

Memorandum

Date: February 15, 2011

To: Jon Fisher
Acting Executive Director
Fish and Game Commission

From: John McCamman
Director
Department of Fish and Game

Subject: Petition from the John Muir Project of Earth Island Institute and Center for Biological Diversity to List the Black-backed Woodpecker under the California Endangered Species Act

The Department of Fish and Game (Department) prepared the attached petition evaluation report in response to a petition, dated September 29, 2010, received by the Fish and Game Commission (Commission) on October 1, 2010 (Petition), and from the John Muir Project of Earth Island Institute and Center for Biological Diversity, to list the black-backed woodpecker (*Picoides arcticus*) as a threatened or endangered species under the California Endangered Species Act (CESA). (See generally Fish and Game code §2073.5, subd. (a); Cal Code Regs., title 14, §670.1, subd. (d)(1).)

In accordance with CESA, the attached petition evaluation report delineates the categories of information required in a petition, evaluates the sufficiency of the information in the Petition, and incorporates additional relevant information that the Department possessed or received during the review period. Based upon the information contained in the Petition, the Department has determined that there is not sufficient information to indicate that the petitioned action may be warranted. The Department recommends that the Petition be rejected.

If you have any questions or need additional information, please contact Sonke Mastrup, Deputy Director, Wildlife and Fisheries Division at 916 653-4673 or Eric Loft, Chief, Wildlife Branch at 916 445-3555.

Attachment

STATE OF CALIFORNIA
NATURAL RESOURCES AGENCY
DEPARTMENT OF FISH AND GAME

REPORT TO THE FISH AND GAME COMMISSION

EVALUATION OF PETITION
FROM
JOHN MUIR PROJECT OF EARTH ISLAND INSTITUTE
AND
CENTER FOR BIOLOGICAL DIVERSITY
TO LIST
BLACK-BACKED WOODPECKER
(Picoides arcticus)
AS THREATENED OR ENDANGERED

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February 11, 2011

REPORT TO THE FISH AND GAME COMMISSION

EVALUATION OF PETITION
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INTRODUCTION

On October 1, 2010, the Office of the California Fish and Game Commission (Commission) received the "Petition to the State of California Fish and Game Commission to list the Black-backed Woodpecker (*Picoides arcticus*) as threatened or endangered under the California Endangered Species Act" (September 29, 2010)(hereafter, the Petition), as submitted to the Commission by the John Muir Project of Earth Island Institute and Center for Biological Diversity (Petitioners). The Commission, as established by the California Constitution, is vested with exclusive statutory authority under California law to designate endangered, threatened, and candidate species under the California Endangered Species Act (CESA). (Cal. Const., art. IV, § 20, subd. (b); Fish & G. Code, § 2070; see also Fish & G. Code, §§ 2062, 2067, 2068 (endangered, threatened, and candidate species defined).) The Commission, pursuant to this authority, may add, remove, uplist or downlist any plant or animal species to the list of endangered or threatened species, or designate any such species as a candidate for related action under CESA. (See generally Cal. Code Regs., tit. 14, §§ 670.1, subd. (i)(1)(A)-(C), 670.2, 670.5.) Commission staff transmitted the Petition to the Department pursuant to Fish and Game Code section 2073 on October 11, 2010, and the Commission published formal notice of receipt of the Petition on October 29, 2010 (Cal. Reg. Notice Register Z2010-1019-11)

The Department has prepared this Evaluation Report pursuant to Fish and Game Code section 2073.5. (See also Cal. Code Regs., tit.14, § 670.1. subd. (d).) This section of the Fish and Game Code and related regulatory authority direct the Department to prepare and submit to the Commission an initial evaluation of any petition deemed complete by the Commission, as an initial matter, to add or remove any species to the list of species designated by the Commission as threatened or endangered under CESA (Fish & G. Code, § 2050 et seq.).¹

¹ See, e.g., Cal. Code Regs., tit. 14, 670.1, subd. (b) (governing initial review by the Commission as to whether a petition is complete).

Fish and Game Code section 2073.5 directs the Department to complete its initial evaluation of a CESA listing petition within 90 days of receipt of the petition. Subdivision (b) of the same section also authorizes the Commission to grant the Department an extension not to exceed 30 days to allow the Department additional time to further analyze and evaluate the petition, and complete the evaluation report. The Department's Director made such a request to the Commission in the present case on October 27, 2010. The Commission granted the Department's request for an extension to complete this Evaluation Report at a meeting in Sacramento, California, on February 4, 2011.

REGULATORY OVERVIEW

CESA's Candidacy Evaluation Test and the Commission's Related Determination

In general, Commission "Listing of Endangered Species" under CESA is governed by Division 3, Chapter 1.5, Article 2, of the Fish and Game Code, commencing with section 2070. A related regulation is found in Title 14, section 670.1, of the California Code of Regulations. The CESA listing process is also described in published appellate California case law, including *Center for Biological Diversity v. California Fish and Game Commission* (2008) 166 Cal.App.4th 597, 600 (hereafter *CBD*); *California Forestry Association v. California Fish and Game Commission* (2007) 156 Cal.App. 4th 1535, 1541-1542; and *Natural Resources Defense Council v. California Fish and Game Commission* (1994) 28 Cal.App.4th 1104, 1111-1116 (hereafter *NRDC*). The published appellate decision providing the most detailed overview of the CESA listing process describes Commission listing of species as a two-step process:

"In the first step the Commission determines whether a species is a candidate for listing by determining whether the petition – when considered with the Department's written report and the comments received – provides sufficient information to indicate that the endangered or listing 'may be warranted.' If this hurdle is cleared, the petition is 'accepted for consideration' and the second step begins: the Department conducts a (roughly) year-long scientific based review of the subject species, reports to the Commission, and then the Commission determines whether listing of the candidate as an endangered or threatened species 'is [or] is not warranted.'" (*NRDC*, 28 Cal.App.4th at pp. 1114-1115.)

The Commission, in the present case, is at the first step of the CESA listing process for the Black-backed Woodpecker (BBWO) listing Petition. This Evaluation Report is focused on the same first step, intended by law to inform the Commission's related determination as to whether the Petition, when considered with this Evaluation Report and other related information before the Commission,

provides sufficient information to indicate the petitioned action may be warranted. (See generally Fish & G. Code, §§ 2073.5, 2074.2; Cal. Code Regs., tit. 14, § 670.1, subds. (d), (e).) This first step is sometimes referred to as the “for consideration” stage in the Commission listing process and the standard governing the Commission’s related determination at this first stage is sometimes referred to as the candidacy evaluation test. (See, e.g., *CBD, supra*, 166 Cal.App.4th at p. 610.) Should the Commission determine at a noticed public meeting that the Petition provides such sufficient information, the Commission will “accept” the Petition for further review, designating BBWO as a candidate species protected under CESA following publication of related notice to that effect. (Fish & G. Code, §§ 2074.2, subds. (a)(2), (b), 2074.4, 2080, 2085; Cal. Code Regs., tit. 14, § 670.1, subd. (e)(2).)

The candidacy evaluation test governing the Commission’s determination at this first step in the CESA listing process is the subject of two appellate decisions from California’s Third District Court of Appeal. The first decision, *NRDC, supra*, 28 Cal.App.4th 1104, addresses in detail the statutory language in the Fish and Game Code governing the candidacy evaluation test. (See, e.g., *Id.* at pp. 1108-1109.) The second decision, *CBD, supra*, 166 Cal.App.4th 597, elaborates on *NRDC*, addressing the candidacy evaluation test specifically in the context of a Commission decision to reject a petition for further consideration after determining there was not sufficient information to indicate that the petitioned action may be warranted. (*CBD, supra*, 166 Cal.App.4th at pp. 599-600.)

In *NRDC*, the Court of Appeal interpreted the statutory language regarding Commission determinations as to whether a petition contains “sufficient information to indicate that the petitioned action may be warranted.” (Fish & G. Code, § 2074.2, subd. (a); see also Cal. Code Regs., tit. 14, § 670.1, subd. (e).) In so doing, the court interpreted the standard to mean “that amount of information – when considered in light of the [Department’s] written report and comments received – that would lead a reasonable person to conclude there is a ‘substantial possibility’ the requested listing ‘could’ occur[.]” (*NRDC, supra*, 28 Cal.App.4th at pp. 1108-1109 (internal citations omitted).) In other words, the court concluded that, if a reasonable person reviewing the petition would conclude that listing could occur, the Commission must accept the petition and designate the species as a candidate for listing under CESA. Based on other “guideposts” offered by the court, while the Commission must find more than a reasonable possibility of listing to designate a species as a candidate, it need not find a reasonable probability of such a future listing at this first step in the CESA listing process. (See *Id.* at pp. 1119-1125.)

Importantly, the *NRDC* decision emphasizes that Commission determinations at this first step in the CESA listing process must be based on scientific information, including the species’ population trend, range, distribution, abundance, life history, habitat requirements, nature of threats to its existence, impact of future management actions, management recommendations, sources of information

regarding the species, and a distribution map. (See, e.g., Fish & G. Code, § 2072.3; Cal. Code Regs., tit. 14, § 670.1, subds. (d), (e).) Stated another way, the *NRDC* decision emphasizes the Commission must determine at this first step whether the petitioned action may be warranted based on biological information in the petition or as otherwise available, and not on non-biological factors such as potential economic consequences of the petition's acceptance. Indeed, as the Third District Court of Appeal concluded, Commission candidacy determinations under CESA must "be based on science not economics." (*NRDC, supra*, 28 Cal.App.4th at p. 1117, fn. 11.)

The *CBD* decision adds important detail regarding the candidacy evaluation test governing the Commission's first step in the CESA listing process. The Court of Appeal affirmed its earlier, related decision in *NRDC*, emphasizing the term "sufficient information" in Fish and Game Code section 2074.2 means that amount of information that would lead a reasonable person to conclude the petitioned action may be warranted; that the phrase "may be warranted" is appropriately characterized as a "substantial possibility that listing could occur"; and that "substantial possibility" means something more than a reasonable possibility, but that it does not require that listing is more likely than not. (*CBD, supra*, 166 Cal.App.4th at pp. 609-610.) In so doing, the court also acknowledged that the "Commission is the finder of fact in the first instance in evaluating the information in the record." (*Id.* at p. 611, citing *NRDC, supra*, 28 Cal.App.4th at p.1125.) The court also clarified:

"[T]he standard, at this threshold in the listing process, requires only that a substantial possibility of listing could be found by an objective, reasonable person. The Commission is not free to choose between conflicting inferences on subordinate issues and thereafter rely upon those choices in assessing how a reasonable person would view the listing decision. Its decision turns not on rationally based doubt about listing, but on the absence of any substantial possibility that the species could be listed after the requisite review of the status of the species by the Department under [Fish and Game Code] section 2074.6." (*Ibid.*)

Finally, the definitions in CESA of endangered and threatened species are tantamount in any determination as to whether the BBWO Petition contains sufficient information to indicate that the petitioned action may be warranted. The Fish and Game Code defines "endangered species," in pertinent part, to mean:

"[A] native species or subspecies of a bird, mammal, fish amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat,

over exploitation, predation, competition, or disease.” (Fish & G. Code, § 2062; see also *California Forestry Association, supra*, 156 Cal. App. 4th at p. 1540, 1549-1551 (“range” for purposes of CESA means the range of the species in California).)

Likewise in pertinent part, the Fish and Game Code defines “threatened species” to mean:

“[A] native species or subspecies of a bird, mammal, fish amphibian, reptile, or plant that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by [CESA].” (Fish & G. Code, § 2067.)

The Department’s Petition Evaluation Report and Related Recommendation to the Commission

As indicated earlier, the Department has prepared this Evaluation Report consistent with controlling statute and regulation. (Fish & G. Code, § 2073.5; Cal. Code Regs., tit. 14, § 670.1, subd. (d).) Fish and Game Code section 2073.5 directs the Department to “evaluate the petition on its face in relation to other relevant information,” and to submit to the Commission a “written evaluation report” with a recommendation as to whether or not the petition contains sufficient information to indicate the petitioned action may be warranted. The related regulation repeats the same charge, focusing the Department’s obligation more specifically on an evaluation of whether the petition contains “sufficient *scientific* information” to indicate that the petitioned action may be warranted based on certain petition content requirements prescribed by Fish and Game Code section 2072.3. (Cal. Code Regs., tit. 14, § 670.1, subd. (d)(1) (*italics added*).) Consistent with that authority, controlling regulation directs the Department to prepare its initial evaluation of a petition and make its related recommendation to the Commission based on all of the following:

- population trend;
- range;
- distribution;
- abundance;
- life history;
- kind of habitat necessary for survival;
- factors affecting the ability to survive and reproduce;
- degree and immediacy of the threat;
- impact of existing management efforts;
- suggestions for future management;
- availability and sources of information; and
- a detailed distribution map.
(*Id.*, § 670.1, subd. (d)(1)(A)-(L).)

As set forth the below, the Department's initial evaluation of the BBWO Petition on its face, and in relation to other relevant information the Department possesses or has received to date from interested persons, focuses on each of these components.

With respect to the Department's related recommendation to the Commission as to whether the BBWO Petition contains sufficient information to indicate the petitioned action may be warranted, the Department notes its statutory charge is cast in terms similar to that of the Commission. (Compare Fish & G. Code, §§ 2073.5 and 2074.2.) The Department notes at the same time, however, that the Commission, a constitutionally established distinct entity, is vested under California law with exclusive statutory authority to make listing determinations under CESA. (Cal. Const., art. IV, § 20, subd. (b); Fish & G. Code, § 2070.) The Department, in this sense, serves in an advisory capacity in the CESA listing process, providing evaluation and analyses to the Commission, and related recommendations regarding final determinations ultimately vested with the Commission alone. (See, e.g., *Id.*, §§ 2071.5, 2072.7, 2073.5, 2074.6; Cal. Code Regs., tit. 14, § 670.1, subds. (d)(1), (f).) That the Department serves in an advisory capacity to the Commission in the CESA listing process is highlighted in related appellate case law, all of which involve judicial review of final Commission action and a related acknowledgement by the court that the Commission alone is vested with exclusive authority to make listing decisions under CESA. (See *NRDC*, *supra*, 28 Cal.App.4th at p. 1108; *CBD*, *supra*, 166 Cal.App.4th at p. 599; *California Forestry Association*, *supra*, 156 Cal.App.4th at pp. 1540-1541.)

The Department's charge and focus in its advisory capacity to the Commission is scientific. As noted above, the provisions in the Fish and Game Code governing the Department and Commission's obligations at the first step in the CESA listing process are both cast in terms of whether the petition at issue contains sufficient information to indicate that the petitioned action may be warranted. (Fish & G. Code, §§ 2073.5, 2074.2.) The title of the subparagraph in the regulation governing the Department's obligations at the same first step directs the Department to evaluate the petition and make its related recommendation to the Commission based on whether there is "Sufficient Scientific Information." (Cal. Code Regs., tit. 14, § 670.1, subd. (d)(1).) The same is true at the second step in the CESA listing process where the Department is charged by statute and regulation to provide a written status review of the biological status of the species, and a related recommendation to the Commission as to whether the petitioned action is warranted based on the "best available science." (Fish & G. Code, § 2074.6; Cal. Code Regs., tit. 14, § 670.1, subd. (f).) Emphasizing the same point to ensure that end, the Department is also charged by regulation to subject a preliminary draft of a candidate species status review to independent and competent peer review whenever possible. (*Id.*, subd. (f)(2).)

The Department's scientific mandate and focus in its advisory capacity to the Commission during the CESA listing process bears emphasis in light of the Third

District Court of Appeal's decisions in *NRDC* and *CBD*. As noted above, both decisions involve judicial review of Commission candidacy determinations at the first step in the CESA listing process. Moreover, the decisions comprise the entirety of published appellate case law at this point in time governing the candidacy evaluation test under CESA. Both decisions, in turn, cast the Commission's "may be warranted" obligations under Fish and Game Code section 2074.2 in terms of whether a reasonable person would conclude that there is a substantial possibility list could occur. (*NRDC, supra*, 28 Cal.App.4th at p. 1125; *CBD, supra*, 166 Cal.App.4th at pp. 609-610.) Indeed, the court in *CBD* emphasized as noted above that the "reasonable person standard is an objective standard" and it "does not permit the trier of fact [i.e., the Commission as a constitutionally established entity comprised of individual commissioners] to substitute his or her own subjective view for the objective, reasonable person." (*Id.* at p. 610, fn. 13.) In short, under controlling law, the Commission's obligation at this first step in the CESA listing process is to discern what an objective, reasonable person would conclude in light of the information contained in the BBWO Petition. In its advisory capacity to the Commission at the same first step, the Department is charged by law to provide a scientific evaluation and a related recommendation to the Commission reflecting the Department's independent judgment as to whether the BBWO Petition contains sufficient scientific information to indicate that the petitioned action may be warranted. (Fish & G. Code, § 2073.5; Cal. Code Regs., tit. 14, § 670.1, subd. (d)(1).) To that end, the Department's evaluation as set forth below, along with its related recommendation as set forth in this Evaluation Report, are based on and reflect the Department's independent scientific analysis and recommendation as to whether the Commission should accept the BBWO Petition for further consideration, designating the species as a candidate for listing under CESA.

EVALUATION OF THE INFORMATION PROVIDED IN THE PETITION AND OTHER INFORMATION THE DEPARTMENT POSSESSES OR THAT IT RECEIVED DURING THE EVALUATION PERIOD

SUMMARY OF DEPARTMENT'S EVALUATION

BBWO occur in a variety of montane and boreal coniferous forest types throughout their range (Dixon and Saab 2000).

Although BBWO can be found in green forests, the highest densities of the species are found in recently burned forests.

BBWO apparently prefer intensively burned forests (i.e. forests that burned in hot fires resulting in near total tree mortality) over unburned forests and forests that burn at lower intensities (Hutto 1995, Smucker et al. 2005).

BBWOs feed on larvae of wood-boring beetles and bark beetles with other insects, spiders, and vegetable matter forming a small part of the diet.

The average life span of the BBWO is unknown; closely related species have a short life span of six to eight years.

The Department found the species is generally silent throughout much of the year, and therefore difficult to locate. The timing of surveys and methods used for monitoring the species should take this into consideration.

The Department has determined that range trend in California is stable based on comparison of available data.

The Department has concluded that, based on a comparison of the historical and current population status of the BBWO derived in large part from qualitative descriptions and few data, the population trend is unknown.

The Department believes further study of the connectivity between California populations and the greater species' range and of the genetic structure of California's BBWO population is warranted.

The importance of unburned (green) forest habitat may be understated in the Petition.

The Petitioners' conclusion that BBWO rely on old growth conifer forests when burned forests are unavailable lacks sufficient supporting scientific information.

A primary concern in this evaluation is the lack of information about estimates of BBWO populations in unburned forests. The resulting uncertainty hampers the ability of scientists and managers to accurately estimate statewide BBWO

population levels. Consequently, our understanding of the extinction/extirpation threat to the species is deficient.

The Department generally agrees with the Petition regarding the negative impacts to BBWO from post-fire salvage logging, active fire suppression, and pre-fire forest thinning.

The Department believes the Petition's discussion of the negative impact on BBWO from the loss of old forests due to past logging is not supported by available information.

LIFE HISTORY (Discussed under "*Life History of the Black-backed Woodpecker*" beginning on p.10 of the Petition, including sections on Description, Taxonomy, Reproduction, Diet and Feeding, and Migration)

The Petition, in general, presents accurate information on the life history of the BBWO. The Department finds parts of the Petition's *Life History* discussion (e.g. Migration p.16) more appropriately discussed under other headings (e.g. Range and Distribution). Minor inaccuracies found in the Petition are addressed below and, as needed, detail is added.

Systematics: The Petition includes some information on taxonomy and related species (p.12). The Department expands upon the subject, as follows: A member of the Woodpecker Family (Picidae) and the Genus *Picoides* (of which there are now nine species recognized globally; six occurring in California, AOU 1998), the BBWO is most closely related to the Three-toed Woodpecker (*Picoides tridactylus*; TTWO), a species not known to occur in California. BBWO is monotypic. Although Bangs (1900) postulated that morphological distinctiveness noted in specimens obtained from Oregon merited subspecies designation, no subspecies has been recognized for the species (Grinnell et al 1930, AOU 1957). Pierson et al. (2010) found three population clusters of BBWO: 1) a continuous population extending from the Rocky Mountains to Quebec; 2) a western population (samples from Oregon); and, 3) South Dakota. These clusters suggest barriers to gene flow. California BBWOs were not included in the study and therefore the genetic distinctiveness of the California population is unknown. The Petition correctly notes that California was not sampled in the referenced study (p.17) then erroneously claims that the BBWO population in California is known to be genetically distinct based on Pierson et al 2010 (Appendix E, Part 1). The Department believes further study of the genetic structure of California's BBWO population is warranted.

Description: BBWO is a medium-sized woodpecker, black above, white below with black and white barring on its sides. Males exhibit yellow crowns; female crowns are black. Juvenile crown patch, if present, is reduced. Generally, woodpeckers possess feet which are "zygodactyl" (two toes pointing forward, two

toes pointing rearward), an adaptation resulting in efficient climbing and clinging ability on tree trunks and limbs (Leahy 2004). BBWO (and TTWO), however, possess only three toes. This arrangement, along with other morphological modifications, allows the species to deliver hard blows with the bill when “drilling” for food at the expense of graceful vertical climbing ability (Spring 1965). The Petition indicates erroneously or unclearly that the elimination of one toe is an adaptation which allows the species to “dig out” wood-boring beetle larvae (p.10).

Sounds: The Petition presents accurate information on the vocal repertoire of the BBWO. Additionally, the Department finds the species is generally silent throughout much of the year, and therefore difficult to locate, except during the early breeding season when both sexes drum, during excavation of the nest and when chicks are begging for food at the nest (Dixon and Saab 2000).

Demography: The average life span of the BBWO is unknown. The U.S. Geological Services Bird Banding Lab (USGS BBL 2010) reported a banded BBWO recaptured at four years 11 months. The closely related TTWO (and White-headed Woodpecker (*Picoides albolarvatus*)) life span is six to eight years (Dixon and Saab 2000).

Reproduction: The Petition section entitled Reproduction (p.13) includes some material (e.g., nesting habitat choices) which the Department discusses under *Habitat Necessary for Survival*. The Petition accurately describes the breeding biology of the BBWO; the Department elaborates on several aspects here. In Oregon, the dates when BBWO may excavate nests span April 27 through mid-June (Dixon and Saab 2000). The incubation period is reported at probably 12-14 days; the fledging period is probably 21.5-25 days (Ehrlich et al. 1988, Dixon and Saab 2000).

Food Habits: In general, the Petition includes accurate information on the diet and feeding habits of the BBWO (pp.15-16). The species feeds by drilling into the trunks of trees to obtain insect larvae and by flaking bark to expose insect prey. Primarily, BBWOs feed on larvae of wood-boring beetles (Families Cerambycidae and Buprestidae) with other insects, spiders, and vegetable matter forming a small part of the diet (Dixon and Saab 2000). Beal (1911) in Bent (1939) reported 75% of the stomach contents [of both BBWO and TTWO] consisted of wood-borers; bark beetles (Order Coleoptera) are also eaten (Goggins et al. 1989). BBWO have also been observed to feed on mountain pine beetles (*Dendroctonus ponderosae*) in unburned forests in South Dakota (Bonnot et al. 2008). Powell (in Marshall et al. 2003) noted that wood-borers and bark beetles are “two groups of insects [which] differ markedly in size, colonization abilities, population dynamics, etc., so they should not be considered equivalent food types, and by extension burned forests and bark-beetle outbreaks should not be considered equivalent habitats.” The Petition did not include information on the life cycles of important prey items (e.g., wood-boring beetles, bark beetles) or describe beetle ecology, particularly in relation to fire

and fire intensity in Sierra Nevada coniferous forests. Foraging habitat is described in the Petition on pp.15-16; the Department discusses these sections under the *Habitats Necessary for Survival* section below.

The Department did not find evidence of the Petition's claim that BBWO is "highly specialized in its foraging ecology and diet" (p.16). Rather, there is a broad overlap in geographic range, foraging behavior, and food habits between BBWO and Hairy Woodpeckers (Bull 1986) and TTWO (Murphy and Lehnhausen 1998).

RANGE AND DISTRIBUTION (Discussed under "*Range and Distribution*" in the Petition beginning on p.17, including sections on Range-wide Distribution and California Distribution; also see p.16 Migration)

The Department finds the Petition's assessment of the global range of the BBWO (p. 17) to be accurate. The species is a North American endemic, ranging from southwestern Alaska east through Canada (southern Yukon, west and central Northwest Territories, northern Saskatchewan, northern Alberta, northern and central Manitoba, Ontario, central Quebec, central Labrador, and Newfoundland), northern New York and Maine; south to central and eastern British Columbia through western Montana, northwestern Wyoming, Idaho, eastern Washington, central and eastern Oregon and north-central and eastern California through the Sierra Nevada to Tulare County; and northern parts of Minnesota, Wisconsin and Michigan. A disjunct population is found in the Black Hills of southwestern South Dakota (Dixon and Saab 2000). The BBWO reaches its southernmost range in California's southern Sierra Nevada. The species is resident within its range but, as described accurately in the Petition, BBWOs are known to move southward from their range at irregular times, varying from scattered individuals to large irruptions (see Movement, below.)

The Petition describes the California range of the BBWO under the headings of Range-wide Distribution and California Distribution (pp.17-19). The Department generally agrees with the assessment except where noted below, and further augments the discussion, as follows:

Historic Range and Distribution in California: For the purposes of this assessment, the Department defines the historic period as being up to, and including, the year 1949. This approach generally conforms to the methods outlined in Shuford and Gardali (2008) which used the publication of Grinnell and Miller (1944) as the separation date between the historic and recent periods. The Department found a few museum records from the late 1940s that, for convenience, were added to the historic data set. Grinnell and Miller (1944) described the range of the BBWO in California as "of small extent and interrupted nature; chiefly Cascade Mountains and high northern and central Sierra Nevada, south to about latitude 37° 30'; peripherally west through the Siskiyou Mountains, east to Warner Mountains, Modoc County, and south to Tulare County." The species was recorded at altitudes ranging from 4,000 ft to 10,168 ft. Specific

locations with known occurrences included: Poker Flat, Siskiyou Mountains and Mount Shasta, Siskiyou County; Warner Mountains and Eagleville, Modoc County; Lassen Peak section, Battle Creek Meadows and Mineral, Tehama County; Manzanita Lake, Merrillville, and Eagle Lake, Lassen County; Gold Lake, Sierra County; Light's Canyon and unnamed sites, Plumas County; Butte County; Truckee River, Soda Springs, and Blue Canyon, Placer County; Silver Creek, Pyramid Peak, Upper and Lower Velma Lakes, Glen Alpine and many other locations around Lake Tahoe, Placer and El Dorado counties; Big Trees, Calaveras County; Yosemite region (many locations), Mariposa County; Tuolumne Meadows, Tuolumne County; and Reflection Lake, Tulare County" (Barlow and Price 1901, Cooper 1870, Grinnell 1915, Dawson 1923, Grinnell et al. 1930, Grinnell and Miller 1944; Museum of Vertebrate Zoology (MVZ) online collections; California Academy of Sciences (CAS) online collections; see Figure 1).

Current Range and Distribution in California: The current range of the BBWO in California is similar to the historic range; however, recent locality records extend the range southward to the southern Sierra Nevada (Figure 2). The known current range in California is based on literature review, recent field studies including Institute for Bird Populations (IBP), Point Reyes Bird Observatory (PRBO), U.S.D.A. Forest Service (USFS), California Partners in Flight (CPIF) monitoring sites and "eBird" (a citizen science online initiative hosted by the Cornell Laboratory of Ornithology and National Audubon Society) and other sources.

California Range Trend: The current range of the BBWO in California is slightly greater than the documented historic range. The Department believes it is likely that the new records do not represent range expansion but rather are the result of better observer coverage and the species' known ability to respond to favorable habitat conditions (wildfire and/or beetle infestations). Therefore, the Department has determined that range trend is stable based on comparison of available data. The Petition does not make a statement about the range trend of the BBWO in California.

Movement: BBWO are nonmigratory throughout their range including California. They may shift to lower elevations in winter (Small 1994, Dixon and Saab 2000); however, this phenomenon is not well-documented in California. The Wildlife Habitat Relationships range map depicts winter range at lower elevations on the western slope of the Sierra Nevada (<http://www.dfg.ca.gov/biogeodata/cwhr/>); however, the Department did not find evidence of seasonal movement in California. BBWO are known to periodically "irrupt"; that is, move into areas beyond their usual range, generally southward. Irruptions occur at irregular intervals and locations; these irruptions appear to correspond to insect outbreaks following fires, windthrows, and other forest mortality factors (Yunick 1985). Irruptions have been documented in northeastern and midwestern United States in 1860-61 (Massachusetts), 1923, 1956-57, mid-1960s, and the early 1970s

(Van Tyne 1926, West and Speirs 1959). The Petition does not contain, and the Department does not have nor did it receive, any information about irruptions of BBWO in California.

Range Isolation: The Department disagrees with the Petition statement that the California population of BBWOs may be disjunct from “the continuous boreal forest population” (p.17). They based this assertion on range maps from two popular bird field guides. The Department finds these references to be insufficiently detailed and of a scale inadequate to indicate that range connectivity may or may not exist between California and elsewhere. According to Marshall et al. (2003), the species is resident in Oregon on the east and west sides of the Cascades, Blue Mountains, the Clackamas River drainage, and the Siskiyou Mountains. In Washington, BBWO ranges on the east slope of the Cascade Mountains and the coniferous forests to the east (Rodrick and Milner 1991). Collectively these accounts show that the California population is contiguous with populations in those states; however, the Department agrees with the Petition (p.17) that further study of the BBWO in California is warranted to determine the relationship to other populations of the species.

HABITAT NECESSARY FOR SURVIVAL (Primarily discussed under the “*Habitat Requirements*” section of the Petition, beginning on p.20; also in the “*Life History*” section beginning on p.10, and the “*Nature, Degree, and Immediacy of Threats*” section beginning p.46)

The Petition’s discussion accurately reflects the published literature, although, as explained further below, the importance of unburned (green) forest habitat may be understated in the Petition and the Petitioners’ conclusion that BBWO rely on old growth conifer forests when burned forests are unavailable lacks sufficient supporting scientific information.

BBWO occur in a variety of montane and boreal coniferous forest types throughout their range (Dixon and Saab 2000). Although BBWO can be found in green forests, the highest densities of the species are found in recently burned forests (Hutto 1995, Hanson and North 2008). BBWO reach their greatest densities in burned forests within the first five to eight years following the fire. By the end of this brief period, the combination of decreasing snag densities, declining numbers of beetle larvae prey, and increasing numbers of nest predators recolonizing the burn area results in habitat that is no longer optimal for the species (Hanson and North 2008). Additionally, BBWO apparently prefer intensively burned forests (i.e. forests that burned in hot fires resulting in near total tree mortality) over unburned forests and forests that burn at lower intensities (Hutto 1995, Smucker et al. 2005).

Old Growth Forests: The Petition concludes that BBWO may rely on old growth conifer forests when burned forests are unavailable. The Department believes this conclusion is not well supported. The Petition cites Settington et al. (2000)

who reported that within unburned forests of Newfoundland, BBWO had higher nest densities and greater reproductive success in areas of mature forests; however, forest stands characterized by the authors as “mature” were only approximately 80 years old. Additionally, the Petition states that unburned old-growth coniferous forests are important to the species when recently burned forests are unavailable citing Hoyt and Hannon (2002); however, in their Alberta study old growth is described as >110 years old which is relatively young relative to concepts of old growth in the Sierra Nevada. For example, Beardsley et al. (1999) define the minimum age of forest stands classified as old growth in the Sierra Nevada as 125-256 years old depending on stand type.

There is strong evidence that BBWO favor recently burned forests which had high levels of canopy cover and high densities of larger trees prior to burning (Russell et al. 2007, Hanson and North 2008). For example, Russell et al., in northern Idaho, found that one of the best predictors of high post-fire BBWO nesting density was high pre-fire canopy cover, and that nest densities increased with increasing snag densities and diameters. Evidence exists to support the conclusion that BBWO select forest stands with larger trees and higher tree densities, in both burned and unburned forests; however, the claim that BBWO rely on old growth forest is unsupported by the existing body of literature.

Nesting Habitat: BBWO excavate cavity nests in live and dead conifer and broadleaf trees (aspen), favoring relatively hard recently dead snags (Raphael and White 1984). Snags (standing dead trees) used for nesting have been found to be slightly larger than the average available snags (Ibid, Saab and Dudley 1998). Raphael and White (1984) found the average diameter of trees used for nesting by BBWO in the Sierra Nevada was 44.5 cm (17.5 in) while the average diameter of available trees was 32 cm (12.6 in). However; among the five species of woodpeckers studied by Saab et al. (2002), BBWO used the smallest diameter snags for nesting.

Several studies show that BBWO nest densities are highest in areas with the highest snag densities (Ibid, Russell et al. 2007, Vierling et al. 2008). Russell et al. (2007) found that the best model for predicting BBWO nesting included high pre-fire canopy closure, high average tree diameter, and high large snag densities. When post-fire snag densities are reduced by salvage logging BBWO nesting densities are greatly reduced (Saab and Dudley 1998, Dixon and Saab 2000, Hutto and Gallo 2006, Cahall and Hayes 2009). Nesting densities were found to be nearly four times greater in unlogged burned areas than in salvage logged burned areas, even when substantial numbers of snags (32-52% of small snags and approximately 40% of large snags) were retained in the salvaged areas (Saab and Dudley 1998).

BBWO appear to require large patches of suitable habitat for nesting. In burned forests in Idaho, BBWO nests were absent from stands (areas of uniform tree species, size, and distribution) of less than 12 ha (29.7 ac), and nest stands

averaged 37.16 ha (91.8 ac) (Saab et al. 2002). Russell et al. (2007), also working in Idaho found the average BBWO nest stand to be 112.47 ha (277.92 ac).

Foraging Habitat: BBWO forage chiefly on the trunks of larger, less decayed snags and logs within dense stands of intensively burned conifer trees (Murphy and Lehnhausen 1998, Kreisel and Stein 1999, Russell et al. 2007, Hanson and North 2008). BBWO appear to require higher densities of snags for foraging than they do for nesting (Hutto and Gallo 2006). Hanson (2007) found BBWO foraging on large (>50 cm [19.7 in]) snags more than expected based on availability, which is likely explained by the fact that their primary food, wood-boring insect larvae, are found in greater numbers in larger diameter snags (Nappi et al. 2003). Bull (1986) found BBWO in Oregon foraged for insects on live and dead trees in equal proportion. When using snags, BBWO preferred recently dead trees averaging 34 cm (13.4 in) diameter at breast height (dbh), and 19 m (62.3 ft) tall (Ibid.).

In burned forests in the Sierra Nevada, BBWO were found to forage almost exclusively in stands which had burned at high intensity and were not salvage logged in a recent study (Hanson and North 2008). Foraging was found to be nearly absent from areas which had burned at moderate or low intensity and from high intensity burn areas which had been salvage logged, even with the retention of at least 7.5 large (>50 cm [19.7 in]) snags per hectare (2.47 ac) as prescribed by the Sierra Nevada Forest Plan Amendment (USDA 2004). Studies in the Rocky Mountains have also reported BBWO strongly favor recently burned forests which burned at high intensity (Hutto 1995, Smucker et al. 2005).

Unburned Habitat: The Petition provides little information on the use of unburned forests by BBWO, although some discussion can be found in Appendix F of the Petition regarding population modeling. Furthermore the Department does not have nor did it receive any additional information on the topic. This lack of information is indicative of the fact that there have been few published studies of the species' ecology outside of burned environments. As explained further below, the Department believes the Petition may substantially underestimate the importance of unburned forest as habitat for the species, and to statewide population levels.

As the Petition indicates, BBWO densities appear to be significantly lower in unburned forests than in recently burned forests (Hutto 1995, Hanson and North 2008); however, there is little discussion in the Petition of the fact that BBWO are known to occur and nest in green forest stands and stands infested with bark beetles (Bull et al. 1986, Goggans et al. 1989, Bonnot et al. 2008). Forty percent of the BBWO nests found in an Oregon study were in live trees and BBWO were observed foraging nearly equally on live and dead trees, with a preference for lodgepole pine (*Pinus contorta*) (Bull et al. 1986). Goggans et al. (1989) found in a study of pine beetle infested forests of Oregon that 22 of 35 BBWO nests were

in live trees, and all nests were in lodgepole pine. Sixty six percent of the nests were in stands with mountain pine beetle outbreaks and 34% in stands not significantly impacted by beetles. The mean nest tree was 27.9 cm (11 in) dbh and canopy cover averaged 24% in unharvested stands and 11% in harvested stands.

The Petitioners, using USFS Management Indicator Species monitoring point count data (<http://data.prbo.org/partners/usfs/snmis/>) to model an estimate of the BBWO population in green tree habitat, determined there may be 200-300 pairs in unburned forests in California. The Department believes there is substantial uncertainty associated with this estimate. The population estimate is based upon nine BBWO detections, a small number. When expanding a small sample size to a statewide model there is a high likelihood of introducing exponentially large errors. Additionally, the Petition makes an assumption unsupported by data in equating the probability of detecting individuals in burned and green forest to nesting densities in burned and green forests.

It is possible to construct a contrasting estimate of a statewide BBWO population in unburned forests from recent unpublished surveys conducted in the Sierra Nevada. Surveys in the Sierra National Forest have detected eight BBWO nests in seven years of surveying eighteen 1,000 meter transects (Purcell 2010). Assuming that BBWO can reliably be heard within 50 m of a surveyor, eighteen 1,000 meter transects would cover an area of 180 ha (444.8 ac), and over seven years of surveying 1,260 ha would have been covered. Eight nest detections divided into 1,260 ha yields one nest per 157.5 ha (389.2 ac) surveyed. Considering there are 409,542 ha (1,012,000 ac) of lodgepole pine forest in California (Christensen et al. 2008: Appendix 2, Table 5), there could be as many as 2,600 BBWO nests in green lodgepole pine in California alone. If the area of other potentially occupied conifer forest types, such as mixed conifer, Douglas-fir (*Pseudotsuga menziesii*), western white pine (*Pinus monticola*), fir (*Abies sp.*)/spruce (*Picea sp.*)/mountain hemlock (*Tsuga mertensiana*), red fir (*Abies magnifica*), and ponderosa pine (*Pinus ponderosa*) are factored in, the number of nests in green forests could be in the tens of thousands. There are, however, several unsupported assumptions associated with this estimate, such as adequate habitat patch size of all suitable tree cover types, and 100% occupancy of suitable types.

In underestimating the importance of unburned forest as habitat for the species, the Petitioners also fail to consider the potential population of BBWO in unburned insect-infested forests in California. There were an estimated 48,967 ha (121,000 ac) of conifer forest with >25% of stand basal area damaged by bark beetles in the period of 2001-2005 (Christensen et al. 2008; Appendix 2, Table 40). Bonnot et al. (2008) determined a nest density of one nest per 307.7 ha (760.3 ac) in mountain pine beetle infested trees in South Dakota. Therefore there was the potential for as many as 159 BBWO nests in bark beetle infested conifer stands in CA during that time period. The number of BBWOs in bark

beetle infested forests would be expected to vary widely from year to year as beetle infestations tend to occur over large areas of California forests in some years and be very limited in others. Although this estimate relies on several assumptions it demonstrates the uncertainty of the conclusions provided in the Petition.

A primary concern in this evaluation is the lack of information in the Petition, and possessed or received by the Department, about estimates of BBWO populations in unburned forests. The resulting uncertainty hampers the ability of scientists and managers to accurately estimate statewide BBWO population levels. Consequently, our understanding of the extinction/extirpation threat to the species is not fully informed. BBWO density in unburned forests in California must be considered a primary information gap and research priority for this species.

ABUNDANCE AND POPULATION TREND (*“Abundance and Population Trend”* in the Petition, beginning on p.29)

The BBWO and the TTWO are the most elusive and poorly known members of the Woodpecker Family in North America. Both of these closely related species may become temporarily abundant in response to an increase in food resources but usually they are uncommon (Bock and Bock 1974). The Petition accurately states that BBWO population numbers appear to be subject to significant fluctuations based on environmental conditions, especially the presence of super-abundant food resources, recruitment, and effects of management activities (p. 29). This aspect of BBWO ecology increases the difficulty in assessing population size, and especially population trends, in a shifting landscape.

Global Abundance: Rich et al. (2004) estimated the global population of BBWO at 1,300,000 individuals. This estimate is derived from extrapolation of Breeding Bird Survey (BBS) results from the 1990s throughout the species’ range and was assigned a data-quality color code of “yellow” (medium quality).

Historical Abundance in California: For the purposes of this assessment, the Department defines the historic period as being up to, and including, the year 1949. The Petition lacks, and the Department does not have nor did it receive quantitative historical population data for BBWO in California; however, the population status of the BBWO may be surmised from qualitative statements with caution. BBWOs were variously described as “sparse”, “scarce”, “rare”, “very local”, or “locally common” by early ornithologists from regional and statewide perspectives (Belding 1890, Dawson 1923, Grinnell and Storer 1924, Grinnell and Miller 1944). Grinnell (1915) characterized the species as “fairly common locally” in the Boreal Zone [2,438 m-3505m; 8,000 ft-11,500 ft] within the range of the species. Dawson (1923) considered it to be a “rare and very local resident”

while Grinnell and Miller (1944) described it as “scarce generally; fairly common in but a few places”. Several regional treatments further characterize historical abundance of the BBWO as follows:

Lassen Region

Grinnell et al. (1930) noted that the BBWO was found “sparsely in the main mountainous portion of the section from Battle Creek Meadows east to near Merrillville at altitudes...from 4,800 ft to 8,200 ft” elevation.

Northern Sierra Nevada

Keeler (1899) characterized BBWO as “one of the rarer species breeding in the northern Sierra Nevada mountains.”

Lake Tahoe Region

Cooper (1870) found the species to be “quite numerous” at Lake Tahoe and the Sierra Nevada above 6,000 ft. elevation in September; Henshaw (1877) also described BBWO as “rather common” around Lake Tahoe...in September, October and November”. Orr and Moffitt (1971) noted that “the only time this species was observed at lake level was on August 30, 1940...at Rubicon Point.”

Yosemite Region

Grinnell and Storer (1924) described BBWO as a “sparse resident of Canadian and Hudsonian zones [2,896m-3,505m; 9,500 ft-11,500 ft elevation] on [the] west slope of the Sierra Nevada” in the region around Yosemite.

Nevada and Oregon near the California border

Henshaw (1880) in Belding (1890) found the BBWO to be “a rather common and constant resident of the pine woods from Carson northward into Oregon.” The survey transect probably did not cross California.

The Department does not have nor did it receive regional summaries for the Siskiyou Mountains or the Warner Mountains. Only one record of BBWO was available for the western Siskiyou Mountains (Poker Flat, two individuals collected in early July 1935; MVZ). Grinnell and Miller (1944) considered the species peripheral there.

Current Abundance in California: The Petition fails to state, and the Department does not have nor did it receive, any quantitative data on the population size of BBWOs in California. The Petition, acknowledging the dearth of information on the population size and trend in California, relies upon habitat modeling to develop an estimate of abundance for the State (p. 36). Their modeling exercise yielded a current population estimate of between 161 to 300 pairs of BBWO in burned forests and between 200-300 pairs in unburned forests in California,

including both suitable and marginal habitats (p. 40). The Department believes there is substantial uncertainty associated with these estimates. The population estimate is based upon a small sample size. When expanding a small sample size to a statewide model there is a high likelihood of introducing exponentially large errors. Further, several assumptions used to build the habitat models are not substantiated by scientific literature. The Department discusses the Petition's habitat model in Habitat Necessary for Survival (above) and Degree and Immediacy of Threat (below).

Rosenberg (2004) estimated the California population of BBWO at 6,300 individuals based on Partners in Flight and BBS methodology. The Department agrees with the Petition's assessment (Appendix E) that the population estimate is not based on a robust data set and is of limited value. The Department did not rely on it for an assessment of abundance.

The Department reviewed statewide and regional treatments for qualitative information on the current population status of the species in California. Small (1994) referred to BBWO as a "rare to uncommon local resident". Siegel et al. (2010) found indication that BBWO occupancy rates were higher in northern portions of their California range and at relatively high elevations.

Northwestern California

Only one record [unverified but by a reliable observer] was reported of a single bird near Crawford Creek, Siskiyou County in 1993 (Harris 2005).

Sierra Nevada-General

According to Beedy and Granholm (1985), BBWO were "...rare in the Sierra, [but] ... fairly common in recently burned forests at higher elevations." Siegel and DeSante (1999) classified them as "rare" in the Sierra but speculated that a positive BBS trend may have been real due to outbreaks of bark beetles brought on by drought and fire.

Lake Tahoe Region

Orr and Moffitt (1971) described BBWO as resident in small numbers, particularly at higher elevations: "Arctic three-toed woodpeckers [BBWO] can hardly be classed as common in the Tahoe Region but they may regularly be observed above 8,000 ft during the breeding season. In the fall of the year, there is some indication of a downward population movement toward lake level."

Yosemite Region

Gaines (1992) considered them to be rare residents on the west slope of Yosemite from 6,500 ft to 9,000 ft. and extremely rare lower and higher on the west slope; and an extremely rare visitor east of crest. He noted, "...nowhere have I found these reclusive birds dependably. I suspect they wander from year to year, settling down to nest in areas infested with the larval bark insects that are their primary fare."

Southern Sierra Nevada

According to Sumner and Dixon (1953), BBWO was “a rather rare, high mountain woodpecker, restricted to the higher levels [of Sequoia and Kings Canyon National Parks] but apparently resident there. ...In the Kings, the species has been recorded as a resident in the Hudsonian Zone.”

Nevada

The species is considered rare and reported only from limited areas in extreme western parts of the state (Alcorn 1988). The first documented BBWO nests in Nevada were found in 2002 in the Lake Tahoe Basin (Richardson 2003).

Population Trend: The Petition lacks, and the Department does not have nor did it receive, information that adequately shows BBWO population trend in California. Statewide monitoring strategies (e.g. BBS, Monitoring Avian Productivity and Survivorship (MAPS) program, National Audubon Society’s Christmas Bird Count (CBC)) have all detected BBWO in California but are inadequate to show population trend. BBS data shows no significant long-term population trend for BBWO in California (Sauer et al. 2008), in large part because BBWO are too rarely detected to be reliably monitored by this program. In California, BBWO were recorded on only nine routes of the 80 possible routes found within the species’ range from 1968-2009; a total of 30 individuals were detected for all years. The CBC program rarely detects the BBWO within California count circles. The species was reported from only six circles in California from 1963-2009, for a total of 41 individuals. Usually only one individual BBWO was detected per year. A high count of nine individuals on three count circles (Yosemite, South Lake Tahoe, and Lake Almanor) in 1991-92 was unusual. These data are too few to determine trend. A few BBWO were detected at each of four MAPS stations (Freeman Meadow, Tamarak Meadow, Sierra Nevada, Sagehen Creek) during recent years.

The Department agrees with the Petition that a comparison of historical accounts with recent observations may yield, in some cases, important information about the status of a species over time. However, in this case, the Petition erroneously attempts to characterize a statewide population decline, evident to the Petitioners by 1923, based on essentially incomparable qualitative data. The Petition (p. 34) claims that the BBWO was “relatively common” in California during the 19th century based on *one* account (Cooper 1870), which was made in September (therefore post-breeding season) at Lake Tahoe and the “summits of the Sierra Nevada”. They compare this account to another *single* account (Dawson 1923) in which the author stated he never found the species despite searching diligently for it. There are many problems with such an approach. There is no indication that the two explorers surveyed the same areas. Dawson did not apparently survey the Lake Tahoe region and Cooper did not apparently survey the Warner

Mountains, Shasta and south central Sierra Nevada. The Petition lacks, and the Department does not have nor did it receive information on the condition of the habitat or the food resources available in either case, nor the level of effort expended during either survey. Thus, the Department has concluded that, based on a comparison of the historical and current population status of the BBWO derived in large part from qualitative descriptions and few data, the population trend is unknown. As a result, the Petition's characterization of a population decline is purely speculative and unsupported by any scientific information.

FACTORS AFFECTING THE ABILITY OF THE POPULATION TO SURVIVE AND REPRODUCE (Discussed in the Petition under "*Factors Affecting Ability of the Population to Survive and Reproduce*" including sections on Predation, Competition and Disease, Ephemeral Nature of Habitat, beginning on p. 42)

The Department generally agrees with the Petition's assessment that predation, disease, competition and the ephemeral nature of BBWO preferred habitat (recently burned coniferous forest) are factors affecting the ability of the population to survive and reproduce. However, the Department did not find that predation, competition or disease is exerting population limiting pressures on BBWO in California, based on the discussion in the Petition (p. 42) and from other sources. According to Dixon and Saab (2000), little to no information is available on predation pressure on adults and effects of disease and parasites on the species. Several issues noted in the Petition under the section "*Nature, Degree, and Immediacy of Threats*" (p. 46) are considered by the Department to be additional factors which do affect the population of BBWO in California (see the following discussion under Degree and Immediacy of Threats, below).

DEGREE AND IMMEDIACY OF THREAT (Discussed in the Petition under "*Nature, Degree, and Immediacy of Threats*" including sections on Post-fire Salvage Logging, Fire Suppression, Thinning: Pre-suppression, Past Loss of Old Forest Due to Logging, and Climate Change beginning on p.46)

The Petition states that habitats have been reduced and degraded on private and public lands throughout the range of the species through post-fire salvage logging, active fire suppression, pre-fire timber management to reduce fire threat, and the past loss of old forests due to logging. The Petition also states that the effects of climate change will further reduce the amount of high quality post fire habitat available to BBWO in the future.

The Department generally agrees with the Petition regarding the negative impacts to BBWO from post-fire salvage logging, active fire suppression, and pre-fire forest thinning. As explained below, the Department believes the Petition's discussion of the negative impact on BBWO from the loss of old forests due to past logging is not supported by available information.

Throughout the Petitioners' discussion of threats, trends in what is understood to be BBWO habitat are essentially examined as a proxy for trends in actual BBWO populations. Given the paucity of data on population sizes and trends this is understandable and is a common approach for evaluating wildlife populations; however, it is important to state that the relationship between trends in habitat and woodpecker population trend is unknown. Additionally, the role of unburned forests in supporting and sustaining BBWO populations over time is currently poorly understood. Better understanding of BBWO use of unburned forest habitat will have greatly influence our understanding of population stability and trend.

Post-fire Salvage: The Petitioners, citing Dixon and Saab (2000), state that BBWO are vulnerable to local and regional extinction as a result of post-fire salvage logging (p.46). The Department finds there is considerable uncertainty associated with this statement when considering the potential role of unburned forests and insect-infested forests in sustaining the species, as well as documented instances of BBWO nesting in salvaged stands, even at reduced levels relative to unsalvaged stands (Saab and Dudley 1998, Cahall and Hayes 2009, Saab et al. 2009).

In every published study either provided with the Petition, received by the Department, or already in the Department's possession that compares BBWO foraging and nesting use of burned and salvage-logged forests to the use of burned and un-logged forests, BBWOs and BBWO nests have been significantly less abundant in the salvage logged stands – even when snags were retained to improve wildlife habitat (Saab and Dudley 1998, Hutto and Gallo 2006, Saab et al. 2007, Hanson and North 2008, Cahall and Hayes 2009, Saab et al. 2009). The Petitioners cite Murphy and Lenhausen (1998), who hypothesized that salvage logging of burned forests may force BBWO into unburned forests where their populations decline over time. Hutto (1995) similarly hypothesized that burned forests act as population sources and green forest as population “sinks” or areas where populations decline over time and are only maintained by immigrating BBWO from burned areas. In the absence of population trend data from unburned forests these hypotheses are speculative. In light of the fact that BBWO range in California does not appear to have contracted, it seems likely that green forests sustain BBWO populations at relatively low, but stable levels, and populations occasionally rapidly expand when fires or insect outbreaks create opportunities.

Fire Suppression: The Petitioners indicate, and the Department agrees, that high quality BBWO habitat (i.e. conifer forests burned at high intensity) is being created at greatly reduced levels compared to historic levels due to modern fire suppression actions (p. 49). Stephens et al. (2007) estimated that an average of 23,000 ha (56,834 ac) of forest land burned annually in California during the period of 1950-1999 compared to an estimated 457,658 – 1,227,445 ha

(1,130,198 – 3,033,083 ac) before the arrival of Europeans. Similarly, Hanson (2007) estimated that 20-50% of middle and high elevation Sierra Nevada forests burned at high intensity during the 19th century, while a recent estimate is that an average of only 6,070 ha (15,000 ac) per year burn at high intensity in the Sierra Nevada (USDA 2004).

The Petition also indicates that snag levels in California forests are very low due to a combination of fire suppression and post-fire salvage logging (p. 53), citing Christensen et al.'s (2008) estimate of less than two snags per acre greater than or equal to 20 inches (50.8 cm) dbh. The California Department of Forestry and Fire Protection (CDF) estimates higher snag levels of 3.8 snags per acre 21" (53.3 cm) dbh or larger and 2.0 snags per acre 29" (73.7 cm) dbh or larger (CDF 2010, table 1.2.12, p. 74). While these levels appear low, the effect on BBWO populations is unknown.

Pre-fire Treatments: The Petition states that pre-fire suppression forest management (e.g. stand thinning and fuel break creation) prevents the creation of high quality BBWO habitat by excluding fire from ecosystems and reducing pre-fire forest stand tree density and canopy cover (p. 53). This is a logical conclusion based on Hutto's (2008) finding of a significant correlation between pre-fire thinning intensity and post-fire BBWO occupancy levels.

Past Loss of Old Forests From Logging: The Petition states that historic logging has decreased the availability of dense, old, forest habitat, decreased the number of large snags within forests, and reduced forest canopy cover over sizable portions of California, thereby removing and degrading BBWO habitat and habitat elements (p. 54). The reduction in California old forests is well documented (Franklin and Fites-Kaufmann 1996, Beardsley et al. 1999, Zielinski et al. 2005). What is less well documented is BBWO dependence on old forests or large trees. For example, Saab and Dudley (1998) reported that of the nine species of cavity nesting birds they studied, BBWO selected the smallest average diameter nest trees; the mean diameter of nest trees in Goggans et al.'s (1989) study was 27.9 cm (11.0 in); and the average snag diameter used for foraging in Bull's (1986) study was 34 cm (13.4 in). As available data do not indicate a strong link between BBWO and large trees or old forests, the Department does not believe the past loss of old forests represents a significant threat to the species.

Climate Change: The Department generally agrees with the Petitioner's view that changes in western North American climate can be expected to result in less annual fire extent and decreased fire intensity within mid and upper elevation conifer forests, thereby further limiting the creation of high quality BBWO habitat (p.57). McKenzie et al. (2004) have noted a trend towards increasing summer precipitation which is expected to reduce the frequency and extent of high-intensity wildfire (Giardin et al. 2009, Parisien and Moritz 2009).

IMPACT OF EXISTING MANAGEMENT EFFORTS (Discussed in the Petition under “*Impact of Existing Management*” including sections on Sierra Nevada Forest Plan Amendment: National Forest Lands, California Forest Practices Rules: Private Lands, and Post-Fire Salvage (Public And Private Lands) Logging Over The Past Seven Years, beginning on p.59)

Current Land Management Practices: The Department finds the Petitioner’s assessment of current land management practices on National Forest lands (p.59) and private lands (p. 62) to be reasonably accurate. One significant omission from the discussion is the management of National Park lands. The National Park System in the Sierra Nevada manages 468,626 ha (1,158,000 ac) of forest land (CDF 2003). Forest lands within these National Parks are not managed for timber production or salvage logged following fires other than in extremely limited wildland/urban interface areas and spot locations for public safety reasons. The Sierra Nevada parks have active wildland fire management programs which include managed natural fires and prescribed fires (Yosemite National Park 2004).

Sensitive Species Designations: State, federal and non-governmental organizations assess and rank the conservation needs of “at risk” species. The Department reviewed several assessments relevant to the BBWO, as follows:

California Department of Fish and Game- “Species of Special Concern” (SSC) is a Department administrative designation intended to alert biologists, land managers, and others to a species’ declining status and to encourage them to afford these species additional management consideration. SSCs are defined as species, subspecies, or distinct populations of an animal native to California that currently satisfies one or more of the following (not necessarily mutually exclusive) criteria: is extirpated from the State or, in the case of birds, in its primary seasonal or breeding role; is listed as Federally-, but not State-, threatened or endangered; meets the State definition of threatened or endangered but has not formally been listed; is experiencing, or formerly experienced, serious (noncyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for State threatened or endangered status; has naturally small populations exhibiting high susceptibility to risk from any factor(s), that if realized, could lead to declines that would qualify it for State threatened or endangered status (Comrack et al. 2008). The Bird Species of Special Concern (BSSC) list was recently updated based upon objective, standardized methodology and ranking process (Shuford and Gardali 2008). As part of the process, the BBWO was evaluated, scored and ranked against seven criteria along with other nominee taxa and was not found to merit inclusion on the special concern list at that time. Remsen (1978) considered the BBWO for inclusion on the Department’s first BSSC

list but ultimately rejected it, considering it “a scarce species, but probably widely distributed and doing well within its range.”

In Appendix E of the Petition, the Petitioners assessed the BSSC as it relates to the BBWO. Several incorrect interpretations by the Petitioners require clarification, as follows:

The BSSC database for all nominee taxa was not included in the published report. This database is maintained by the Department's Wildlife Branch and will eventually be made available online on the Department's website. The Petitioners incorrectly described Appendix 2 of Shuford and Gardali (2008) as the Department's BSSC nominee list. Rather, it is a master list of all bird taxa in California which had a status designation of conservation concern, at various administrative levels, at the time of publication. BBWO was not included in Appendix 2 because it was not designated as “sensitive” by any of the various entities who assessed the status of birds (e.g., NatureServe, U.S. Fish and Wildlife Service (USFWS), Audubon California).

The BSSC process is an objective and rigorous assessment of the relative conservation status of birds in California. It is open to modification as new information becomes available. The Petition is correct that the BSSC nominee database is dated 2005. Further, the Department agrees that new information is now available on the BBWO in California which may, after assessment, alter the scores and ranking of the BBWO on the BSSC list.

Adjoining State Designations- Oregon Department of Fish and Wildlife: The BBWO is currently classified as "sensitive-vulnerable" statewide on the most recent revised list (ODFW 2008). Oregon Department of Fish and Wildlife define "sensitive" as naturally-reproducing fish and wildlife species, subspecies, or populations which are facing one or more threats to their populations and/or habitats. Implementation of appropriate conservation measures to address the threats may prevent them from declining to the point of qualifying for threatened or endangered status. Vulnerable sensitive species are those facing one or more threats to their populations and/or habitats. Vulnerable species are not currently imperiled with extirpation from a specific geographic area or the state but could become so with continued or increased threats to populations and/or habitats (M. Nugent, pers. comm.). The BBWO is not recognized as “sensitive” by the state of Nevada (Wildlife Action Plan Team 2006.)

Federal Sensitive Species Designations- USFWS: BBWO is not listed as endangered or threatened nor is it a candidate for listing under the federal Endangered Species Act. It was not included on the USFWS Birds of Conservation Concern list (USFWS 2002, 2008).

USFS: BBWO is considered a “Management Indicator Species” (MIS; USDA Forest Service 2007). MIS are selected to address National Forest Management Act requirements related to diversity of plant and animal communities. Species are selected because their population changes may indicate the effects of land management activities. MIS status designation does not convey additional conservation protection from the USFS in and of itself.

Other Designations: NatureServe is a non-profit conservation organization whose mission is to provide the scientific basis for effective conservation action through its network of natural heritage programs; it is a source for information about rare and endangered species and threatened ecosystems. It ranks the BBWO as globally secure; however, at the subnational level (Oregon and California), the species is considered vulnerable; it is classified as critically imperiled in Nevada (NatureServe 2010).

California Partners in Flight, a coalition of government and nongovernmental organizations with a shared goal of “keeping common birds common”, designated the BBWO as a focal species for coniferous forest. Focal species represent a spectrum of habitat characteristics and types and help define which spatial and compositional attributes characterize a healthy ecosystem and guide the development of appropriate management regimes (CPIF 2002).

SUGGESTIONS FOR FUTURE MANAGEMENT (Discussed in the Petition under “*Suggestions for Future Management*” beginning on p. 70)

The Department generally agrees that the Petitioners’ management suggestions would benefit BBWO. The recommendation to “halt or greatly restrict fire suppression activities outside of the urban/wildland interface area”, although potentially beneficial for BBWO and other burned-forest adapted species, is unlikely to be implemented over large areas due to social and political resistance.

DISTRIBUTION MAPS

The Petition included a range map (p.19) which is based on WHR and Siegel et al 2008. The Department found it generally accurate but lacking in detail. The Department prepared two distribution maps: Figure 1. Historic distribution of Black-backed Woodpecker (data sources 1863-1949) and Figure 2. Current distribution of the Black-backed Woodpecker (data sources 1950-2011). They are found at the end of this report.

REFERENCES

- Alcorn, J. R. 1988. The Birds of Nevada. Fairview West Publishing, Fallon, NV.
- American Ornithologists' Union (AOU). 1957. Check-list of North American Birds, 5th ed. Am. Ornithol. Union, Baltimore.
- American Ornithologists' Union (AOU). 1998. Check-list of North American birds. 7th ed. Am. Ornithol. Union, Washington, D.C.
- Avian Knowledge Network. 2011. Avian Knowledge Network: An online database of bird distribution and abundance [web application]. Ithaca, New York. <www.avianknowledge.net> (Accessed: January 3, 2011).
- Bangs, O. 1900. The American three-toed woodpeckers. *Auk* 17:127-142.
- Barlow, C. and W. W. Price. 1901. A list of the land birds of the Placerville-Lake Tahoe Stage Road, central Sierra Nevada Mountains, California. *Condor* 3: 151-184.
- Beal, F.E. 1911. Food of the woodpeckers of the United States. U.S. Department of Agriculture Biological Survey Bulletin 37.
- Beardsley, D., C. Bolsinger, and R. Warbington. 1999. Old growth forests in the Sierra Nevada: By type in 1945 and 1993 and ownership in 1993. USDA Forest Service Research Paper PNW-RP-516. Pacific Northwest Research Station, Portland, Oregon.
- Beedy, E. C. and S. L. Granholm. 1985. Discovering Sierra Birds. Yosemite Natural History Association and Sequoia Natural History Association.
- Belding, L. 1890. Land Birds of the Pacific District. California Academy of Sciences, San Francisco, CA.
- Bent, A.C. 1939. Life histories of North American woodpeckers. *Bull. U.S. Natl. Mus.*, no. 174.
- Bock, C.E. and J. H. Bock 1974. On the geographical ecology and evolution of the three-toed woodpeckers, *Picoides tridactylus* and *P. arcticus*. *American Midland Naturalist* 92:397-405.
- Bonnot, T. W., M. A. Rumble, and J. J. Millspaugh. 2008. Nest success of Black-backed Woodpeckers in forests with mountain pine beetle outbreaks in the Black Hills, South Dakota. *Condor* 110:450-457.

- Bull, E. L., S. R. Peterson, and J. W. Thomas. 1986. Resource partitioning among woodpeckers in northeastern Oregon. USDA Forest Service Pacific Northwest Research Station, Research Note PNW-444. Portland, OR.
- Cahall, R.E., and J.P. Hayes. 2009. Influences of postfire salvage logging on forest birds in the Eastern Cascades, Oregon, USA. *Forest Ecology and Management* 257: 1119–1128.
- California Department of Forestry and Fire Protection. 2010. California's Forests and Rangelands: 2010 Assessment. Sacramento, CA. 341 p.
- California Department of Forestry and Fire Protection. 2003. The Changing California: Forest and Range 2003 Assessment. Sacramento, CA. 198 p.
- California Academy of Sciences (CAS). 2010. Online collections. <<http://research.calacademy.org/om/collections>> (Accessed December 28, 2010).
- California Partners in Flight (CPIF). 2002. Version 1.0. The draft coniferous forest bird conservation plan: A strategy for protecting and managing coniferous forest habitats and associated birds in California (J. Robinson and J. Alexander, lead authors). Point Reyes Bird Observatory, Stinson Beach, CA. <<http://www.prbo.org/calpif/plans.html>>.
- California Partners in Flight (CPIF). 2011. Point count and area search. Avian Knowledge Network. Ithaca, NY. <www.avianknowledge.net>. (Accessed: January 3, 2011).
- Christensen, G.A., S.J. Campbell, and J.S. Fried, tech eds. 2008. California's forest resources, 2001–2005: Five-year forest inventory and analysis report. Gen. Tech. Rep. PNW-GTR-763. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 183 p.
- Comrack, L., B. Bolster, J. Gustafson, D. Steele, and E. Burkett. 2008. Species of Special Concern: A brief description of an important California Department of Fish and Game designation. California Department of Fish and Game, Wildlife Branch, Nongame Wildlife Program Report 2008-03, Sacramento, CA. 4pp.
- Cooper, J. G. 1870. Geological Survey of California, Ornithology, Vol. 1, Land Birds. S.F. Baird, ed.
- Dawson, W .L. 1923. The Birds of California: A Complete, Scientific and Popular Account of the 580 Species and Subspecies of Birds found in the State. South Moulton Company, California.

Dixon, J. S. 1943. Birds of the Kings Canyon National Park area of California. *Condor* 45: 205-219.

Dixon, R. D. and V. A. Saab. 2000. Black-backed Woodpecker (*Picoides arcticus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <<http://bna.birds.cornell.edu/bna/species/509doi:10.2173/bna.509>>

eBird. 2011. California eBird. Avian Knowledge Network. Ithaca, NY. <www.avianknowledge.net>. (Accessed: January 3, 2011).

Ehrlich, P.R., D. S. Dobkin, and D. Wheye. 1988. The Birder's Handbook, A Field Guide to the Natural History of North American Birds. Simon & Schuster Inc. New York, NY.

Franklin, J. F., and J. A. Fites-Kaufmann. 1996. Assessment of late-successional forests of the Sierra Nevada In W. R. Center (Ed.), Sierra Nevada Ecosystem Project, final report to Congress, Vol. II, assessments and scientific basis for management options. (pp. 627–662): University of California, Davis.

Gaines, D. 1992. Birds of Yosemite and the East Slope, 2nd ed. Artemisia Press, Lee Vining, CA.

Girardin, M.P., A.A. Ali, C. Carcaillet, M. Mudelsee, I. Drobyshev, C. Hely, and Y. Bergeron. 2009. Heterogeneous response of circumboreal wildfire risk to climate change since the early 1900s. *Global Change Biology* 15:2751–2769.

Goggans, R., R. D. Dixon, and L. C. Seminara. 1989. Habitat use by Three-toed and Black-backed Woodpeckers. Nongame Rep. 87302. Oregon Dept. Fish and Wildl.

Grinnell, J. 1915. A distributional list of the birds of California. *Pac. Coast Avifauna* 11.

Grinnell, J., and T. I. Storer. 1924. *Animal Life in the Yosemite*. Univ. Calif. Press, Berkeley.

Grinnell, J., J. Dixon, and J. M. Linsdale. 1930. *Vertebrate Natural History of a Section of Northern California through the Lassen Peak Region*. U.C. Press, Berkeley.

Grinnell, J., and A. H. Miller. 1944. The distribution of the birds of California. *Pac. Coast Avifauna* 27.

Hanson, C. T. 2007. Post-fire management of snag forest habitat in the Sierra Nevada. PhD. dissertation. University of California, Davis.

Hanson, C. T. and M. P. North. 2008. Postfire woodpecker foraging in salvage-logged and unlogged forests of the Sierra Nevada. *Condor* 110:777–782.

Harris, S.W. 2005. *Northwestern California Birds*, 3rd ed. Living Gold Press, Klamath River, CA..

Henshaw, H. W. 1877. Report on the Ornithology of portions of Nevada and California. Ann. Rep. Geog. Surv. West 100th mer. By George M. Wheeler. App. N. N. of the AM. Rep. Chief of Engineers for 1877.

Henshaw, H. W. 1880. Ornithological report from observations and collections made in portions of California, Nevada and Oregon. Ann. Rep. Geog. Survey West 100th Mer. by George M. Wheeler. App. L. of the Ann Rep Chief Engineers for 1879.

Hoyt, J. S. and S. J. Hannon. 2002. Habitat associations of Black-backed and Three-toed Woodpeckers in the boreal forest of Alberta. *Canadian Journal of Forest Research* 32:1881–1888.

Hutto, R. L. 1995. Composition of bird communities following stand-replacement fires in Northern Rocky Mountain (U.S.A.) conifer forests. *Conservation Biology* 9:1041–1058.

Hutto, R. L. 2008. The ecological importance of severe wildfires: Some like it hot. *Ecological Applications* 18:1827–1834.

Hutto, R. L. and S. M. Gallo. 2006. The effects of postfire salvage logging on cavity-nesting birds. *Condor* 108:817–831.

Institute for Bird Populations (IBP). 2011. Black-backed Woodpecker monitoring and management. <http://www.birdpop.org/Sierra/bbwo_results.htm> (Accessed: January 3, 2011).

Keeler, C. A. 1899. *Bird Notes Afield, A series of essays on the birds of California*. D.P. Elder and Morgan Shepard, San Francisco, CA.

Kreisel, K. J. and S. J. Stein. 1999. Bird use of burned and unburned coniferous forests during winter. *Wilson Bulletin* 111:243–250.

Leahy, C. W. 2004. *The Birdwatcher's Companion to North American Birdlife*. Princeton University Press, Princeton, NJ.

Macaulay Library of Natural Sounds, Cornell Lab of Ornithology. 2010. <<http://macaulaylibrary.org/index.do>> (Accessed December 28, 2010).

- Marshall, D. B., M.G. Hunter, A. L. Contreras., eds. 2003. Birds of Oregon, A General Reference. Oregon State University Press, Corvallis, Oregon.
- McKenzie, D., Z. Gedalof, D.L. Peterson, and P. Mote. 2004. Climatic change, wildfire, and conservation. *Conservation Biology* 18: 890–902.
- Michel, N., DeSante, D.F., Kaschube, D.R., and Nott, M.P. 2011. The Monitoring Avian Productivity and Survivorship (MAPS) program annual reports, 1989-2006. NBII/MAPS Avian Demographics Query Interface. <<http://www.birdpop.org/nbii2006/NBIIHome.asp>> (Accessed January 2011).
- Murphy, E.C. and W. A. Lehnhausen. 1998. Density and foraging ecology of woodpeckers following a stand-replacement fire. *J. Wild. Manage.* 62: 1359-1372.
- Museum of Vertebrate Zoology (MVZ). 2010. Online Collections. <<http://mvz.berkeley.edu/Collections.html>> (Accessed December 28, 2010).
- Nappi, A., P. Drapeau, J. Giroux, and J. L. Savard. 2003. Snag use by foraging Black-backed Woodpeckers (*Picoides arcticus*) in a recently burned eastern boreal forest. *Auk* 120:505–511.
- Nappi, A., and P. Drapeau. 2009. Reproductive success of the Black-backed Woodpecker (*Picoides arcticus*) in burned boreal forests: Are burns source habitats? *Biological Conservation* 142:1381–1391.
- National Audubon Society. 2010. The Christmas Bird Count historical results [Online]. <<http://www.christmasbirdcount.org>> (Accessed January 3, 2011).
- NatureServe online <<http://www.natureserve.org/aboutUs/index.jsp>> (Accessed November 30, 2010)
- Oregon Department of Fish and Wildlife (ODFW). December 2008. Oregon Department of Fish and Wildlife sensitive species: Frequently asked questions and sensitive species list. ODFW website: http://www.dfw.state.or.us/wildlife/diversity/species/docs/SSL_by_category.pdf
- Orr, R. T. and J. Moffitt. 1971. Birds of the Lake Tahoe Region. California Academy of Sciences, San Francisco, CA.
- Parisien, M. and M.A. Moritz. 2009. Environmental controls on the distribution of wildfire at multiple spatial scales. *Ecological Monographs* 79:127–154.
- Pierson, J. C., F. W. Allendorf, V. Saab, P. Drapeau, M.K. Schwartz. 2010. Do male and female Black-backed Woodpeckers respond differently to gaps in habitat? *Evolutionary Applications* 3:263–278.

Point Reyes Bird Observatory (PRBO). 2011. Point Counts. Avian Knowledge Network. Ithaca, NY. <www.avianknowledge.net>. (Accessed: January 3, 2011).

Purcell, K. L. 2010. Black-backed Woodpecker use of unburned forests in the southern Sierra Nevada. The Institute for Bird Populations. Presentation at the Black-backed Woodpecker Technical Workshop, 11/18-19/2010, McClellan, CA.

Raphael, M. G. and M. White. 1984. Use of snags by cavity-nesting birds in the Sierra Nevada. Wildlife Monographs No. 86:3–66.

Remsen, J. V., Jr. 1978. Bird species of special concern in California: An annotated list of declining or vulnerable bird species. Nongame Wildl. Invest., Wildl. Mgmt. Branch Admin. Rep. 78-1, Calif. Dept. Fish and Game, Sacramento, CA.

Rich, T. D., C. J. Beardmore, H. Berlanga, P. J. Blancher, M. S. W. Bradstreet, G. S. Butcher, D. W. Demarest, E. H. Dunn, W. C. Hunter, E. E. Iñigo-Elias, J. A. Kennedy, A. M. Martell, A. O. Panjabi, D. N. Pashley, K. V. Rosenberg, C. M. Rustay, J. S. Wendt, T. C. Will. 2004. Partners in Flight North American Landbird Conservation Plan. Cornell Lab of Ornithology. Ithaca, NY. Partners in Flight website.< http://www.partnersinflight.org/cont_plan/> (VERSION: March 2005).

Richardson, T. W. 2003. First records of Black-backed Woodpecker (*Picoides arcticus*) nesting in Nevada. Great Basin Birds 6:1 pp. 52–55.

Rodrick, E. and R. Milner, eds. 1991. Management recommendations for Washington's priority habitats and species. Washington Department of Wildlife, Wildlife Management, Fish Management, and Habitat Management Divisions.

Rosenberg, K. V. 2004. Partners in Flight continental priorities and objectives defined at the State and Bird Conservation Region levels, California. Cornell Lab of Ornithology, Ithaca, NY.

Russell, R. E., V. A. Saab, and J. G. Dudley. 2007. Habitat-suitability models for cavity-nesting birds in a postfire landscape. Journal of Wildlife Management 71:2600–2611.

Saab, V. A. and J. G. Dudley. 1998. Responses of cavity-nesting birds to stand-replacement fire and salvage logging in Ponderosa Pine/Douglas-fir forests of southwestern Idaho. (Research Paper RMRS-RP-11). Fort Collins: USDA Forest Service Rocky Mountain Research Station.

Saab, V.A., R. Brannon, J. Dudley, L. Donohoo, D. Vanderzanden, V. Johnson, and H. Lachowski. 2002. Selection of fire created snags at two spatial scales by cavity nesting birds In P.J. Shea, W.F. Laudenslayer Jr., B. Valentine, C.P. Weatherspoon, and T.E. Lisle (eds.), Proceedings of the symposium on the

ecology and management of dead wood in western forests, November 2–4, 1999, Reno, Nevada. USDA Forest Service General Technical Report PSW-GTR-181, pp. 835-848.

Saab, V. A., R. E. Russell, and J. G. Dudley. 2007. Nest densities of cavity-nesting birds in relation to postfire salvage logging and time since wildfire. *Condor* 109:97–108.

Saab, V.A., R.E. Russell, and J.G. Dudley. 2009. Nest-site selection by cavity-nesting birds in relation to postfire salvage logging. *Forest Ecology and Management* 257:151–159.

Sauer, J. R., J. E. Hines, and J. Fallon. 2008. The North American Breeding Bird Survey, results and analysis 1966 - 2007. Version 5.15.2008. USGS Patuxent Wildlife Research Center, Laurel, MD.

Settingington, M. A., I. D. Thompson, W. A. Montevecchi. 2000. Woodpecker abundance and habitat use in mature balsam fir forests in Newfoundland. *Journal of Wildlife Management* 64:335–345.

Shuford, W. D., and T. Gardali, editors. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

Siegel, R., J. Saracco, and R. Wilkerson. 2010. Black-backed Woodpecker distribution, ecology, and conservation in the Sierra presentation: Black-backed Woodpecker MIS Monitoring on Sierra Nevada National Forests. The Institute for Bird Populations. Presentation at the Black-backed Woodpecker Technical Workshop, 11/18-19/2010, McClellan, CA.

Siegel, R. B., J. F. Saracco, and R. L. Wilkerson. 2010. Management Indicator Species (MIS) surveys on Sierra Nevada national forests: Black-backed Woodpecker. 2009 annual report. Report to USFS Pacific Southwest Region. The Institute for Bird Populations, Point Reyes Station, CA.

Siegel, R.B., R. L. Wilkerson, and D. L. Mauer 2008. Black-backed Woodpecker (*Picoides arcticus*) surveys on Sierra Nevada National Forests: 2008 pilot study final report in fulfillment of Forest Service agreement No. 08-CS-11052005-201 The Institute for Bird Populations, Point Reyes Station, CA.

Siegel, R. B., and D. F. DeSante. 1999. The draft avian conservation plan for the Sierra Nevada bioregion: Conservation priorities and strategies for safeguarding Sierra bird populations, version 1.0. Institute for Bird Populations report to California Partners in Flight. < www.prbo.org/calpif/htmldocs/sierra.html >

Small, A. 1994. California Birds: Their Status and Distribution. Ibis Publ., Vista, CA.

Smucker, K. M., R. L. Hutto, and B. M. Steele. 2005. Changes in bird abundance after wildfire: Importance of fire severity and time since fire. *Ecological Applications* 15:1535–1549.

Spring, L. W. 1965. Climbing and pecking adaptations in some North American woodpeckers. *Condor* 67: 457-488.

Stephens, S.L., R.E. Martin, and N.E. Clinton. 2007. Prehistoric fire area and emissions from California's forests, woodlands, shrublands, and grasslands. *Forest Ecology and Management* 251:205–216.

Sumner, L. and J. S. Dixon. 1953. Birds and mammals of the Sierra Nevada with records from Sequoia and Kings Canyon National Parks. University of California Press, Berkeley, CA.

U.S.D.A. Forest Service. 2004. Sierra Nevada Forest Plan amendment, record of decision. USDA Forest Service, Pacific Southwest Region, Vallejo, CA.

U.S.D.A. Forest Service. 2007. Sierra Nevada forests management indicator species: Amendment FEIS. USDA Forest Service, Pacific Southwest Region.

U.S. D.A. Forest Service. 2011. Sierra Nevada Avian Monitoring Information. Avian Knowledge Network. Ithaca, NY. <www.avianknowledge.net>. (Accessed: January 3, 2011).

U.S. Fish and Wildlife Service (USFWS). 2002. Birds of Conservation Concern 2002. Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. 99 pp.

U.S. Fish and Wildlife Service (USFWS). 2008. Birds of Conservation Concern 2008. United States Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. 85 pp. [Online version available at <<http://www.fws.gov/migratorybirds/>>]

U.S. Geological Survey (USGS BBL). 2010. Bird Banding Lab <<http://www.pwrc.usgs.gov/bbl/homepage/long3930.cfm>>. (Accessed December 15, 2010).

U.S. Geological Survey (USGS). 2011. Breeding Bird Survey. <<http://www.pwrc.usgs.gov/bbs>> (Accessed: January 3, 2011).

Van Tyne, J. 1926. An unusual flight of Arctic Three-toed Woodpeckers. *Auk* 43: 469-474.

Vierling, K. T., L. B. Lentile, and N. Nielsen-Pincus. 2008. Preburn characteristics and woodpecker use of burned coniferous forests. *Journal of Wildlife Management* 72:422–427.

West, J. D. and J. M. Speirs. 1959. The 1956-1957 invasion of three-toed woodpeckers. *Wilson Bull.* 71:348-363.

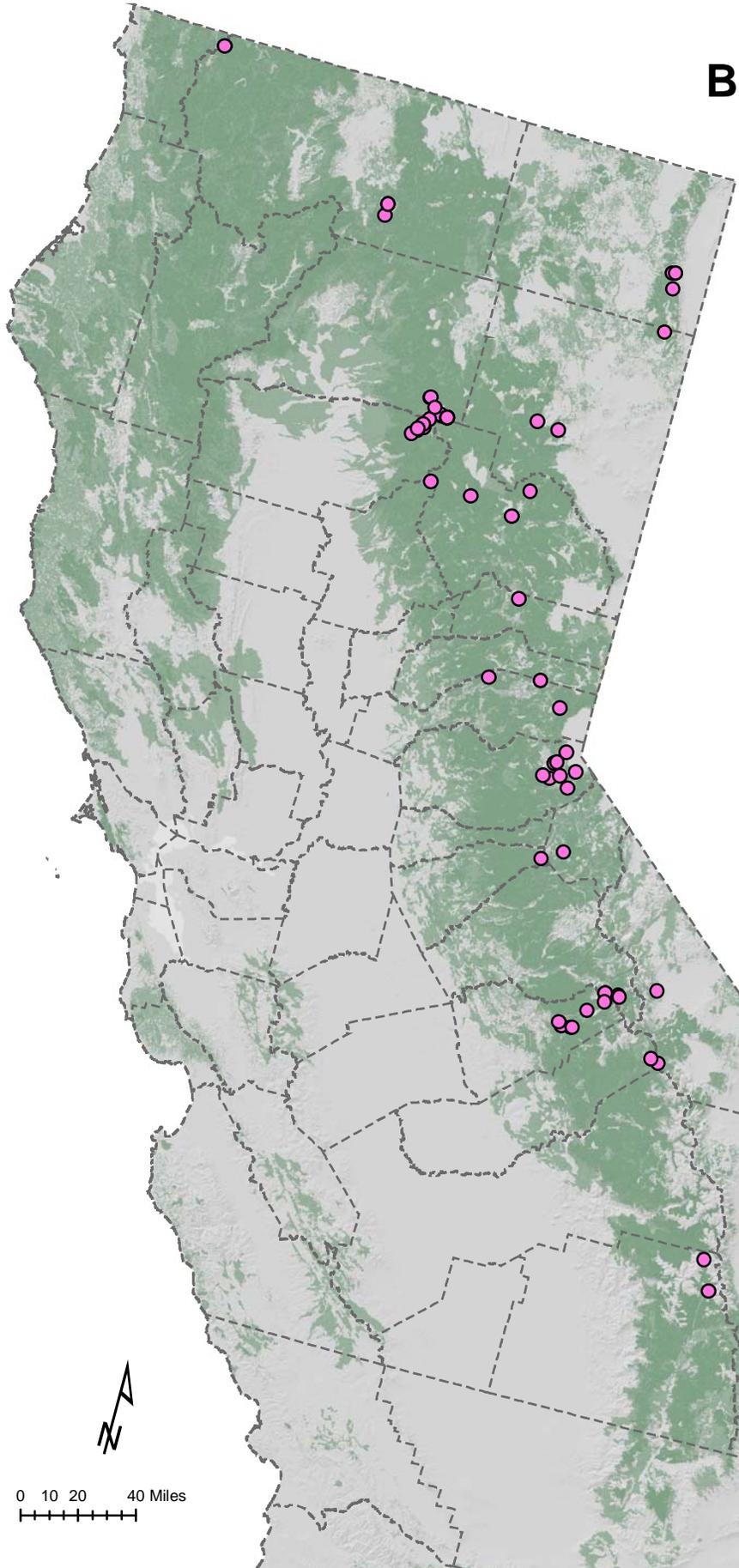
Wildlife Action Plan Team. 2006. Nevada Wildlife Action Plan. Nevada Department of Wildlife, Reno.

Yosemite National Park. 2004. Final Yosemite Fire Management Plan Environmental Impact Statement.

Yunick, R. P. 1985. A review of recent irruptions of the Black-backed Woodpecker and Three-toed Woodpecker in eastern North America. *J. Field Ornithol.* 56:138-152.

Zielinski, W. J., R. L. Truex, F. V. Schlexer, L. A. Campbell, and C. Carroll. 2005. Historical and contemporary distributions of carnivores in forests of the Sierra Nevada, California, USA. *Journal of Biogeography*, 32:1385–1407.

Figure I Historic Distribution of Black-backed Woodpecker (*Picoides arcticus*)



- Historic Data Sources (1863 - 1949)
- Conifer

Notes:

Primary Black-backed Woodpecker data sources:
Barlow and Price 1901; Belding 1890; Bent 1939;
CAS 2010; Dixon 1943; Grinnell et al. 1930;
Grinnell and Storer 1924; Grinnell and Miller 1944;
MVZ 2010; Sumner and Dixon 1953.

Vegetation data sources:
FRAP; Multi-source Land Cover Data 2002, Version 2
UC Santa Barbara, Land Cover/Vegetation (GAP) 1997



0 10 20 40 Miles



Figure 2 Current Distribution of Black-backed Woodpecker (*Picoides arcticus*)

