysis area was expanded from USFS lands within the Bald Fire to include the entire Bald Fire footprint, which is approximately 8,200 additional acres, made up of approximately 7,000 acres of BLM, 500 acres State, and 700 acres private. Most of these lands are drier with smaller trees and more shrublands than is present on USFS lands, thus large expanses of suitable Black-backed Woodpecker habitat are not present. 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.

The Bald Fire burned a total of 31,324 acres on USFS lands, which is 79% of the total burned acres (the remaining being BLM, State, and private ownership as described above). The Tingley model predicts that BLM lands provide habitat for two Black-backed Woodpecker pairs while the state and private lands together provide habitat for one pair. BLM is proposing only a small amount of salvage and Tingley modeling indicates that it would still retain habitat for the existing estimate of two pairs. It is assumed that State and private lands would salvage log all available habitat resulting in the estimated loss of habitat for approximately one Black-backed Woodpecker pair.

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 drive 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. Firewood harvest has been identified as a risk factor for Black-backed Woodpeckers (Bond et al 2012).

Fuelwood harvest would primarily occur immediately along roads, as well as in relatively flat areas that allow off-road travel, along user-created roads, post-harvest skid trails, meadow edges or other features that allow off-road travel. As part of the design of this project, snag retention clumps were not placed within about 150 feet of ML2 or greater roads where snags would be considered as hazards. Thus retained snag patches would be distant from roadsides and should be less accessible. The presence of stumps along roadside corridors may also make off road travel difficult. 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 fuelwood gathering, then it is reasonable to conclude that fuelwood gathering would not result in a substantial decrease in burned forest habitat and associated snags across the lands involved in the fire.

Effects Conclusion - Alternative 1:

Table 5 - Alternative 1, Summary of Effect to Black-backed Woodpeckers and their Habitat. -

Treatment	Acreage Proposed	Acres of burned snags as Black-backed Woodpecker (BBWO) Habitat according to MIS Modeling	BBWO Pairs Affected according to Tingley Model	The Percent of BBWO Pairs affected (positively or negatively).
No Treatment/Natural Recovery	16,961	2,121	43 Pairs (retained)	+44%
Fuels Treatment	5,499	1,523	52 Pairs (reduced)	-53%
Salvage	3,632	1,903		
Roadside Hazard Only	4,815	222		
Cumulative Effects Area (BLM, State,	a) BLM 450 acres salvage, but not	Not Modeled	2 Pair (retained)	+2%

Private)	part of USFS proposed action. b) Assumes all State and private habitat being treated.		1 Pair (reduced)	-1%

Based on the Tingley model, sufficient habitat exists prior to treatment in the Bald Fire area to support 95 Black-backed Woodpecker pairs on USFS lands, and 98 pairs within the cumulative effects area.

In a proactive measure to conserve Black-backed Woodpecker habitat, a portion of four proposed harvest units were dropped from the action alternatives by design. This design change equated to conservation of habitat that could support almost nine Black-backed Woodpecker pairs. These salvage and fuels treatment units were dropped from the original proposal because they provided large contiguous acreage of quality habitat.

Data indicates that the proposed action would reduce the habitats ability to support woodpeckers by approximately 53% according to the Tingley model, retaining enough habitat to support about 43 Black-backed Woodpecker pairs on USFS lands that were deferred from treatment (such as natural recovery and reforestation only areas). BLM is proposing 450 acres of salvage, a small amount that equates to less than 10% of their ownership in the burn perimeter. The results of the Tingley model indicated that the proposed BLM salvage is not expected to reduce the number of woodpecker pairs. It is assumed that State and private landholders within the Bald Fire burn perimeter would salvage all or most available burned habitat on those lands which support one Black-backed Woodpecker pair. Therefore, regarding cumulative effects, of three Black-backed Woodpecker pairs modeled on BLM, State, and private lands, habitat for two pairs would be retained, and habitat for one pair would be lost.

In summary, of the 98 modeled Black-backed Woodpecker pairs within the fire perimeter, activities on USFS lands would reduce the habitat affecting 52 pairs, and it is assumed activities on adjacent lands would reduce habitat affecting one pair. Habitat would be retained across the entire area that can support an estimated 45 Black-backed Woodpecker pairs which is 46% of those estimated to be present.

Using the Tingley model, all habitat within salvage and fuels treatment units were assumed to be ‘lost’ as Black-backed Woodpecker habitat. However, approximately 20% of each treatment unit within these salvage and fuels units on USFS lands would be minimally affected since they are kept as wildlife retention islands and would remain as untreated patches. This amounts to 1,800 acres within treatment units that would remain in existing condition relative to snag densities and continue to provide some additional available habitat to Black-backed Woodpeckers.

Alternative 2 – No Action

Direct, Indirect and Cumulative Effects

Under the No Action alternative, none of the activities proposed under Alternative 1 would be implemented. No fuels treatments, site preparation, or reforestation would occur. Current management practices such as road maintenance and fire suppression would continue. There may be some losses of burned forest habitat on USFS lands as a result of hazard tree felling along road corridors conducted as part of road maintenance. Logs would be left in place and only trees that provide direct safety hazards would be felled. A number of smaller diameter trees within these corridors that do not represent hazards would remain. In addition, personal fuelwood harvest would take place along roads and is one of the cumulative effects to consider. Fuelwood harvest is most prevalent along roads and in this alternative, a larger number of burned trees may be available since they would not be harvested prior. The combined cumulative effect of hazard tree abatement and fuelwood harvest would likely result in patchy removal of burned forest habitat along 150 feet on each side of the road corridor. Although the actual removal from road maintenance and firewood is expected to be patchy, a maximum treatment estimate is used that assumes woodpecker habitat could be fully lost along various sections of the road corridor. Therefore, it is assumed that habitat within the 4,736 acres of burned forest would be considered 'mostly-lost' as Black-backed Woodpecker habitat under the no action alternative. This loss amounts to a modeled maximum 15 percent reduction in the ability to support woodpeckers, which is similar to losses in Alternative 3. The difference is that habitat losses in this, the No Action alternative, may be less substantial since the observed condition of remaining burned forest along road corridors will be patchier than in the Action Alternatives and retained vegetation would provide an unknown quantity of Black-backed Woodpecker habitat.

Given the large patches of high severity fire within the Bald Fire, the lack of reforestation activities of the No Action would substantially delay a return of forest cover to burned areas that are distant to an existing conifer seed source. As such, there would be a substantial delay in achieving a new cohort of trees and thus future forested habitat for this species.

The Tingley model predicts habitat would remain across the Bald Fire footprint to support 80 pairs on USFS lands with an additional two pairs on BLMS lands.

Effects Conclusion - Alternative 2 – No Action

Table 6 - Alternative 2, Summary of Effect to Black-backed Woodpeckers and their Habitat.

Treatment	Acreage Proposed	Acres of burned snags as Black-backed Woodpecker (BBWO) Habitat according to MIS Modeling	BBWO Pairs Affected according to Tingley Model	The Percent of BBWO Pairs affected (positively or negatively).

No Treatment/Natural Recovery	26,092	2,121	80 Pairs (Habitat fully retained)	+82%
Fuels Treatment	0	1,523		
Salvage	0	1,903		
Roadside Hazard Only	Potentially up to 4,815 acres treated through road mtc., Fell, lop, scatter.	222	Up to 15 Pairs (Habitat lost)	-15%
Cumulative Effects Area (BLM, State, Private)	a) BLM 450 acres salvage, but not part of USFS proposed action. b) Assumes all State and private habitat being treated.	Not Modeled	2 Pair (Habitat fully retained) 1 Pair (Habitat lost)	+2% -1%

Based on the Tingley model, sufficient habitat exists in the Bald Fire area to support 98 Black-backed Woodpecker pairs, including 95 pairs predicted to be supported on USFS lands, and three pairs on BLM, State, and private lands. As was described previously, it is assumed that State and private ownership will salvage harvest all of their burned habitat while the BLM will salvage only a small percentage, resulting in the total loss of one Black-backed Woodpecker pair on non-USFS lands within the Bald Fire footprint.

Along roadways, abatement of fire-killed snags that present safety hazards along with projected firewood harvest over the next several years would result in the patchy removal of snags on about 4,736 acres, some of which is Black-backed Woodpecker habitat. The Tingley model predicts that habitat to support 15 pairs of Black-backed Woodpeckers may be mostly-lost on USFS lands and habitat for one pair would be lost on adjacent State and private lands. Habitat would remain to support 82 pairs of woodpeckers (80 on USFS and two on BLM) within the total Bald Fire perimeter, indicating that habitat would remain at 84 percent of the current condition.

Alternative 3 – Road Hazard Only

Direct and Indirect Effects

In this alternative, hazard trees that are of sawtimber size would be felled and removed within 4,736 acres located along road corridors, and sub-merchantable hazard trees would be piled and burned or felled

and left in place. This change would occur on approximately 15 percent of the USFS acreage burned in the Bald Fire. Compared to the No Action alternative, the removal of burned habitat available to woodpeckers within these road corridors would be more complete due to commercial removal.

Given the large patches of high severity fire within the Bald Fire, the lack of reforestation activities would substantially delay a return of forest cover to burned areas that are distant to an existing conifer seed source. As such, a there would be a substantial delay in this alternative in achieving a new cohort of trees that produce forested habitat for this species.

As in Alternative 2, the Tingley model estimated that about 15 pairs would have been supported on these 4,736 acres. With this reduction, the Tingley model predicted the remaining burned forest on USFS lands would support 80 pairs of Black-backed Woodpeckers, which is 84% of the 95 pairs estimated to be supported on USFS lands.

Cumulative Effects

The cumulative effects analysis area is the same as is described for Alternatives 1 and 2.

BLM is proposing 450 acres of salvage, a small amount that equates to less than 10% of their ownership in the burn perimeter. Tingley modeling indicates that BLM salvage is not expected to reduce the number of woodpecker pairs. It is assumed that State and private landholders within the Bald Fire burn perimeter would salvage all or most available burned habitat on those lands which support one Black-backed Woodpecker pair. Therefore, regarding cumulative effects, of three Black-backed Woodpecker pairs modeled on BLM, State, and private lands, habitat for two pairs would be retained, and habitat for one pair would be lost.

Fuelwood harvest would primarily be immediately along roads in relatively flat areas that allow off-road travel, along meadow edges or other features that allow off-road travel. Inevitably some retained snags will likely be removed by fuelwood harvesters. Due to the proposed removal of hazard trees along roads, the majority of the snags that would be accessible to woodcutters would already be removed in this alternative, so this activity should not result in a substantive cumulative effect.

Forest regeneration would be expected to take much longer than in the proposed action since planting would not occur and in many locations a conifer seed source is not present because of high intensity fire. Therefore, over the long term, habitat for Black-backed Woodpeckers would take decades longer to develop than would occur in the proposed action.

Effects Conclusion - Alternative 3:

Table 7- Alternative 3, Summary of Effect to Black-backed Woodpeckers and Their Habitat.

Treatment	Acreage Proposed	Acres of burned snags as Black-backed Woodpecker (BBWO) Habitat	BBWO Pairs Affected according to Tingley Model	The Percent of BBWO Pairs affected (positively or

		according to MIS Modeling		negatively).
No Treatment/Natural Recovery	26,092	2,121	80 Pairs (Habitat fully retained)	+82%
Fuels Treatment	0	1,523		
Salvage	0	1,903		
Roadside Hazard Only	4,815	222	15 Pairs (Habitat lost)	-15%
Cumulative Effects Area (BLM, State, Private)	a) BLM 450 acres salvage, but not part of USFS proposed action. b) Assumes all State and private habitat being treated.	Not Modeled	2 Pair (Habitat fully retained) 1 Pair (Habitat lost)	+2% -1%

Based on the Tingley model, sufficient habitat exists in the Bald Fire area to support 98 Black-backed Woodpecker pairs comprised of 95 pairs on USFS lands, and three pairs on BLM, State, and private lands within the cumulative effects area.

Road-side hazard tree removal would eliminate habitat for approximately 15 pairs of Black-backed Woodpeckers on USFS lands. Firewood removal would, for the most part, duplicate the areas already harvested along roads, so would not measurably contribute additional losses of Black-backed Woodpecker habitat. Predicted salvage on BLM, State and private lands would remove habitat for one pair. Therefore, habitat would remain in Bald Fire footprint to support 82 pairs of Black-backed Woodpeckers (80 on USFS and two on BLM) within the total Bald Fire perimeter, which is 84% of the current condition. Compared to the No Action alternative, the removal of burned habitat available to woodpeckers within these road corridors would be more complete due to commercial tree removal.

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