NOTICE OF FINDINGS
Black-backed Woodpecker
(*Picoides arcticus*)

NOTICE IS HEREBY GIVEN that the California Fish and Game Commission ("Commission"), at its November meeting in La Quinta, California, made a finding pursuant to Fish and Game Code section 2075.5, that the petitioned action to add the black-backed woodpecker *(Picoides arcticus)* to the list of threatened or endangered species under the California Endangered Species Act ("CESA") (Fish & G. Code, § 2050 et seq.) is not warranted. (See also Cal. Code Regs., tit. 14, § 670.1, subd. (i).)

I. Background and Procedural History

On October 1, 2010, the Office of the 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) ("Petition") from the John Muir Project of Earth Island Institute and Center for Biological Diversity ("Petitioners"). (Cal. Reg. Notice Register 2010, No. 44-Z, p. 1851.) The Commission, pursuant to Fish and Game Code section 2073, referred the Petition to the Department of Fish and Wildlife ("CDFW") for its evaluation and recommendation. (Fish & G. Code, § 2073.) On February 15, 2011, CDFW submitted its "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" ("Petition Evaluation Report") to the Commission. CDFW recommended in its Petition Evaluation Report that the Petition be rejected pursuant to Fish and Game Code section 2073.5, subdivision (a)(1). (*See also* Cal. Code Regs., tit. 14, § 670.1, subd. (d).)

On April 6, 2011, at its meeting in Folsom, California, the Commission took up consideration of the Petition and received public testimony on the matter. However, in light of information dated March 24, 2011 submitted by Petitioners to the Commission, the Commission voted to table consideration as to whether the petitioned action may be warranted until receipt of an evaluation by CDFW of the March 24, 2011 information.

On June 29, 2011, at its meeting in Stockton, California, the Commission received an update from CDFW that its evaluation of the March 24, 2011 information from Petitioners would be completed around August. CDFW also informed the Commission of additional information received from Petitioners dated April 15, 2011 and June 17, 2011, and the United States Forest Service ("USFS") dated May 17, 2011.

On August 3, 2011, at its meeting in Sacramento, California, the Commission received from CDFW its evaluation of supplemental material from Petitioners dated March 24, 2011 and April 15, 2011, and CDFW's recommendation remained the same, that the Petition did not contain sufficient information to indicate that the Petitioned action may be warranted. The Commission received public testimony on the Petition and voted to table consideration as to whether the petitioned action may be warranted until receipt of an additional evaluation by CDFW of supplemental material from Petitioners dated June 17, 2011, July 1, 2011, and July 29, 2011.

On November 16, 2011, at its meeting in Santa Barbara, California, the Commission received from CDFW its second evaluation of supplemental material. This second evaluation reviewed information from Petitioners dated June 17, 2011, July 1, 2011, and July 29, 2011, and information from USFS dated May 17, 2011. The Commission received public testimony and again voted to table consideration as to whether the petitioned action may be warranted until the following Commission meeting to evaluate additional new information from Petitioners dated November 10 and November 11, 2011.

On December 15, 2011, at its meeting in San Diego, California, the Commission received public testimony and voted to accept the Petition and advance the black-backed woodpecker to the candidacy stage. In reaching its decision, the Commission considered the Petition, CDFW's Petition Evaluation Report, Petitioners' information submittals mentioned above, CDFW's evaluations of such information, public comment, and other relevant information, and determined based on evidence in the record of proceedings that the Petition contained sufficient information to indicate that the petitioned action may be warranted. (Cal. Code Regs., tit. 14, § 670.1, subd. (e); see also Cal. Reg. Notice Register 2012, No. 1-Z, p. 18.) The Commission also took emergency action pursuant to the Fish and Game Code and the Administrative Procedure Act (Gov. Code, § 11340 et seq.), authorizing take of black-backed woodpecker as a candidate species under CESA, subject to various terms and conditions. (See Fish & G. Code, §§ 240, 2084, adding Cal. Code Regs., tit. 14, § 749.7; Cal. Reg. Notice Register 2012, No. 3-Z, p. 62.) Although the emergency authorization would have been repealed by operation of law on July 6, 2012, it was set aside approximately five weeks earlier on May 29, 2012, as part of a settlement in response to a lawsuit filed against the Commission.

Following published notice of black-backed woodpecker's designation as a candidate species under CESA, CDFW began preparing a status review of black-backed woodpecker. As part of that effort, CDFW solicited data, comments, and other information from interested members of the public, state and federal agencies, and the scientific and academic community. CDFW also submitted a preliminary draft of its status review to an independent peer review by scientists with expertise relevant to the status of the black-backed woodpecker in order to critique the scientific validity of the report. (Fish & G. Code, §§ 2074.4, 2074.8; Cal. Code Regs., tit. 14, § 670.1, subd. (f)(2).)

Meanwhile, on March 6, 2013, the Commission at its meeting in Mount Shasta, California, received from Petitioners' their own status review of the black-backed woodpecker titled "Black-backed Woodpecker (*Picoides arcticus*) Status Review under the California Endangered Species Act" dated February 11, 2013 ("Petitioners' Status Review"). (Cal. Code Regs., tit. 14, 670.1, subd. (h)(2).)

Then on May 22, 2013, CDFW submitted to the Commission at its meeting in Los Angeles, California, CDFW's status review: "A Status Review of the Black-backed Woodpecker (*Picoides arcticus*) in California" ("CDFW Status Review") wherein CDFW recommended to the Commission that based on the best science available to CDFW designating black-backed woodpecker as a threatened or endangered species under CESA is not warranted. (Fish & G. Code, § 2074.6; Cal. Code Regs., tit. 14, § 670.1, subd. (f).) Following receipt, the Commission made CDFW's Status Review available to the public, inviting further review and input. (*Id.*, § 670.1, subd. (g).)

At the following Commission meeting on June 26, 2013, in Sacramento, California, the Commission received a presentation by CDFW of its status review and a presentation by Petitioners of their status review. The Commission also received public comment. The Commission then scheduled its consideration and deliberation of the Petition for the following meeting in August to allow time to consider information submitted by Petitioners dated June 11, 2013.

Then on August 7, 2013, at its meeting in San Luis Obispo, California, the Commission considered final action regarding the Petition. In taking final action on the Petition, the Commission considered the Petition, public comment, CDFW's Petition Evaluation Report, Petitioners' Status Review, CDFW's Status Review, and other information received by the Commission over the almost three years since commencement of these proceedings. Following public comment and deliberation, the Commission determined that designating black-backed woodpecker as an endangered or threatened species under CESA is not warranted. (Fish & G. Code, § 2075.5(1); Cal. Code Regs., tit. 14, § 670.1, subd. (i)(2).)

II. Statutory and Legal Framework

The Commission's determination that listing black-backed woodpecker is not warranted marks the end of proceedings under CESA prescribed by the Fish and Game Code and controlling regulation. (See generally Fish & G. Code, § 2070 et seq.; Cal. Code Regs., tit. 14, § 670.1.) The Commission, as established by the California Constitution, has exclusive statutory authority under California law to designate endangered, threatened, and candidate species under CESA. (Cal. Const., art. IV, § 20, subd. (b); Fish & G. Code, § 2070.)[1]

The CESA listing process for black-backed woodpecker began in the present case with the Petitioners' submittal of the Petition to the Commission in October 2010. (Cal. Reg. Notice Register 2010, No. 44-Z, p. 1851.) The regulatory process that ensued is described in some detail in the preceding section above, along with related references to the Fish and Game Code and controlling regulation. The CESA listing process generally is also described in some detail in published appellate case law in California, including:

- *Mountain Lion Foundation v. California Fish and Game Commission* (1997) 16 Cal.4th 105, 114-116;
- *California Forestry Association v. California Fish and Game Commission* (2007) 156 Cal.App.4th 1535, 1541-1542;
- *Center for Biological Diversity v. California Fish and Game Commission* (2008) 166 Cal.App.4th 597, 600; and
- *Natural Resources Defense Council v. California Fish and Game Commission* (1994) 28 Cal.App.4th 1104, 1111-1116.

The "is not warranted" determination at issue here for black-backed woodpecker stems from Commission obligations established by Fish and Game Code section 2075.5. Under this provision, the Commission is required to make one of two findings for a candidate species at the

[1] The Commission, pursuant to this authority, may add, remove, uplist, downlist, or choose not to list 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 also Cal. Code Regs., tit. 14, § 670.1, subd. (i)(1)(A)-(C) and (2).) In practical terms, any of these actions is commonly referred to as subject to CESA's "listing" process.

end of the CESA listing process; namely, whether the petitioned action is warranted or is not warranted. Here with respect to black-backed woodpecker, the Commission made the finding under section 2075.5(1) that the petitioned action is not warranted.

The Commission was guided in making this determination by statutory provisions and other controlling law. The Fish and Game Code, for example, defines an endangered species under CESA as "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.)

Similarly, the Fish and Game Code defines a threatened species under CESA as "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 this chapter." *(Id.*, § 2067.)

The Commission also considered Title 14, section 670.1, subdivision (i)(1)(A), of the California Code of Regulations in making its determination regarding black-backed woodpecker. This provision provides, in pertinent part, that a species shall be listed as endangered or threatened under CESA if the Commission determines that the species' continued existence is in serious danger or is threatened by any one or any combination of the following factors:

1. Present or threatened modification or destruction of its habitat;
2. Overexploitation;
3. Predation;
4. Competition;
5. Disease; or
6. Other natural occurrences or human-related activities.

Fish and Game Code section 2070 provides similar guidance. This section provides that the Commission shall add or remove species from the list of endangered and threatened species under CESA only upon receipt of sufficient scientific information that the action is warranted. Similarly, CESA provides policy direction not specific to the Commission per se, indicating that all state agencies, boards, and commissions shall seek to conserve endangered and threatened species and shall utilize their authority in furtherance of the purposes of CESA. (Fish & G. Code, § 2055.) This policy direction does not compel a particular determination by the Commission in the CESA listing context. Nevertheless, "'[l]aws providing for the conservation of natural resources' such as the CESA 'are of great remedial and public importance and thus should be construed liberally." (*California Forestry Association v. California Fish and Game Commission, supra,* 156 Cal. App.4th at pp. 1545-1546, citing *San Bernardino Valley Audubon Society v. City of Moreno Valley* (1996) 44 Cal.App.4th 593, 601; Fish & G. Code, §§ 2051, 2052.)

Finally in considering these factors, CESA and controlling regulation require the Commission to actively seek and consider related input from the public and any interested party. (See, e.g., *Id.*, §§ 2071, 2074.4, 2078; Cal. Code Regs., tit. 14, § 670.1, subd. (h).) The related notice obligations and public hearing opportunities before the Commission are also considerable. (Fish & G. Code, §§ 2073.3, 2074, 2074.2, 2075, 2075.5, 2078; Cal. Code Regs., tit. 14, § 670.1,

subds. (c), (e), (g), (i); see also Gov. Code, § 11120 et seq.) All of these obligations are in addition to the requirements prescribed for CDFW in the CESA listing process, including an initial evaluation of the petition and a related recommendation regarding candidacy, and a review of the candidate species' status culminating with a report and recommendation to the Commission as to whether listing is warranted based on the best available science. (Fish & G. Code, §§ 2073.4, 2073.5, 2074.4, 2074.6; Cal. Code Regs., tit. 14, § 670.1, subds. (d), (f), (h).)

III. Final Determination by the Commission

The Commission has weighed and evaluated information for and against designating black-backed woodpecker as an endangered or threatened species under CESA. This information includes scientific and other general evidence in the Petition; CDFW's Petition Evaluation Report; CDFW's Status Review; CDFW's related recommendations; Petitioners' Status Review; written and oral comments received from members of the public, the regulated community, various public agencies, and the scientific community; and other evidence included in the Commission's record of proceedings. (*See* sections I and IV of this Notice of Findings.) Based upon the evidence in the record the Commission has determined that the best scientific information available indicates that the continued existence of the black-backed woodpecker is not in serious danger or threatened by present or threatened modifications or destruction of the species' habitat, overexploitation, predation, competition, disease, or other natural occurrences or human-related activities, where such factors are considered individually or in combination. (See generally Cal. Code Regs., tit. 14, § 670.1, subd. (i)(1)(A); Fish & G. Code, §§ 2062, 2067.) The Commission determines for the same reason that there is not sufficient scientific information to indicate that designating the black-backed woodpecker as an endangered or threatened species under CESA is warranted at this time and that with adoption and publication of these findings the black-backed woodpecker for purposes of its legal status under CESA shall revert to its status prior to the Commission's acceptance of the Petition. (Fish & G. Code, §§ 2070, 2075.5(2); Cal. Code Regs., tit. 14, § 670.1, subd. (i)(2).)

IV. Factual and Scientific Bases for the Commission's Final Determination

The factual and scientific bases for the Commission's determination that designating black-backed woodpecker as an endangered or threatened species under CESA is not warranted are set forth in detail in the Commission's record of proceedings, summarized here.

Included in the Commission's record are: the Petition, CDFW's Petition Evaluation Report, CDFW's Status Review, Petitioners' Status Review, and other information submittals from various entities including: CDFW (dated June 30, 2011 and September 30, 2011), Petitioners (including but not limited to information dated March 24, 2011, April 15, 2011, June 17, 2011, July 1, 2011, July 29, 2011, November 11, 2011, June 1, 2012, August 21, 2012, March 27, 2013, June 11, 2013, and July 26, 2013), the USFS (dated May 17, 2011 and May 31, 2012), and the California Department of Forestry and Fire Protection (dated June 4, 2012).

The Commission determines that the continued existence of black-backed woodpecker in the State of California is not in serious danger or threatened by one or a combination of the following factors:

1. Present or threatened modification or destruction of its habitat;
2. Overexploitation;

3. Predation;
4. Competition;
5. Disease; or
6. Other natural occurrences or human-related activities.

The Commission also determines that the information in the Commission's record constitutes the best scientific information available and establishes that designating black-backed woodpecker as an endangered or threatened species under CESA is not warranted. Similarly, the Commission determines that the black-backed woodpecker is not in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes. And that the black-backed woodpecker is also unlikely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by CESA.

The Commission's record of proceedings contains relatively little evidence concerning overexploitation, predation, competition, or disease affecting the black-backed woodpecker. As a result, there is insufficient information available to determine if the black-backed woodpecker's continued existence is in serious danger or threatened by overexploitation, predation, competition, or disease, either individually or in combination. The scant evidence in the Commission's record on these factors merely provides examples of factors that could affect an individual black-backed woodpecker. (*See e.g.* CDFW Status Review.) However, that evidence does not explain if those factors have any actual effect on the black-backed woodpecker's population or continued existence.

The bulk of evidence in the record before the Commission falls under the remaining two regulatory factors: present or threatened modification or destruction of the black-backed woodpecker's habitat, and other natural occurrences or human-related activities. Specifically, the bulk of evidence submitted pertains to: burned forest habitat creation, burned forest habitat modification, and population size. These findings address those topics in detail. (Nevertheless, the issues highlighted here and detailed in the following section represent only a portion of the complex issues aired and considered by the Commission during the CESA listing process for the black-backed woodpecker. Similarly, the issues addressed in these findings represent some, but not all of the evidence, issues, and considerations affecting the Commission's final determination. Other issues aired before and considered by the Commission are addressed in detail in the record before the Commission.)

A. Burned Forest Habitat Creation

Black-backed woodpeckers occur at their highest densities in recently burned forests for the first five to eight years following a fire and there is considerable evidence in the Commission's record pertaining to the creation of such habitat. The following three factors feature prominently in the record as affecting the creation of burned forest habitat: fire suppression, pre-fire fuel treatment, and climate change. However, as discussed more fully below, based on the information before it, the Commission cannot conclude that these three factors affecting the creation of burned forest habitat (i.e. fire suppression, pre-fire fuel treatment, and climate change), either by themselves or in combination with each other or other threats, has caused the black-backed woodpecker's continued existence to be in serious danger or threatened such that listing is warranted. Furthermore, although black-backed woodpeckers inhabit unburned, green forests, there is little scientific information in the record concerning the role of such green forest as it

pertains to the black-backed woodpecker's continued existence, in part because they are more abundant on a per acre basis, and are easier to study because of increased visibility, in burned habitats. More particularly, there is little information concerning the extent to which the presence of burnt forest is a requisite for the bird's continued existence.

1. Fire Suppression

Since the early 1900s fire suppression has occurred in California's forests thereby reducing the frequency and extent of forest fires as compared to levels that existed prior to large scale European American settlement in the early 1850s. Nevertheless, there has been no detected decrease in the black-backed woodpecker's range nor any detected decrease in the bird's population (subjective descriptions of abundant versus rare are discussed below) (CDFW Status Review.) Moreover, there is an unsustainable fire deficit in California (i.e. for several decades forest fuels have been accumulating more rapidly than they are being removed by wildland fire or forest management practices). And since the 1980s there has been an increase in forest fire frequency, burned area, and extent of high severity fire (high severity burn areas appear to be preferred by black-backed woodpeckers) (*See e.g.* CDFW Status Review.)

Petitioners take issue with the published literature that indicates an increasing trend in fire frequency and cite to an unpublished study concerning only fire severity. (*See* Hanson and Odion (2013).[2]) Assuming the study is accurate and there is no increasing trend in fire severity, one can infer that there have been more high severity fires in the early part of the studied time period than previously estimated i.e. montane conifer forest that was not identified in more recent vegetation maps used to identify the trend burned at a high severity. (Hanson and Odion (2013).[3]) This study then raises two questions, could an increasing trend in fire severity have started earlier than previously estimated, or have there been more high severity fires throughout the century than previously estimated? Regardless of there being an increasing trend in forest fires or more forest fires than previously estimated, there is recognition of a severe fire deficit in California's forests (i.e. for several decades forest fuels have been accumulating more rapidly than they are being removed by wildland fire or forest management practices). Moreover, there remains nearly universal recognition of an increasing trend in western North American forest fire frequency and size in the published literature. (CDFW Status Review; Westerling et. al 2006[4].)

Related to the topic of fire severity, the Commission places little weight on the fact that CDFW changed its position regarding future fire frequency and intensity between the petition evaluation stage and preparation of the status review. At the petition evaluation stage, CDFW is statutorily charged with assessing the petition on its face, and in relation to other information in CDFW's files or that it receives. (Fish & G. Code, § 2073.5) However, after the Commission accepted the Petition and the black-backed woodpecker became a candidate, CDFW was required to solicit data and comments on the Petition and to prepare a status review based on the best scientific information available. (Fish & G. Code, §§ 2074.4, 2074.6; Cal. Code Regs., tit. 14, § 670.1 subd. (f).) It appears CDFW had limited information at the petition evaluation stage,

[2] Hanson, C.T., and D.C. Odion. 2013. Is fire severity increasing in the Sierra Nevada mountains, California, USA? (Authors' in-press copy)
[3] Hanson, C.T., and D.C. Odion. 2013. Is fire severity increasing in the Sierra Nevada mountains, California, USA? *In press* in International Journal of Wildland Fire.
[4] Westerling, A.L., H.G. Hidalgo, D.R. Cayan, and T. W. Swetnam. 2006. Warming and earlier spring increase western U.S. forest wildfire activity. Science 313. DOI:10.1126/science.1128834

namely the information it received or possessed. That limited information lacked the evidence concerning the increased frequency and severity in fires considered by CDFW during the status review. Accordingly, the Commission is reassured that the process was followed in the sense that CDFW would change its scientific opinion on a particular issue after receiving new, contrary information.

2. Pre-fire Fuel Treatment

Fire treatment, or fuel treatment, commonly in the form of thinning forests is also a factor that could affect the creation and quality of burned forest habitat. Information in the record indicates that thinning trees pre-fire can reduce the potential creation of burned forest habitat for the black-backed woodpecker by preventing high-severity fires, and can reduce the quality of burned forest habitat by reducing snag density. However, the record lacks evidence indicating such thinning is occurring in a quantity to significantly affect the future creation of the type of burned forest habitat in which black-backed woodpeckers appear in high densities. In fact, if the current rate of thinning since 2004 continues, less than 5% of the forest would be thinned over a 20-year period. (CDFW Status Review.) Petitioners highlight one USFS Publication in which the author recommends fuels should be reduced by 437,000 acres/year; a 14-fold increase over the current rate. (North 2012 [Chpt. 15].[5]) The recommendation to reduce fuels by 437,000 acres/year is intended, in part, to mimic the historic fires regimes of pre-European American settlement i.e. pre 1850s before fire suppression. However, this is only a recommendation from a USFS scientist who recognizes that future implementation will depend on scientific, social, and budgetary factors.

3. Climate Change

Climate change is the third major factor that could affect the creation of burned forest habitat. The Commission recognizes there is a certain amount of uncertainty, and what some may consider scientific disagreement, involved in forecasting events based on climate change. Nevertheless, evidence in the Commission's record indicates that over the next several decades, future climate scenarios are likely to increase the frequency, size, and severity of fires in northern California. (*See e.g.* CDFW Status Review.) The Commission came to this determination based on the considerable amount of evidence on this matter while recognizing the uncertainty in forecasting climate predictions and that contrary evidence exists. Some examples of evidence contrary to the Commission's determination appear to be based on global studies, thereby lacking the finer resolution of studies focusing on northern California or areas that include the Sierra Nevada, or are presented in global figures whereby it is difficult to discern local geography to any specificity. (*See* e.g. Krawchuk et al. 2009 [Fig.3];[6] Gonzalez et al. 2010 [fig. 2c];[7] Liu et al. 2010 [Fig. 1].[8])

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[5] North, M. ed. 2012. Managing Sierra Nevada forests. Gen. Tech. Rep. PSW-GTR-237. U.S. Forest Serv., Pac. Southwest Res. Station, Albany, CA. 184pp.

[6] Krawchuk, M.A., M.A. Moritz, M. Parisien, J. Van Dorn, and K. Hayhoe. 2009. Global pyrogeography: the current and future distribution of wildfire. PloS ONE 4: e5102.

[7] Gonzalez, P., R.P. Neilson, J.M. Lenihan, and R.J. Drapek. 2010. Global patterns in the vulnerability of ecosystems to vegetation shifts due to climate change. Global Change and Biogeography 19:755-768.

[8] Liu, Y., J. Stanturf, and S. Goodrick. 2010. Trends in global wildfire potential in a changing climate. Forest Ecology and Management 259:685-697.

An example of competing climate evidence concerns the effect of increased summer precipitation on forest fires. Some evidence indicates that the increased summer precipitation could suppress fires or perhaps reduce the severity of fires. (*See e.g.* Petitioners' Status Review.) Contrary evidence questions the extent to which the Sierra Nevada would experience an increase in precipitation to have such an effect. (*See* California Department of Forestry and Fire Protection letter dated, June 4, 2012; USFS letter dated, May 31, 2012.) That same contrary evidence also questions the extent to which such increase could affect fire behavior beyond a few hours or days after rainfall; in other words, whether increased precipitation in the coming decades could appreciably affect California's Mediterranean climate of hot dry summers to change fires regimes in the Sierra Nevada. Other evidence indicates that predicted increases in summer precipitation will result in significantly increased fire activity in Sierra Nevada forests due to increased vegetation growth. (Lenihan et al 2008,[9] citing to Lenihan et al 2003; Westerling and Bryant 2008;[10] Miller et al. 2009.[11]).

The Commission is also presented with climate evidence that is subject to uncertainty. One example of climate evidence that involves uncertainty pertains to the potential change in vegetation due to climate change. A study predicted a change from conifer forest (commonly used by black-backed woodpeckers under current conditions) to mixed evergreen forest (used infrequently by black-backed woodpeckers under current conditions) in the Sierra Nevada by the end of the century. (Lenihan et al. (2008).) The study's authors however recognize the limitations in their modeling. Specifically, that there is considerable uncertainty concerning the impacts of climate change and that "the uncertainty due to differences among future climate scenarios and to unrepresented or poorly understood processes preclude the use of these simulations as unfailing predictions of the future. Nevertheless, the results of this and previous studies underscore the potentially large impacts of climate change on California ecosystems, and the need for further analyses of both future climate change and terrestrial ecosystem responses." (Lenihan et al. (2008).) The Commission carefully considered the fact that such vegetation change could potentially reduce the type of forest that currently hosts high densities of black-backed woodpecker, the uncertainties in the modeling, the time frame in which such vegetation change could occur, and the effect on the continued existence of the black-backed woodpecker in coming to its overall listing determination.

4. Unburned, Green Forest

In addition to considering the effects of fire suppression, fire treatment, and climate change on the creation of burned forest habitat as it pertains to the continued existence of the black-backed woodpecker, the Commission recognizes that evidence also indicates that black-backed woodpeckers do inhabit unburned, green forests. However, few recent studies have focused on the role of green forests as they pertain to the black-backed woodpecker's life history and continued existence. And although information in the record indicates that black-backed woodpeckers are at their highest density in burned forests, there is no information concerning the population within the Sierra Nevada indicating that the lower densities of black-backed

[9] Lenihan, J.M., D. Bachelet, R.P. Neilson and R. Drapek. 2008. Response of vegetation distribution, ecosystem productivity, and fire to climate change scenarios for California. Clim. Change 87: S215-S230.

[10] Westerling, A. L. and B.P. Bryant. 2008. Climate change and wildfire in California. Clim. Change 87: S231-S249.

[11] Miller, J.D., H.D. Safford, M. Crimmins, and A.E. Thode. 2009. Quantitative Evidence for Increasing Forest Fire Severity in the Sierra Nevada and Southern Cascade Mountains, California and Nevada, USA. Ecosystems12:16-32.

woodpeckers in green forests negatively affects the bird's continued existence (low density distinguished from small overall population is discussed below). A recent dissertation provided by the Petitioners seems to indicate that a population of black-backed woodpecker in beetle killed forests and forests burned by low-severity management fires declined over its four year study period. (Rota (2013)[12]) However, what is unanswered is if the declining population would reach a minimum but stable floor as the food source declines or if the population is expected to reduce to zero over time. It is also important to note that the study was located in the Black Hills, South Dakota. The forests in the Black Hills are different from that in the Sierra Nevada for several reasons including: tree species, tree size, tree spacing, disturbance regimes and other ecosystem processes, and in the associated insect and wildlife communities. These factors differentiate black-backed woodpeckers in California from those in the Black Hills and as a result it is unclear to what extent, if any, the study's determinations would apply to black-backed woodpeckers in California. Additionally, population trends commonly are subject to a high degree of variance over a short term, versus a robust population trend that is studied over decades.

B. Burned Forest Habitat Modification

Modification of burned forest habitat, primarily from post-fire salvage logging, can negatively affect nesting and foraging of black-backed woodpeckers, but there is no information directly linking the effects of such modifications to the black-backed woodpecker's continued existence in California. As mentioned above, black-backed woodpeckers occur in their highest densities in burned forests. Evidence clearly indicates that salvage/removal of burned trees i.e. snags, can result in reduced density of nesting and foraging as compared to similar burned forest stands that are not logged. However, there is no evidence in the record pertaining to the effect on the black-backed woodpecker's continued viability caused by such reductions in bird density. Also, it is worth noting that the mere fact that logging has occurred does not appear to reduce densities, rather it is the degree and intensity to which snags are logged that appears to affect post-fire densities of the bird. (*See e.g.* Forristal 2009.[13]) So, in light of the unclear role of green forest; the fact that some, if not most of the burned forest habitat on federal land remains after salvage logging; and the lack of evidence concerning a threat to the continued viability of the black-backed woodpecker caused by salvage logging; it is unclear what effect logging and its modification of habitat has on the continued existence of the black-backed woodpecker.

Even if the Commission assumed the existence of a correlation between modification of burned forest habitat and a negative effect on black-backed woodpecker's statewide population (there is no evidence in the record concerning such correlation), there is also a lack of evidence concerning the extent to which such burned forest modification must occur to affect the black-backed woodpecker's continued existence. Further complicating the analysis are the various ways in which one could assess the quantity of post-fire logging in federal forests (note: the Commission focused on federal forests because they comprise the vast majority of forestland that if burned could provide habitat for black-backed woodpeckers where they exist in high

[12] Rota, C.T. 2013. Not all forests are disturbed equally: population dynamics and resource selection of Black-backed Woodpeckers in the Black Hills, South Dakota. Ph.D. Dissertation, University of Missouri-Columbia, MO.

[13] Forristal, C.D. 2009. Influence of post-fire salvage logging on Black-Backed Woodpecker nest site selection and nest survival. MSc Thesis, Montana State Univ., Bozeman, MT. 78pp +apps.

densities (*See* CDFW Status Review).). For example, the Department cites in its status review that since 2003, 20% of severely burned conifer forest in the Sierra Nevada managed by USFS has been logged, and that 80% of severely burned forest has not been logged and therefore remained for black-backed woodpecker habitat. (CDFW Status Review.) Petitioners take issue with CDFW's use of the information by emphasizing it does not account for the variation in black-backed woodpecker habitat quality and that logging typically targets the highest quality black-backed woodpecker habitat. Evidence provided by Petitioners points out that logging of high quality black-backed woodpecker habitat occurs at rates higher than 20%. For example:

- Chip-munk Recovery and Restoration Project – within the project area USFS intends to log 42% of "the best Black-backed Woodpecker habitat (areas with 75-100% mortality in CWHR 5M and 5D [old-growth [i.e. medium/large tree] forest with moderate to high pre-fire canopy cover]) (1444 out of 3398 acres to be logged) and 38% of the next best (areas with 75-100% mortality in CWHR 4M and 4D [late successional [i.e. small tree forest with moderate to high pre-fire canopy cover]) (791 out of 2067 acres to be logged) – i.e., the areas most likely to be good nesting habitat (see Chip-Munk Environmental Assessment [EA], pp. 270-271) (see also Siegel et al. 2013)" (Petitioners' letter dated, June 11, 2013)

- Poker Chip Project – within the project area USFS "intends to log 42% of the moderate severity dense/mature-old [i.e. large tree forest (331 out of 737 acres to be logged) and 51% of the high-severity dense/mature-old [i.e. large tree] forest (166 out of 328 acres to be logged) (Poker Chip EA, pp. 64, 66)." (Ibid.)

- Reading Project – within the project area USFS "intends to log 56% of the good Black-backed Woodpecker habitat on USFS lands (2,536 out of 4,543 acres to be logged on NF lands) (Reading EA, p. 77)." (Ibid.)

- Angora Fire Restoration Project– within the project area USFS proposed to "salvage log 62% of all Black-backed woodpecker suitable habitat in the entire Angora fire area, and 70% of all high-quality habitat in the fire area." (Petitioners' Status Review)

- Moonlight and Wheeler Fires Recovery and Restoration Project – within the analysis area, "of the 32,569 acres characterized by the Plumas National Forest as suitable Black-backed woodpecker habitat on public lands within the Moonlight/Wheeler fire area, approximately 20,000 acres (about 61%) have been salvage logged, or are in the process of being salvage logged, on public lands." (Petitioners' Status Review.)

The Commission recognizes that the relative percentage of logged forest varies depending on different factors such as: whether one considers all projects in response to a fire or just individual projects, whether one considers the total burned area or just the project's area, whether one should consider previously burned forest in quantifying habitat, and when logging would occur relative to the fire. For example, the logging percentages in the USFS environmental assessments for the Chip-munk Recovery and Restoration Project (42% of the best black-backed woodpecker habitat) and the Poker Chip Project (60% of the high severity burn in CWHR 5M and 5D; 25 of 42 acres) represent the percentage of logging in that particular project in a particular burned area subject to environmental analysis. However, both projects are in response to the 2012 Chips fire. The Chips fire created a total of 4,133 acres of what Petitioners have

labeled as the best black-backed woodpecker habitat. (Chip-munk Recovery and Restoration Project Environmental Assessment, (April 2013).) The combined logging of both projects in that habitat is 1,468 acres (1,443 acres from Chip-Munk Project and 25 acres from Poker Chip project), so post-fire logging may affect approximately 36% (as opposed to 42% or 60%) of the best black-backed woodpecker habitat created by the Chips fire on federal land.[14] (Chip-munk Recovery and Restoration Project Environmental Assessment, (April 2013); Poker Chip Project Environmental Assessment, (March 2013).)

Similarly, the Reading Project is in response to the Reading fire which burned both the Lassen Volcanic National Park (16,993 acres) and the Lassen National Forest (11,071 acres), two forested areas that share an administrative border. (Reading Project, Environmental Assessment (April 2013).) The environmental assessment contemplates logging only in the Lassen National Forest; none in Lassen Volcanic National Park. Such logging would remove 56% of the burned forest habitat in the Lassen National Forest (2,535.28 out of 4,543.05 acres). However, if one considers logging's effect on total burned forest habitat created by the Reading fire i.e. burned forest habitat in both the Lassen National Forest *and* Lassen Volcanic National park (total of 14,203.91 acres), 18% (as opposed to 56%) of the burned forest habitat created by the Reading fire on federal land would be logged. (Reading Project, Environmental Assessment (April 2013).)

Another example of different factors affecting the percentage of habitat logged involves quantifying total burned forest habitat for the Angora Fire Restoration Project. The 2010 Angora Fire Restoration Project would log 62% of the suitable black-backed woodpecker habitat created by the Angora fire. (Angora Fire Restoration Project, Environmental Assessment (July 2010).) However, one could also consider that since 2001, within the cumulative area of the project's environmental analysis, two other fires created an additional 301 acres of suitable black-backed woodpecker habitat that wasn't logged. Combining all habitat created by the three fires, logging under the Angora Fire Restoration Project would affect 53% (as opposed to 62%) of such habitat (i.e. 1,858 acres (available from Angora fire) + 301 acres (available from two other fires) =2,159; the Angora Fire Restoration Project would log 1,149 of the total 2,159). (*See also* USFS letter dated, May 31, 2012.)

Yet another example of different factors affecting the relative percentage of habitat logged involves identifying the logging that should be used to calculate loss of habitat for the Moonlight and Wheeler Fires Recovery and Restoration Project ("Moonlight Wheeler Project"). In Petitioners' status review they assert that approximately 20,000 of the 32,569 acres of suitable black-backed woodpecker habitat would be logged i.e. 61%. The 20,000 acres appears to be the sum of 12,397 acres (the project), 7,525 acres (two other roadside hazard tree logging projects), and 500 acres (two other salvage logging projects). However, the Commission interprets the 12,397 acres as already including the two other roadside hazard tree logging projects and two other salvage logging projects such that the cumulative total of logging in suitable black-backed woodpecker habitat is 12,397 acres (Moonlight Wheeler Project, Environmental Assessment, p. 128.) Under this understanding of the Moonlight Wheeler Project environmental assessment's language, approximately 38% (as compared to 61%) of the suitable black-backed woodpecker

[14] The Poker Chip Project environmental assessment uses the terms: unburned/very low, low, moderate, and high for categorizing burn severity. In contrast, the Chip-munk Project environmental assessment uses basal area mortality percentages: 0-25%, 25-50%, 50-75%, and 75-100%. For purposes of illustrating logging's effect on the highest quality burned habitat created by the Chips Fire, the Commission equated high severity burning with 75-100% basal area mortality.

habitat within the Moonlight Wheeler project area would be salvage logged. (*See also* USFS letter dated, May 31, 2012.)

Another example involving the Moonlight Wheeler Project is the timing of logging post fire and its effect on burned forest habitat. Evidence in the record states that peak densities of black-backed woodpecker in burned forest habitat appear two to three years post fire, and that densities decline dramatically five years post fire. The Moonlight and Antelope Complex fires occurred in 2007. (Moonlight Wheeler Project, Environmental Assessment.) Petitioners' Status Review indicates that logging of black-backed woodpecker suitable habitat began in 2009, two years post fires. As of May 2012, approximately 7,988 acres of burned forest were logged. (USFS letter dated, May 31, 2012.) And as of February of this year logging was continuing, six years post fires. (Petitioners' Status Review.) So some percentage of the 12,397 acres of burned forest habitat that is to be logged persisted since 2009 and could be used by black-backed woodpeckers. Moreover, now that it is three to four years past the time period for peak densities of black-backed woodpeckers, the bird's density may be naturally declining in the Moonlight Wheeler Project area. Because the Commission received no data concerning the annual quantity of logging for the Moonlight Wheeler Project since 2009, one cannot assess the actual impact of the project's logging on burned forest habitat that would be occupied by black-backed woodpeckers; nor can one extrapolate such logging's effect on the black-backed woodpecker.

Other factors that can influence the role of salvage logging on burned forest habitat include: consideration of different quality of pre-fire habitat, consideration of different fire severities, consideration of the substantial area of federal forest land in which logging is administratively precluded (e.g. wilderness areas, roadless areas, and National Park land), and the public's participation and input to any federal environmental review of logging projects on federal land. Accordingly, based on the information before it, the Commission cannot conclude that post-fire salvage logging of burned forest habitat on federal land, by itself or in combination with other threats, has caused the black-backed woodpecker's continued existence to be in serious danger or threatened such that listing is warranted.

C. Population size

The Commission also received considerable information on the black-backed woodpecker's population size and related issues. The black-backed woodpecker's population is likely to be small. Population estimates range from 722-6,300 individuals. Furthermore, there is no objective, quantifiable evidence as to whether the black-backed woodpecker's population is increasing, decreasing, or is stable. Subjective statements in the record concerning the historical or more modern presence of black-backed woodpeckers (e.g. rather common, rare, etc.) lack any objective, contextual information to infer any reliable estimates of population size. It is important to understand that although black-backed woodpeckers appear at their highest densities in certain types of burned forest habitat due to habitat preferences, high densities of birds is different from the total population size i.e. quantity within a particular area versus total quantity in California. Nevertheless, the lack of objective, quantifiable data concerning population size and population trend is unsurprising given the fluctuating presence and apparent response of black-backed woodpeckers depending on environmental conditions. The black-backed woodpecker's range has remained the same despite the small population and ephemeral nature of burned forest habitat.

Although the population of black-backed woodpeckers is small and subject to risks attributed to small populations of species, there is no specific evidence in the record indicating the mere fact of the black-backed woodpecker's small population size, by itself or in combination with other factors, causes the bird's continued existence to be in serious danger or threatened. The record contains evidence both in support and against relying solely on population size as a predictor of a species' viability i.e. minimum viable population. (*See* e.g. CDFW's Status Review; Petitioners' Status Review; Traill et al. 2007;[15] Traill et al. 2010;[16] Flather et al. 2011.[17]) There is no way to simply assess the black-backed woodpecker's population viability against published information such as Traill et. al. 2007 who identified a single minimum viable population for all species of birds in the world based on only 48 species of birds. With the lack of scientific information about a population trend, the scientific information that documents a lack or range contraction and the known fluctuations in density caused by environmental conditions, the Commission determines that the black-backed woodpecker's small population size by itself does not indicate listing is warranted.

The potential risk posed by a small population might arise if the California population of black-backed woodpeckers were genetically isolated from the Oregon population. However, the limited genetic information in the record concerning the 20 sampled black-backed woodpeckers from the northern Sierra Nevada is inconclusive as to the question of genetic isolation. (*See* Petitioners' March 27, 2013 letter, citing Siegel et al. 2013.) The value of the genetic testing is limited by the fact that it involves only 20 birds and that all samples were from three areas in the northern Sierra Nevada mountain range. Differences between the samples presented in Siegel et al. 2013, Appendix 2 could be attributed to the geographic distances between samples. The most northerly samples were most similar to the Oregon population. Consequently, it is possible these reported differences reflect the fact that as one moves further south from Oregon, the genetic material becomes more different. A sample from the southern Sierra Nevada could be quite different from the California birds sampled in the northern Sierra Nevada and reflective of the transition in genetic material as one moves north to south. Nevertheless, Siegel et al. 2013 does not explain the reason for the differences. Thus, this first glimpse at the species genetic information is informative, but not conclusive. Even if the genetic information indicated the California population was genetically isolated, the extent of such fact on the black-backed woodpecker's continued viability would be unclear. However, given what appears to be contiguous conifer habitat from Oregon to California as indicated by maps in the record, one could infer the transfer of genetic material between the Oregon and California black-backed woodpecker populations. Accordingly, based on the information before it, the Commission cannot conclude that the California population of black-backed woodpecker's small size, either by itself or in combination with other threats, has caused the black-backed woodpecker's continued existence to be in serious danger or threatened such that listing is warranted.

[15] Traill, L. W., C. J. A. Bradshaw, and B.W. Brook. 2007. Minimum viable population size: A meta-analysis of thirty years of published estimates. Biol. Conserv. 139:159-166.
[16] Traill, L. W., B. N. Brook, R. R. Frankham, and C.J. A, Bradshaw. 2010. Pragmatic population viability targets in a rapidly changing world. Biol. Conserv. 143:28-34.
[17] Flather, C. H., G. D. Hayward, S.R. Beissinger, and P.A. Stephens. 2011. Minimum viable populations: is there a 'magic number' for conservation practitioners? Trends in Ecol. Evol. June 2011, vol. 26 (6).