

**Tiemann, Sheri@FGC**

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**From:** Mastrup, Sonke@FGC  
**Sent:** Thursday, April 03, 2014 9:47 PM  
**To:** FGC  
**Subject:** Fwd: Email 2 - Materials from CBD for Commissioners - Apr 16 Gray Wolf Listing Decision  
**Attachments:** CBD comments - May 6 2013 - CESA gray wolf status review.pdf; ATT00001.htm; 2013-5-6\_SCB\_Comments\_on\_Listing\_Gray\_Wolf\_in\_California\_under\_the\_CESA.pdf; ATT00002.htm; 1Carroll wolf peer review correspond.pdf; ATT00003.htm; Dr. Robert Wayne wolf peer review & correspond - highlighted comments re historical gray wolf subspecies in CA.pdf; ATT00004.htm; CDFW Gray Wolf OR7 Update - April 2014.pdf; ATT00005.htm

Another part for wolf

Sent from my iPhone

Begin forwarded message:

**From:** "Amaroq Weiss" <[aweiss@biologicaldiversity.org](mailto:aweiss@biologicaldiversity.org)>  
**To:** "Mastrup, Sonke@FGC" <[Sonke.Mastrup@fgc.ca.gov](mailto:Sonke.Mastrup@fgc.ca.gov)>  
**Subject:** Email 2 - Materials from CBD for Commissioners - Apr 16 Gray Wolf Listing Decision

Sonke:

This is the second in a sequence of emails to provide the Commission with materials in advance of the April 16<sup>th</sup> gray wolf CESA listing decision.

Attached are the following 5 separate documents:

1. A comment letter submitted by CBD to the Commission on May 6, 2013
2. A comment letter submitted by the Society for Conservation Biology to the Commission on May 5, 2013
3. Peer review comments from Dr. Carlos Carroll, provided to CDFW following his peer review of the Department's gray wolf 12-month status review report.
4. Peer review comments from Dr. Robert Wayne, provided to CDFW following his peer review of the Department's gray wolf 12-month status review report.
5. Documentation by CDFW of OR-7's presence in California in 2014.

A 3<sup>rd</sup> (and final) email with attachments will be sent to you next.

Regards,  
Amaroq

Amaroq Weiss  
West Coast Wolf Organizer  
Center for Biological Diversity  
707-779-9613



May 6, 2013

California Department of Fish and Wildlife  
1812 Ninth Street  
Sacramento, CA 95811  
Attn: Gray Wolf Status Report

**Re: Comments of the Center for Biological Diversity on the Listing of the Gray Wolf under the California Endangered Species Act**

The Center for Biological Diversity (“Center”) submits the following comments to the California Department of Fish and Wildlife’s (“Department”) for inclusion in its review process of the gray wolf, *Canis lupus*, as a candidate for listing and protection as endangered or threatened under the California Endangered Species Act (CESA), Fish and Game Code section 2050 et seq.<sup>1</sup>

We also note that we fully support and agree with the detailed comments that have been submitted to the Department by the Society for Conservation Biology (SCB).

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<sup>1</sup> The Center for Biological Diversity is a 501(c)(3) non-profit conservation organization that advocates for endangered species and which has more than 500,000 members and supporters nationwide, more than 70,000 of whom reside in California. The Center is one of four organizations which, on March 5, 2012, petitioned the California Fish and Game Commission (“Commission”) to list the gray wolf under CESA. In response to our petition, the Department prepared a report issued in August 2012 which recommended that listing may be warranted. After considering the Department’s report, written comments submitted by the public and testimony at a public hearing, on October 3, 2012, the Commission accepted our petition, designated the gray wolf as a candidate for listing and directed the Department to conduct a 12-month status review.

The gray wolf is a native species that was once broadly distributed across California, ranging from San Diego northward to the California-Oregon border, and from the coast eastward to California's borders with Nevada and Arizona. As elsewhere across the Lower 48, wolves in California were intentionally extirpated post-European contact. Wolves were mostly gone from California by the late 1800's, with the last known wolf killed in Lassen County in 1924. Across the United States, including in California, wolves were killed to accommodate a livestock industry that was not willing to coexist with them. Wolves are now returning to California as individual animals disperse from adjacent states and make their way into new territory. The information possessed by the Department, combined with information we provide here, and information provided in comments submitted by the Society for Conservation Biology establishes that listing the gray wolf under CESA is warranted. For wolves to successfully return to and reestablish ecologically-functioning populations in California, strong legal protections and management actions directed at recovery and conservation of the species are imperative.

For consideration in its status review, the Department has requested that comments or data be submitted regarding the following subjects: "the taxonomic status, ecology, biology, life history, management recommendations, distribution, abundance, threats, habitat that may be essential for the species in California, or other factors related to the status" of the gray wolf.<sup>2</sup> Our initial petition addressed all of these criteria. The following comments will focus, however, on the following subjects: the adequacy of existing laws and regulatory mechanisms to recover and conserve wolves in California; threats to wolves; habitat that may be essential for wolves in California; wolf population trends in states from which wolves may disperse to California; archeological evidence of historical wolf distribution, native species status, and history of cultural significance to California native people; and management recommendations for wolves in California. We address these issues now because we have new information we wish to submit that was not available at the time we submitted our petition.

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<sup>2</sup> California Department of Fish and Wildlife "Public Notice", dated February 8, 2013.

## **Listing The Gray Wolf Under CESA Will Provide The Necessary Legal Protections To Ensure The Species' Recovery And Conservation In California**

*Wolf recovery efforts in the Lower 48, to date, have depended upon wolves being granted protections under the Federal Endangered Species Act.*

A devastatingly-successful campaign to extirpate wolves in this country, beginning at least as early as the 1600's, was waged across the entire country well into the twentieth century. After this national policy of wolf eradication in the United States, the sole reason wolf recovery has occurred anywhere in the Lower 48 is due to legal protections that were eventually granted this species by the Federal Endangered Species Act (ESA).

It was only in 1968, when wolves received protection under a precursor to the ESA (later passed by Congress in 1973), that federal agencies started to plan for the restoration of wolves to their former habitat. After an additional two decades of political battles, gray wolves were finally reintroduced to the northern Rockies region in the mid-1990's, and the tiny remnant population of wolves residing in far northern Minnesota was allowed to expand in numbers and range across the Western Great Lakes region. An additional reintroduction program for gray wolves in the Southwestern U.S. saw its first wolf releases in the late 1990's.

Currently, the gray wolf is federally protected as endangered in much of the Lower 48 in habitat the species used to occupy -- including California.<sup>3</sup> Many of the states where federal protections for wolves currently exist contain habitat scientists have identified as suitable for the species. While there have been occasional confirmations over the years of lone wolves dispersing from the recovery areas of the northern Rockies and Western Great Lakes states into nearby states, many of these wolves have been killed by humans. None of these states yet have a resident gray wolf population nor any federal government wolf recovery plan in existence.<sup>4</sup>

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<sup>3</sup> Exceptions are the northern Rockies and Western Great Lakes recovery areas, from which federal protections were lifted in 2011 and 2012, respectively.

<sup>4</sup> The sole exceptions are Arizona and New Mexico, whose small population of reintroduced Mexican gray wolves is part of an entirely separate federal wolf recovery area.

*Federal protections for wolves in California will soon be removed.*

Since at least the year 2000, the U.S. Fish and Wildlife Service (“Service”) has made repeated attempts to reduce or remove federal protections for wolves in California, despite the fact that no confirmed wolves had yet dispersed to the state.<sup>5</sup> In May of 2011, the Service announced it would conduct a status review for gray wolves in the Lower 48, including the Pacific West region.<sup>6</sup> The widely-anticipated results of that status review were made known two weeks ago when, on April 25th, a leaked copy of the Service’s Proposed Rule was reported by the LA Times.<sup>7</sup> The Service’s proposal, which reportedly will be published in the Federal Register sometime in May, seeks to remove all federal protections for gray wolves in most of the Lower 48, with the exception of the Mexican gray wolf, which it would list as an endangered subspecies.<sup>8</sup>

If enacted, the Rule will remove all federal protections for wolves in California, as well as in the nearby states of Oregon and Washington. Wolf populations are just starting to reestablish in these two neighboring west coast states and are the most likely source of wolves that will disperse to California.

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<sup>5</sup> USFWS (U.S. Fish and Wildlife Service). 2000. Proposal to reclassify and remove the gray wolf from the list of endangered and threatened wildlife in portions of the coterminous United States. Federal Register 65(135): 43449-43496; Also, in 2002, the Service denied a petition that had been filed the year prior, by Defenders of Wildlife, to create a Distinct Population Segment (“DPS”) for gray wolves in the Pacific West, in an area representing over 16 million acres of federally-managed lands in southwestern Oregon and northern California. (U.S. Fish and Wildlife Service letter, 2002.)

<sup>6</sup> USFW (U.S. Fish and Wildlife Service). 2011, May 5. Gray wolf – Proposed Rule to Revise the List of Endangered and Threatened Wildlife for the Gray Wolf (*Canis lupus*) in the Eastern United States, Initiation o Status Reviews for the Gray Wolf and for the Eastern Wolf (*Canis lycaon*); Proposed Rule. 50 CFR Part 17, Federal Register, Vol 76, No. 87, p. 26086.

<sup>7</sup> Los Angeles Times, April 25, 2013. “U.S. plans to drop gray wolves from endangered list.” Julie Cart. <http://articles.latimes.com/2013/apr/25/local/la-me-wolves-20130426>

<sup>8</sup> Draft - U.S. Department of the Interior, Fish and Wildlife Service, 50 CFR Part 17 [Docket No. XXXXX] [FXES11130900000C2-123-FF09E32000] RIN 1018–AY00 Endangered and Threatened Wildlife and Plants; Proposed Rule To Remove the Gray Wolf (*Canis lupus*) from the List of Threatened and Endangered Wildlife and Maintain Protections for the Mexican Wolf (*Canis lupus baileyi*) by Listing it as Endangered. 2013.

Most likely, the federal Rule to remove protections for gray wolves here and across most of the Lower 48 will become law. While years of attempts by the Service to remove protections for wolves in the northern Rockies resulted in protracted legal challenges, ultimately Congress stepped in and delisted wolves in that region from the ESA through a rider attached to a federal appropriations bill. A Rule that removes federal protections for wolves in most of the Lower 48 will similarly be subject to lawsuits. There are current efforts in Congress, once again, to step in to undermine the ESA and protections for wolves. Given the direction of federal agencies and Congress to remove protections for wolves in the Lower 48, it is advisable for the agencies and all parties in California to assume that a complete delisting will be the eventual outcome at the federal level.

*Absent federal or state listing, legal protections for wolves in California are inadequate to protect, recover and conserve the species.*

In October of 2012, the Commission accepted our listing petition and designated the gray wolf species as a candidate for listing in California. While this status grants full protections for gray wolves, as if listed under CESA, the protections are only conferred temporarily until a final listing decision is made. (Fish & Game Code § 2074.2 (a)(2) and § 2075.5.)

Absent federal protections for wolves and listing under CESA, any gray wolves entering California would qualify for designation only as “nongame mammals” under Fish & Game Code § 4150. This designation will allow the unlimited killing of wolves for almost any reason or excuse. Under Fish & Game Code §§ 2000, 4150 and 4152, wolves can be killed if they cause any damage to property. This designation provides no protections for wolves and is subject to unlimited abuse. For example, a rancher might subjectively decide that having wolves in the neighborhood devalues property values and that he or she is justified in killing every wolf in the county.

The statutes that would govern the designation of the wolf and that define the scope of when wolves can be killed are the following statutes:

- Section 2000 provides a general prohibition on take as defined by State law of any bird, mammal, fish, reptile or amphibian, except as provided by other provisions of the Fish & Game Code or state law or regulation.
- Section 4150 designates nongame mammals as being “[a]ll mammals occurring naturally in California which are not game mammals, fully protected mammals, or fur-bearing mammals . . . .Nongame mammals or parts thereof may not be taken or possessed except as provided in this code or in accordance with regulations adopted by the commission.”
- Section 4152 provides that “(a) Except as provided in Section 4005, nongame mammals . . . that are found to be injuring growing crops or other property may be taken at any time or in any manner in accordance with this code and regulations adopted pursuant to this code by the owner or tenant of the premises or employees and agents in immediate possession of written permission from the owner or tenant thereof. They may also be taken by officers or employees of the Department of Food and Agriculture or by federal, county, or city officers or employees when acting in their official capacities . . . .”

In the northern Rockies, humans are the largest cause of wolf mortality and the only cause that can significantly affect populations at recovery levels. (USFWS 2000; Mitchell et al. 2008; Murray et al. 2010, Smith et al. 2010.)<sup>9</sup> While wolves were federally listed in the northern Rockies, the chief cause of wolf deaths occurred when agencies killed them in response to wolf-livestock conflicts. Other significant causes of wolf deaths include illegal poaching, vehicle collisions and inter-pack strife. (Smith et al., *supra*, 2010.) In California, absent federal or state

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<sup>9</sup> USFWS (U.S. Fish and Wildlife Service). 2000. Proposal to reclassify and remove the gray wolf from the list of endangered and threatened wildlife in portions of the coterminous United States. Federal Register 65(135): 43449-43496; Mitchell, M.S., D.E. Ausband, C.A. Sime, E.E. Bangs, J.A. Gude, M.D. Jimenez, C.M. Mack, T.J. Meier, M.S. Nadeau, and D.W. Smith. 2008. Estimation of successful breeding pairs for wolves in the northern Rocky Mountains, USA. *Journal of Wildlife Management* 72:881-891; Murray, D.L., D.W. Smith, E.E. Bangs, C. Mack, J.K. Oakleaf, J. Fontaine, D. Boyd, M. Jimenez, C. Niemeyer, T.J. Meier, D. Stahler, J. Holyan, and V.J. Asher. 2010. Death from anthropogenic causes is partially compensatory in recovering wolf populations. *Biological Conservation* 143:2514-2524; Smith, D.W. Smith, E.E. Bangs, J.K. Oakleaf, C. Mack, J. Fontaine, D. Boyd, M. Jimenez, D.H. Pletscher, C. C. Niemeyer, T.J. Meier, D. R. Stahler, J. Holyan, V.J. Asher and D.L. Murray. 2010. Survival of colonizing wolves in the northern Rocky Mountains of the United States, 1982-2004. *Journal of Wildlife Management* 74:620-634.

listing, the self-help provisions of Fish & Game Code § 4152 would result in an inordinate amount of take of wolves by property owners applying their own definition of what constitutes “injuring . . . property.”

*Because of its conservation mandate, CESA listing will provide the legal protections essential to achieve wolf recovery in the State.*

Based on the inadequacy of protections for wolves pursuant to these general State wildlife statutes, and the impending and near-certain removal of federal protections for wolves in California, listing the gray wolf under CESA is imperative to recover and conserve the species here. It would also be in keeping with California’s strong legacy of protecting endangered and rare species that are part of the State’s natural history and cultural heritage.

In fulfilling its duties pursuant to CESA, the Department should err on behalf of wildlife and conservation. Listing of species should not be seen as a burden to people or property; rather, as CESA itself states, conservation of wildlife is fundamental to our well being: “these species of fish, wildlife, and plants are of ecological, educational, historical, recreational, esthetic, economic, and scientific value to the people of [California], and the conservation, protection, and enhancement of these species and their habitat is of statewide concern.” Fish and Game Code, § 2051.

The purpose of the California Endangered Species Act (“CESA”) is “to conserve, protect, restore, and enhance any endangered species or any threatened species and its habitat.” Fish and Game Code, § 2052.<sup>10</sup> CESA and its implementing regulations mandate that a species “shall be

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<sup>10</sup> CESA defines an “endangered species” as “a native species or subspecies of 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, overexploitation, predation, competition, or disease.” CFGC § 2062. A “threatened species” is “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 . . . .” CFGC § 2067.

listed if its continued existence is in serious danger or is threatened by . . . present or threatened modification or destruction of its habitat, overexploitation, predation, competition, disease, or other natural occurrences or human-related activities.” 14 CCR § 670.1.

CESA ensures the overall conservation of listed species. State agencies have a duty to not approve projects that would result in the “destruction or adverse modification of habitat essential to the continued existence of [any endangered or threatened species] if there are reasonable and prudent alternatives available consistent with conserving the species or its habitat which would prevent jeopardy.” (Fish and Game Code, § 2053.) Section 2053 further states that “it is the policy of this state and the intent of the Legislature that reasonable and prudent alternatives shall be developed by the department, together with the project proponent and the state lead agency, consistent with conserving the species, while at the same time maintaining the project purpose to the greatest extent possible.” Section 2055 also declares that “all state agencies . . . shall seek to conserve endangered species . . .” (Fish and Game Code, § 2055.) “Conserve . . . means to use, and the use of, all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this chapter are no longer necessary. (Fish and Game Code, § 2061.)

Both the legislature and the courts have made clear that California “has been at the forefront of enacting legislation to protect endangered and rare animals . . . . [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 Assn. v. California Fish & Game Comm.*, 156 Cal. App. 4th 1535, 1540, 1546 (Cal. App. 3d Dist. 2007). The State should remain at the forefront when it comes to protecting an apex predator whose presence was, for thousands of years, part of the fabric of California’s natural history, and whose recovery will restore ecological processes that have been missing from its landscape due to this species’ absence.

We are concerned that, in its evaluation of the listing petition, the Department has characterized the petition’s contents as not having scientific certainty. CESA, however, should be interpreted as requiring the best scientific information available as opposed to requiring scientific certainty.

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CESA was modeled on the federal ESA, and the two statutes contain very similar substantive and procedural provisions. California Courts have explained that “it is a basic premise of statutory construction that when a state law is patterned after a federal law, the two are construed together.” *NRDC v. California Fish & Game Comm.*, 28 Cal. App. 4th 1102, 1118 (1994), citing *Moreland v. Department of Corporations*, 194 Cal. App. 3d 506, 512-13 (1987).

Federal courts interpreting the federal ESA have repeatedly stressed the fact that agency decisions are to be based upon best available scientific information. For instance, a federal district court has stated the following:

The [ESA] contains no requirement that the evidence be conclusive in order for a species to be listed. Application of such a stringent standard violates the plain terms of the statute . . . Congress repeatedly explained that it intended to require the FWS to take preventive measures before a species is ‘conclusively’ headed for extinction. The purpose of creating a separate designation for species which are ‘threatened’, in addition to species which are ‘endangered’, was to try to ‘regulate these animals before the danger becomes imminent while long-range action is begun.’

The FWS itself has taken the position that it need not, and must not, wait for conclusive evidence in order to list a species. For example, in its decision to list the northern spotted owl, it explained that because the agency had ‘used the best data available to prepare the proposed rule’, it was ‘not obligated to have data on all aspects of a species’ biology prior to reaching a determination on listing’. Moreover, the agency concluded that ‘to withdraw the proposal and conduct additional research would not improve the status of the [species] and would not be in keeping with the mandates of the Endangered Species Act.’ More recently, the FWS decided to list the California red-legged frog, even though many aspects of the species’ status were ‘not completely understood’, because ‘a significant delay in listing a species due to large, long-term biological or ecological research efforts could compromise the survival of the [species].’

The ESA does not . . . require . . . ‘certainty’ to justify the listing of a species. To the contrary, the clear intent and purpose of Congress in enacting the ESA was to provide preventive protection for species before there is ‘conclusive’ evidence that they have become extinct.

*Defenders of Wildlife v. Babbitt*, 958 F.Supp. 670, 679-81 (D.D.C. 1997) (internal citations omitted).

Thus, while the Department’s recommendation of whether to list the wolf must be based on the “best available science” nowhere does CESA indicate that for the listing threshold to be met there must be “scientific certainty.” The information we submitted concerning range, distribution, abundance, habitat that is essential for the species’ continued existence and threats faced by the species is the best available scientific evidence and is substantial. It is worthy of being the basis for the Department’s decision and it is sufficient to meet the threshold for listing. Given the current situation of wolves in California, waiting for “certainty” would imperil the species here further, and would violate CESA’s purpose and intent.

*Developing a State wolf plan is not a replacement for listing the species under CESA*

While the State is considering whether to list the gray wolf under CESA, the Department is simultaneously coordinating a stakeholder process to draft a state wolf conservation and management plan. These are two separate processes, each with its own unique purposes and goals. The development of a state plan with conservation-oriented goals and recommended actions, alone, is not a sufficient surrogate for listing under CESA. The listing of the gray wolf under CESA is the best vehicle to ensure successful recovery of the species. Information learned during that procedure can be incorporated into a state wolf plan.

## **THREATS TO GRAY WOLVES IN CALIFORNIA WARRANT LISTING THE SPECIES UNDER CESA**

Listing of the gray wolf as an endangered species under CESA is warranted because of direct and indirect threats to the continued existence of this species. Threats to the survival of wolves are most dire during the period in which they begin dispersing into new territory and during the time that their numbers remain low, such as the movement of wolves now into California. When wolves exist in healthy, stable packs, the same threats do not carry the equivalent potential for total devastation. Now is the time and the phase of wolf recovery in California when the wolf needs protections the most.

The Department prepared a report in response to our listing petition. Among its many conclusions, the report asserted that “factors affecting the ability of wolf populations to survive and reproduce in California cannot be accurately projected or scientifically confirmed at this time.” (“Department Listing Petition Report” at pp. 22-23.)<sup>11</sup> The Report further concluded that “. . . the Department is not aware of any evidence indicating that the single wolf traveling through a number of counties in California, OR7, has experienced any direct threats by humans” and that “[u]ntil other wolves occur in California and related studies are conducted, . . . there is no scientific certainty at this time with respect to the nature and extent that humans will pose a threat to wolves in California.” (*Id.* at p. 24.)

In response, the Center contends that there is substantial and incontrovertible evidence of the nature and extent that humans will pose serious threats to wolves in California, although evidence may not quite reach the level of scientific “certainty” which, as noted before, is not a necessary or wise threshold. When the report was issued in August 2012, verifiable factual evidence of threats to wolves in California had already begun to appear and have continued to materialize.

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<sup>11</sup> State of California Natural Resources Agency Department of Fish and Game “Report to the Fish and Game Commission: Evaluation of the Petition from the Center for Biological Diversity, Big Wildlife, The Environmental Protection Information Center, and the Klamath-Siskiyou Wildlands Center to List Gray Wolf (*Canis lupus*) as an Endangered Species under the California Endangered Species Act. August 1, 2012.”

*Threats exist of potential predation by humans on wolves in California.*

With the exception of wolves living in core-protected areas such as National Parks where they are not subject to human exploitation, the leading cause of death for wolves is some form of action by human beings. In one study which covered the period from 1982-2004, in the northern Rockies, 80% of wolf-mortalities were from human causes including agency lethal control actions, poaching and vehicle collisions. (Smith et al. 2010, *supra*). In Washington, where wolves are just starting to return, only two years after the Lookout Pack was confirmed in 2008 as that State's first breeding pair with pups in nearly 70 years, a family from Twisp poached nearly the entire pack.<sup>12</sup> As lone, dispersing Idaho wolves began to make their way into Oregon, four of the first five were found dead, two of them illegally shot and one struck by a vehicle. (Oregon Wolf Conservation and Management Plan at p. 1.)<sup>13</sup>

In the United States, whenever and wherever wolves have traveled into rural territories where livestock and agriculture interests predominate, the wolf has been met by illegal and violent poaching; by politicians boasting they were willing to defy the law and kill wolves on sight; by angry, organized protestors, and by widespread overt expression by community members of a desire and a willingness to kill wolves. Post-federal-delisting, the state-sanctioned hunting seasons in Idaho, Wyoming and Montana in 2011-2013 unleashed this desire for the kill, and the invitation to kill was met with enthusiasm.

As will be shown immediately below, the evidence is abundant and irrefutable that the wolf will be subjected to the same threats in the same degree when it travels into many of the rural areas of Northern California. One can examine the history and facts from the northern Rockies and compare those facts to recent events in many communities in Northern California, and the conclusion is inescapable. Based upon those facts and comparisons, one can say with a high

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<sup>12</sup> Wolf poachers get more than slap on wrist. <http://blog.seattlepi.com/seattlepolitics/2012/07/11/wolf-poachers-get-more-than-slap-on-wrist/>

<sup>13</sup> Oregon Wolf Conservation and Management Plan. Oregon Department of Fish and Wildlife. December 2005 and updated 2010.

predictive confidence that the wolf in California will face the same threats it has encountered in every state it has wandered into.

### *Indirect threats*

Since late December of 2011 until the present, as OR-7 first approached and then crossed over the border into California, countless verbal and written threats have been made in California against wolves generally and against OR-7 specifically. Some of these threatening statements have been made by elected county officials from northern California counties where OR-7 was traveling. These statements have been documented in published newspaper articles, captured in archived audiotape recordings of public hearings, and heard first-hand by members of the public in attendance at the hearings. Examples include:

- “People are pretty much at their wits' end trying to make a living with all the environmental protections that are being foisted upon them,” she said. As for wolves, “we would like to see them shot on sight.” -- Statements made by the chair of the Siskiyou County Board of Supervisors, as reported in a December 24, 2011 Los Angeles Times article.<sup>14</sup>
- “If I see a wolf, it's dead.” -- Statement repeatedly made by a Modoc County Supervisor during a January 24, 2012 public board of supervisors meeting recorded in online archival audiotapes retained by the County.<sup>15</sup>
- “If I see an animal in my livestock, I kill it. If I kill a wolf, you going to throw me in jail? I don't care what it is.” -- Rhetorical query by a County supervisor to the Department's spokesperson during a February 21, 2012 public meeting of the Lassen County Board of Supervisors.<sup>16</sup>

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<sup>14</sup> Los Angeles Times, December 24, 2011. “A lone wolf heralds the return of a mythic predator.” Bettina Boxall. <http://articles.latimes.com/2011/dec/24/local/la-me-wolf-oregon-20111225>

<sup>15</sup> Modoc County Board of Supervisors January 24, 2012 hearing, audio-archives available at [www.co.modoc.ca.us/departments/board-of-supervisors/agenda-minutes-audio/](http://www.co.modoc.ca.us/departments/board-of-supervisors/agenda-minutes-audio/)

<sup>16</sup> Lassen County Board of Supervisors hearing, February 21, 2012. (from A. Weiss' notes taken at the hearing.)

From the time OR-7 arrived in California, threats against wolves and against OR-7 have also been made by California citizens in comments posted on the internet in response to online news stories.

Verbal threats by County officials were made under circumstances in which wolves were not actually present nor is there evidence that any of the individuals making the threats were capable of carrying them out. These statements are thus best characterized as indirect threats.

Nevertheless, it is disheartening -- and inappropriate -- for elected government representatives to proclaim that they would break the law and kill a species that is a federally-protected animal.

These statements conflict with the oaths the officials undoubtedly took to uphold the law, and these statements serve as encouragement for local residents who are opposed to wolves to feel as though they could take action against wolves with impunity.

#### Direct threats

In its report evaluating our listing petition, the Department offered the following conclusions regarding direct threats to wolves in California: “The Department has received some input from residents and local government representatives expressing concern about OR7 and possibility of other wolves in California generally, but no related incidents have prompted or otherwise required the Department to intervene. . . . Until other wolves occur in California and related studies are conducted, however, there is no scientific certainty at this time with respect to the nature and extent that humans will pose a threat to wolves in California.” (Petition Evaluation Report at p. 24) We disagree. There exist known, direct physical threats by humans to the safety of wolves entering California.

As the Department is aware, a privately-sponsored coyote contest-hunt took place across Modoc, Siskiyou, Shasta and Lassen counties this year, last year and during the five years prior. These counties encompass a substantial amount of the terrain where OR-7 was traveling and are the pathway through which any wolves dispersing from Oregon would enter into California. Despite great public outcry, the 2013 contest-hunt proceeded, 42 coyotes lost their lives to 90 two-man teams, and the Modoc County sheriff’s opinion piece published in the local newspaper one day

before the contest's start advised participants to violate federal lands hunting laws and to stand their ground if anyone challenged them.<sup>17</sup>

Much of the vocal opposition to the return of wolves to California has come from residents of the counties in the North State area. Op-ed articles like that of the sheriff's, letters to the editor in local newspapers, and statements made by public officials and private citizens regularly endorse taking actions that would violate federal or state laws regarding public lands, endangered species protections, or restrictions on hunting or trapping of wildlife. As an example, the coyote contest-hunt was advertised by its sponsors as spanning across private and public lands through the four-county region, despite legal prohibitions against – or the requirement to first obtain a special use permit for -- predator-hunting in various federally-managed lands, as well as in wildlife areas managed by the Department. Anti-government, anti-wildlife-and-environmental-protection attitudes exist, they will always exist, and they pose a serious threat to the recovery of wolves in the region.

The coyote contest-hunt has resulted in the Department intervening expressly to prevent harm to any endangered wolves that could be in the area, in both 2012 and 2013:

- Although conservation and animal-protection organizations were not aware in 2012 that coyote contest-hunts existed in California and that one took place annually in the North State region, the Department was aware of the 2012 coyote contest-hunt and was sufficiently concerned for OR-7's safety then that, on its own, it increased agency presence in the region during the weekend of the hunt.<sup>18</sup>

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<sup>17</sup> 42 coyotes reportedly killed in hunting contest. SFGate blog, peter Fimrite. March 4, 2013. <http://blog.sfgate.com/stew/author/pfimrite/page/2/>; In a letter to the editor of the Modoc County Recorder on Feb. 7, Modoc County Sheriff Mike Poindexter said he won't "tolerate any restriction of legal hunting on our public lands" despite federal laws prohibiting or regulating coyote hunting on federal lands in and near Modoc County. The sheriff also recommended that any hunt participant who is questioned or detained by federal enforcement officials for illegally hunting on federal lands to "cooperate but stand their ground and call the Sheriff's Office" and that sheriff deputies "absolutely will not tolerate any infringement upon your liberties pertaining to accessing or legally hunting on your public lands."

<sup>18</sup> "Fish & Wildlife officials say the hunt is legal and there's nothing they can do to stop it. They were more concerned last year when OR7 was in the same county as the hunt and sent wardens to educate

- After concerned citizens and organization representatives testified at a February 5<sup>th</sup>, 2013, Fish and Game Commission hearing to oppose the contest's reckless killing of coyotes and endangerment of wolves, the Department agreed to send agency staff to the contest to advise participants it is illegal to kill a wolf, how to distinguish wolves from coyotes, and to monitor the situation to prevent violations of law.<sup>19</sup>

Wolves and coyotes are commonly mistaken for one another. The Department is aware of this and has even included statements to this effect in reports it has published regarding wolves.<sup>20</sup> Lone wolves dispersing into states that have not had wolves present for decades have been mistaken for coyotes and shot by hunters.<sup>21</sup>

The coyote contest-hunt was widely-covered by California news outlets, and the Department was quoted extensively. In one media report, the Department's representative expressed puzzlement

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hunters." Groups trying to protect wolf oppose coyote hunt. San Jose Mercury News, Feb 1, 2013. [http://www.mercurynews.com/breaking-news/ci\\_22500263/groups-battle-over-coyote-hunt-wolf-territory](http://www.mercurynews.com/breaking-news/ci_22500263/groups-battle-over-coyote-hunt-wolf-territory)

<sup>19</sup> California Fish and Game Commission February 5, 2013 public meeting.

<sup>20</sup> "Wolves are often mistaken for coyotes . . ." (Gray Wolves in California Report at p. 11); "Wolves are often confused with coyotes (*Canis latrans*) . . ." (Department Listing Petition Report at p. 6).

<sup>21</sup> On January 29, 2013, the U.S. Fish and Wildlife Service confirmed that a large canine shot by a coyote hunter in Kansas was a wild wolf - the first instance of a wolf in Kansas in almost 75 years. See Corn, M. Jan. 29, 2013. "DNA Tests Confirm Animal Was a Wolf," The Hays Daily News. (accessed online on 1.29.13 at <http://www.hdnews.net/Story/wolfkilled012913>). See also, e.g., WolfPark.org/coyotes ("The coyote is often mistaken for the larger, bulkier wolf, especially when only glimpsed in fading light or behind foliage."); [www.arizonahuntingtoday.com](http://www.arizonahuntingtoday.com) ("A 70-pound female wolf was shot and killed Jan. 25 by a coyote hunter in Roberts County. Wolves are protected under the Endangered Species Act and state law, and it is illegal to kill them, according to U.S. Fish and Wildlife Service and state Game, Fish and Parks Department officials. People who plan to hunt coyotes in northeastern South Dakota, particularly in northern Roberts County, must make sure the animal is definitely a coyote and not a wolf."); Montana Fish, Wildlife & Parks ([fwp.mt.gov/search](http://fwp.mt.gov/search)) ("It is sometimes hard to tell the difference between wolves and coyotes, especially from a distance."); Michigan Wolf Management Plan (July 10, 2008) at 34 ("Other regulations could protect the wolf population in more-specific ways. For example, in recent years, the coyote season has been closed in the UP and the northern LP during the November 15–30 firearm season to help prevent the killing of wolves misidentified as coyotes. This restriction and other regulations will be reviewed, modified or enacted as necessary to provide the wolf population with appropriate levels of protection.") (available at: [http://www.michigan.gov/documents/dnr/Draft\\_Wolf\\_Management\\_Plan\\_030708\\_227742\\_7.pdf](http://www.michigan.gov/documents/dnr/Draft_Wolf_Management_Plan_030708_227742_7.pdf)).

that conservation groups and the public were not equally concerned for OR-7's safety while he was in Tehama County during deer-hunting season – a clear signal from the Department that it recognizes that wolves are placed at risk during big game hunting seasons, as well.<sup>22</sup>

While there are many responsible hunters, there are others who do not wait to properly identify their target before pulling the trigger or releasing their arrow. Yet others may knowingly violate the law if they find themselves faced with the opportunity to take a wolf and the poaching statistics previously cited in our comment letter support this concern. Because of the potential for either of these scenarios to exist, in which a hunter “steps over the line” and injures or kills a wolf, hunting season is always going to be a danger to wolves.

### **HABITAT THAT MAY BE ESSENTIAL FOR THE SPECIES IN CALIFORNIA HAS BEEN SCIENTIFICALLY-DETERMINED**

The Center's listing petition provided information based on published, peer-reviewed, scientific modeling studies that have identified habitat in California that is deemed potentially suitable for a population of wolves.<sup>23</sup> While wolves are habitat generalists and can live just about anywhere that humans will tolerate them, the species does best in areas where there is sufficient adequate prey and reduced potential for human-caused mortality. Since the potential for such mortality is correlated with human population density and road density, wolves fare better in locales where both humans and roads are present in low densities. The modeling studies we referenced identify potential suitable wolf habitat in California based on these parameters. Since the modeling

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<sup>22</sup> While we are not personally aware of reported incidents in which wolves have been shot after being mistaken as a deer, we are aware of an instance that was reported in Minnesota in the late 1990's-early 2000's in which a wolf may have mistaken a deer-hunter for a deer. In that incident, the hunter was in the woods and had spilled bottled deer urine on himself to mask his human scent. He reported to officials and the media that a wolf had come running at him, landed on his shoulder and then kept running. Speculation among wildlife officials at the time was that the wolf thought the man was a deer but on closer inspection discovered its mistake. (Personal recollection by A. Weiss of the reported incident.)

<sup>23</sup> Carroll, C. et al. 2001. Is the return of the wolf, wolverine and grizzly bear to Oregon and California biologically feasible? In D. Maehr, R. Noss and J. Larkins (eds.). Large mammal restoration: ecological and sociological implications. Island Press, Washington, D.C.; Carroll, C., et al. 2006. Defining Recovery Goals and Strategies for Endangered Species: the Wolf as a Case Study. *BioScience* 56:25-27.

results exclude other land areas, they necessarily indicate habitat which may be essential for wolves in California.

The Department insists the referenced studies by Carroll et al. require ground-truthing and “cannot be relied upon at this time to predict wolf habitat suitability or population density and trend in California with scientific certainty.” The threshold for listing a species under CESA does not require that the science considered in the evaluation process have “certainty”, only that the “best available science” be used.

In its comment letter to the Department, the Society for Conservation Biology (SCB) expresses deep concern that the Department’s response is to ignore or discount this peer-reviewed and scientifically-accepted modeling methodology and its research results. In its evaluation of gray wolf status in the Pacific West states, the U.S. Fish and Wildlife Service found the Carroll et al. studies’ results sufficiently robust to rely on them. It also found modeling studies by other researchers supported the Carroll et al. results.<sup>24</sup> (*See, also*, SCB gray wolf CESA listing comments, Figure 2.) The fact that the Service relied on those studies, we hope, will cause the Department to reconsider its conclusion about the Carroll et al. studies.

During the 15 months of his travel within California, as well as during the months he has spent in adjacent southwestern Oregon, OR-7 has done a considerable amount of ground-truthing of his own. As the map on the following page demonstrates, OR-7 has wandered, and slept, and hunted, and fed, and sustained himself entirely within the bounds of the habitat identified in the modeling studies. (Figure 1.)

Given that the maps generated by these modeling studies are based on criteria that best predict where wolves will be able to survive and maintain viable populations, we believe they are scientifically-credible and reliable indicators of habitat that may be essential for this species in California.

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<sup>24</sup> Oakleaf, J.K. et al. 2006. Habitat Selection by Recolonizing Wolves in the Northern Rocky Mountains of the United States, *Journal of Wildlife Management* 70(2):554-563; Larsen, T. and W.J. Ripple. 2006. Modeling gray wolf (*Canis lupus*) habitat in the Pacific Northwest, U.S.A. *Journal of Cons. Planning*, 2(1):30-61.

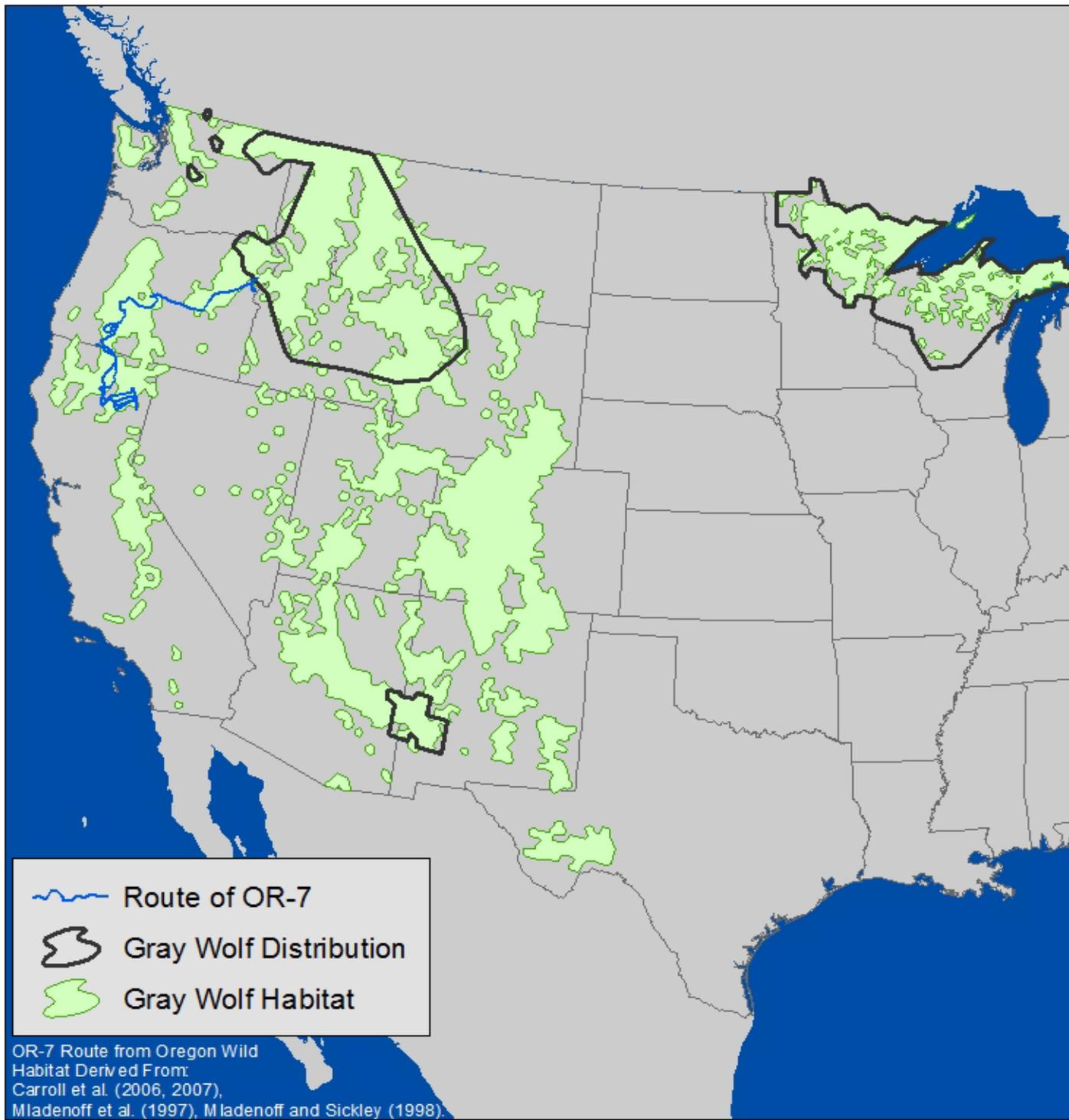


Figure 1. Map of suitable wolf habitat in California, with OR-7's travels digitized and overlaid. Map created by Curt Bradley / Center for Biological Diversity

**WOLF POPULATION TRENDS IN OREGON AND WASHINGTON SUPPORT THE LIKELIHOOD MORE WOLVES WILL DISPERSE TO CALIFORNIA IN THE FUTURE**

Our listing petition noted that California can anticipate the arrival of more dispersing wolves from Oregon, as the wolf population in Oregon increases. The Department, however, concluded that whether Oregon's wolf population would continue to increase could not be determined with "scientific certainty." (Listing Petition Evaluation Report, *supra*, at p.14.)

We reiterate that CESA does not require "scientific certainty" -- however, natural reproduction by Oregon's wolves over the past year has resulted in the addition of some data points. In the 12 months since our listing petition was filed, the Oregon wolf population nearly doubled, from 29 wolves in Feb 2012 to 47 wolves in March 2013. There are now six confirmed packs and six breeding pairs in Oregon. (ODFW website page on gray wolves, *supra*.)

The state of Washington is another potential source of wolves that could disperse to California. Its wolf population also has nearly doubled in the same 12-month period, from 27 confirmed wolves in February 2012, to a minimum of 51 wolves as of February 2013. (Washington Department of Fish and Wildlife February 15 2013 news release.)<sup>25</sup> Wolves from British Columbia have dispersed to Washington's North Cascades Ecosystem where three wolf packs have established. There are an additional seven packs in the northeastern part of the State, a pack whose territory straddles the border with British Columbia, and several probable but yet unconfirmed packs. The spine of the Cascade mountain range runs south through Oregon and deep into northern California and could provide a travel corridor for wolves to disperse from Washington to California.

In every state in which wolves have been re-introduced or into which they have dispersed, their numbers have dramatically increased so long as they were the beneficiaries of state or federal

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<sup>25</sup> <http://wdfw.wa.gov/news/feb1513a/>

protections.<sup>26</sup> Those states include Idaho, Wyoming, Montana, Oregon and Washington, as well as Wisconsin and Michigan. In these states, successful reproduction and dramatic population increases occurred 100% of the time. Oregon and Washington have wolf management plans. The wolf is protected as an endangered species under Oregon and Washington state law. Wolves in Oregon and Washington will increase in numbers. Some of those wolves will move to California. That is the nature of this apex predator.

The Department has on several occasions indicated it has not found credible evidence of other wolves in California. Neither staff biologists monitoring for other species nor automated trail cameras installed in northern California counties have discovered evidence of other wolves in the region. During the 15 months that OR-7 traveled in these same areas, his presence and whereabouts were known only due to the satellite information provided by his GPS radio-collar. OR-7 has never been photographed by any of the trail cameras, and has been confirmed to have been seen by humans on only three occasions – once by Department biologists and twice by private citizens. He has been so nearly-invisible that some refer to him as the “ghost wolf.” Given the doubling of the wolf populations of Oregon and Washington and the naturally-elusive behavior of the species, it is likely other wolves will in the future disperse to or may have already arrived in California.

### **ARCHEOLOGICAL FINDINGS PROVIDE EVIDENCE OF THE DISTRIBUTION, NATIVE STATUS AND HISTORICAL AND CULTURAL SIGNIFICANCE OF THE GRAY WOLF IN CALIFORNIA**

Archeological and anthropological evidence of the historic range and distribution of wolves in California, including some published research on the topic, is known to the Department and has been discussed in some of its wolf reports. We provide here additional relevant evidence for consideration in the Department’s gray wolf listing status review. The following scientific evidence confirms the presence of wolves in California as far back as 4300 years ago.

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<sup>26</sup> The wolf populations in the states of Arizona and New Mexico, while reintroduced through a federal government program, cannot be characterized as having had the full benefits of federal protections, since the politics in that region have placed the federal recovery program in a state of disarray and the reintroduced wolf population there has, as a result, struggled mightily to survive.

*Muwekma Ohlone “Kaphan Umux” (Three Wolves) archeological site.*

Three research publications provide relevant information regarding wolf distribution, native status of the species and historical evidence of the cultural significance of wolves to some of California’s native people. All three papers involve research and analysis derived from an archeological site excavated near San Jose under the direction of Ohlone Families Consulting Services (OFCS), the archaeological consulting firm of the Muwekma Ohlone Tribe. Staff from the Center has previously discussed these research papers with the Department and we believe the Department has copies of all three. We submit the papers’ citations for inclusion in the Department’s status review for listing the gray wolf under CESA:

- Field, L.W. and A. Leventhal. "What Must It Have Been Like!": Critical Considerations of Precontact. Ohlone Cosmology as Interpreted through Central California Ethnohistory. *Wicazo Sa Review*, Volume 18, Number 2, Fall 2003, pp. 95-126 (Article). Published by University of Minnesota Press. *DOI: 10.1353/wic.2003.0013*.
- Jones, Barbara L. 2010. *Mythic Implications Of Faunal Assemblages From Three Ohlone Sites*. A thesis submitted to the faculty of San Francisco State University in partial fulfillment of the Requirements for the degree Masters of Arts in Anthropology. San Francisco, California. January 2010. 226 pp.
- Cambra, R., Leventhal, A., Jones, L., Hammett, J., Field, L. Sanchez, N. [Ohlone Families Consulting Services] and R. Jurmain [San Jose State Academic Foundation]. 1996. *Archeological Investigations at Kaphan Umux (Three Wolves) Site, CA-SCL-732: A Middle Period Prehistoric Cemetery on Coyote Creek in Southern San Jose, Santa Clara County, California*. Prepared for the Santa Clara County Traffic Authority and the California Department of Transportation, District 4. 568 pp.

A description of the site and findings as it relates to wolves is summarized, in part, in the following quoted portions from the Field and Leventhal paper:

“In the summer months of 1992, an archaeological excavation took place south of San José, California, under the direction of Ohlone Families Consulting Services (OFCS), the archaeological consulting firm of the Muwekma Ohlone Tribe. Members of the tribe unearthed the skeletal and artifactual remains of their ancestors, which were buried in two separate cemeteries that have been dated to 3000 and 1500 B.P., respectively. The Muwekma called the site (CA-SCL-732) *Kaphan Umux* or Three Wolves site, because the remains of three wolves, in addition to a number of other animal remains, were ritually interred among the human burials. . . . The animals buried at CA-SCL-732 included the whole bodies of three wolves interred in two graves. A sample of charcoal found in association with the single wolf burial and a sample of its bone generated dates of  $1500 \pm 30$  and  $2700 \pm 80$  B.P., indicating interment during Phase II of the Late Period. Two additional wolf skeletons were found in another grave with braided, uncharted yucca or soap root fiber cordage around their necks. The estimated age for these wolves has been determined from the uncharted cordage as  $4370 \pm 90$  B.P. . . . By “ritual burial,” we mean the deliberate integral of deceased animals or their body parts, often (but not always) accompanied by nonperishable grave goods, such as shell beads and ornaments, and other symbols of status (e.g., exotic materials) used in central California cultural systems, or the placement of animal parts in conjunction with the human burials.” (Field and Leventhal, 2003 at pp. 95-96.)

*San Francisco excavation site yields pre-historic wolf bone / New study launched.*

Within the past year, additional evidence has been discovered of wolf presence in the Bay Area, during the time before European contact. In 2012, in a prehistoric midden excavation in San Francisco, senior faunal analyst and archeological specialist Michael Stoyka of the Anthropological Studies Center at Sonoma State University (SSU) found a bone in the collection which he has identified as the fifth metatarsal bone from a wolf. (Figure 2.)

The SSU Anthropological Studies Center is now engaged in exploratory investigations aimed at discovering the distribution of *Canis lupus*, the gray wolf, in California, prior to AD 1750 (pre-European contact). Their research results ultimately will provide information that will deepen

the public's understanding of just how long gray wolves have been a part of California's natural history and heritage.



Figure 2. Wolf fifth metatarsal bone from excavation site in San Francisco, California that is 1200-1900 years old. In the figure, the dark-colored bone is the identified wolf bone. Above it are fifth metatarsals of a coyote and of a very large dog for size comparison. Sonoma State University Anthropological Studies Center. Photograph by Amaroq Weiss, October 2012.

### **MANAGEMENT RECOMMENDATIONS**

The recovery and conservation of wolves in California will take place in an atmosphere in which wolf management, post-federal delisting, has become even more contentious than when wolves were under federal control. It is likely the Department will come under tremendous political pressure to manage wolves in ways to keep the species' population at bare minimum levels, relegated to tiny patches of habitat, and lethally-controlled in response to conflicts. We believe California is able to take a different route. As has been the case with mountain lions in California, scientific studies that demonstrate the critical role of apex predators has resulted in

enhanced public appreciation and tolerance for coexisting with these species. Department policies and management strategies continue to evolve to reflect modern scientific understandings that ecosystems missing their top predators are impoverished landscapes, and that we can find ways to coexist with species like mountain lions and wolves.

Wolves in California should be managed according to the following principles:

- Wolf management should focus on conserving the species using an ecosystem-based approach. Efforts should focus on methods and strategies that will encourage populations of wolves to recover at numbers sufficient to restore ecologically-functioning relationships between wolves and their prey and the other plant and animal species and processes that make up a healthy ecosystem.
- Recovering and conserving wolves will require that they be allowed to develop populations across a range of habitats in areas where they can thrive. Long-range dispersal is an essential part of the life history of wolves and conservation measures implemented should allow for wolves to naturally distribute across all suitable habitat within the State.
- Wolves are habitat generalists and can live wherever humans will tolerate them. However, wolves do best in areas of low human settlement, few roads and where there is a good prey base. Habitat in California that fit these criteria should be protected against increased development of roads and human incursions, and should be managed to provide good habitat for elk and deer, the primary prey base for wolves in the western United States.
- While protected as endangered or threatened under State law, wolves should not be killed to prevent or resolve conflicts (except in defense of human life). Once recovered and delisted, lethal control for livestock-conflicts should be a last resort, after all feasible, circumstance-appropriate nonlethal tools and strategies have been exhausted. Wolves should never be killed for resolving conflicts related to wolf-livestock interactions that take place on open-range public lands.

- As highly social animals, wolves live in multi-generational family packs that help in pup-rearing, hunting and maintaining territories. Management of wolves has often relied heavily on killing wolves as a response to wolf-livestock conflicts. However recent experience suggests that killing members of wolf packs in fact increases the potential for more conflict. In Idaho last year, hundreds of wolves were killed in state-sanctioned hunting and trapping. Nevertheless, wolf-livestock conflict in Idaho rose nearly 75% above levels that had occurred there prior to the institution of wolf-hunting and trapping following federal delisting. Killing older, more experienced animals puts the pack social hierarchy into disarray and may cause packs to splinter. Without experienced leaders to guide the pack or to instruct young wolves how to hunt wild prey, more wolf-livestock conflict, not less, can be the result. Wolf management in California should take into account the vital need for wolf packs to remain intact and should use non-lethal methods to prevent and resolve any conflicts which may occur.
- Public lands grazing allotments in areas of good wolf habitat should be evaluated to determine whether certain allotments should be retired and to establish permit requirements that only nonlethal methods of wolf-livestock conflict prevention and resolution be used on these public lands.
- Collaborative efforts should be formed between the state wildlife agency, ranchers, non-governmental organizations and federal agencies to use non-lethal conflict-prevention methods that will keep both wolves and livestock safe.
- Wolves should not be managed through public hunting or trapping. Although wolves play a crucial role in fundamental ecological processes, they exist in the Lower 48 at population levels far below ecologically-functioning numbers. Their highly-social nature means that the deaths of pack members disrupt integral social behaviors. Wolf populations manage their own numbers via inter-pack strife as a result of territoriality and resource availability. There is no evidence that allowing hunting or trapping of wolves increases social tolerance for wolves. If anything, the hunting and trapping seasons on wolves that have been sanctioned under state management in the northern Rockies post-federal-delisting has demonstrated that the opposite is true.

- Steps should be taken to enhance habitat for wolf prey species such as deer and elk. Collaborative efforts should be formed between the Department , sports-hunting and conservation organizations to identify and secure funding sources for implementing habitat restoration projects that will benefit wild ungulates, human hunters and wolves.
- Public education about wolves is a critical component in recovering, conserving and managing the species. The Department should seek funding for and develop public education presentations and materials on a wide range of wolf-related topics, based on verifiable, accurate information about wolves. Topics should include (but not be limited to ) wolf biology and behavior; wolves’ ecological role in nature; wolf-livestock interactions and non-lethal preventative methods to reduce or prevent wolf-livestock conflict; wolf-wild ungulate interactions; physical features that distinguish wolves from other canids; wolf-human interactions/safety issues; conservation issues for wolves including the need for long-range dispersal, the ability for multiple populations in different locations to have genetic flow between them, and the need for secure core habitat to protect against human-caused mortality.
- Long-term monitoring of California’s wolf population will be necessary to determine whether populations are healthy and sustainable, and the Department should seek and secure adequate funding for this. A wolf-monitoring program should be developed that will alert staff to any risks to the long-term survival of wolves and thus enable the Department to respond quickly with adaptive management strategies.

## **CONCLUSION**

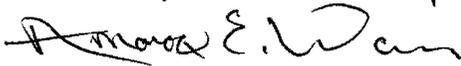
The Center supports listing of the gray wolf as an endangered species under CESA.

Ample evidence exists regarding the wolf’s historical presence in the state as a native species whose role as an apex predator not only filled a critical ecological niche in nature but also had cultural significance for California’s native peoples. Modeling studies have identified suitable habitat for wolves in California that may be essential to the species’ existence in the State.

Further, while OR-7 heralded the return of wolves to the State, the status of wolf populations in Oregon and Washington point to the likely dispersal of more wolves to California in the future.

Listing the wolf under CESA will provide the critical conservation mandate and legal protections which will be necessary to welcome the wolf home.

Sincerely,

A handwritten signature in black ink that reads "Amaroq E. Weiss". The signature is written in a cursive style with a large initial 'A'.

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Section 2050 *et seq.*

Section 2052

Section 2062

Section 2067

Section 2071 *et seq.*

Section 2074.2 (a)(2)

Section 2075.5

Section 4150

Section 4152

**California Code Of Regulations Cited**

14 CCR § 670.1

**United States Codes Cited**

16 U.S.C. § 1533 *et seq.*



May 6, 2013

California Department of Fish and Wildlife  
1812 Ninth Street  
Sacramento, California 95811  
Attn: Gray Wolf Status Report

**RE: Comments of the Society for Conservation Biology on the Listing of the Gray Wolf as a Threatened or Endangered Species under the California Endangered Species Act.**

The Society for Conservation Biology<sup>1</sup> (SCB), on behalf of its North America Section and its Humboldt State University Chapter, would like to offer the following comments on the California Department of Fish and Wildlife's (CDFW) review process to protect the gray wolf in California by listing the species as threatened or endangered under the California Endangered Species Act (CESA).<sup>2</sup> SCB supports the listing of the gray wolf as an endangered species under the CESA given its current status as nearly extirpated from the State of California. As apex predators, gray wolves play an important role in many ecosystems. The removal of wolves has been shown to result in significant changes to species' compositions in diverse ecosystems across their former range, and the return of wolves has been shown to result in cascading effects that often result in increased biological diversity. Because large areas of suitable wolf habitat exist in California, it is likely that wolves will continue to disperse into the State from source populations in Oregon and Washington. Therefore, it is important that the CDFW develop a management plan under the auspices of the CESA with the goal of recovery of gray wolves within California.

SCB believes that listing under the CESA will provide the CDFW with the necessary policy and material support to protect and restore this once-widespread species that has been extirpated from most of its historic range within California. The protection, conservation, and restoration of the gray wolf are consistent with the goals and purposes of the CESA, as well as its statutory text. SCB recognizes the significant challenges involved in managing a species that is nearly extirpated from the state. However, SCB is concerned about CDFW's evaluation of the petition to list the gray wolf, its apparent discounting of historic and anecdotal information regarding the former distribution of wolves in California, its discounting of the utility and applicability of habitat-based modeling regarding wolves derived from similar habitats and ecosystems in other portions of the western United States,

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<sup>1</sup> SCB is an international professional organization whose mission is to advance the science and practice of conserving the Earth's biological diversity, support dissemination of conservation science, and increase the application of science to management and policy. The Society's 5,000 members include resource managers, educators, students, government and private conservation workers in over 140 countries.

<sup>2</sup> California Fish and Game Code §§ 2050–2115.5.



and statements suggesting that species without a currently successful wild breeding population are not listable under the CESA. The roaming of a single gray wolf, resident in California from December 2011 through the March of 2013, certainly does not represent the historic range of the species within California. However, the movement patterns of this animal, known as OR-7, do help corroborate peer-reviewed models of suitable wolf habitat.

## **I. The Historic Range of the Gray Wolf in California and the Existence of Current Suitable Habitat Supports Listing of Wolf Under the CESA.**

The gray wolf historically occurred across most of North America, from as far north as the Arctic tundra, south through the high mountains and plateaus of Mexico, and from the maritime provinces of Canada, west to the Pacific. Wolves are habitat generalists, occupying diverse habitat types based largely on the abundance of prey, availability of den sites, ease of travel, and topography.<sup>3</sup> It is likely that gray wolves occupied a variety of habitats in California, where there was sufficient ungulate prey. In part, because of the extirpation or near extirpation of prey species such as the bison, Tule elk (*Cervus canadensis nannodes*), and pronghorn, it will always be difficult to precisely determine the historic range of wolves in the State.

Nevertheless, there is some consensus that gray wolves were present in the northern part of California and the Sierra Nevada mountains (Young and Goldman 1944, Hall 1981, Nowak 1995, USFWS 2008).<sup>4</sup> Schmidt (1987, 1991) reviewed the historical record of gray wolves in California back to the 1750s and determined that wolves likely were present in the Coastal range, the Central Valley, and the western slope of the Sierra Nevada at the time of European settlement.<sup>5</sup> Likewise, Shelton and Weckerly (2007) compared four early accounts of wolf distribution throughout the West to identify where wolves likely had occurred. These records indicate that wolves were likely to have occupied significant portions of California, including the Sierra Nevada mountains, the Modoc plateau and other mountainous areas of California north of San Francisco and Sacramento.<sup>6</sup> The CDFW report on the historic distribution of gray wolves in California indicates that wolves were present in the northern

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<sup>3</sup> Paquet, P.C. and L.N. Carbyn. 2003. Gray wolf: *Canis lupus* and allies. Pp. 482-510 in Feldhamer, G.A., B.C. Thompson, and J.A. Chapman, eds., *Wild Mammals of North America*. 2nd edition. Baltimore: Johns Hopkins University Press.

<sup>4</sup> Young, S.P. and E.A. Goldman. 1944. *The Wolves of North America*. Washington, DC: The American Wildlife Institute; Hall, E.R. 1981. *Mammals of North America*. New York: Wiley; Nowak, R.M. 1995. Another look at wolf taxonomy. Pp. 375-398 in *Ecology and conservation of wolves in a changing world: Proceedings of the second North American symposium of wolves*. Edmonton CA. Canadian Circumpolar Institute, University of Alberta. *Final rule designating the northern Rocky Mountain population of gray wolf as a distinct population segment and removing this distinct population segment from the federal list of endangered and threatened wildlife*. 73 Fed. Reg. 10514 (Feb. 27, 2008).

<sup>5</sup> Schmidt, R.H. 1987. Historical records of wolves in California. *WOLF!* 5(2): 31-35; Schmidt, R.H. 1991. Gray wolves in California: their presence and absence. *California Fish and Game* 77(2):79-85.

<sup>6</sup> Shelton, S. L., and F. W. Weckerly. 2007. Inconsistencies in historical geographical range maps: the gray wolf as an example. *California Fish and Game* 93:224-227.



portion of the State, and potentially as far south as the Santa Monica Mountains, north of present-day Los Angeles.<sup>7</sup>

While much of the gray wolf's historic habitat in California has likely been altered to the point it no longer is suitable (e.g., the Central Valley and other portions of the state that have been converted to agricultural purposes), large areas remain suitable for wolves. A substantial amount of scientific research demonstrates that the presence of public lands, and other lands with low road densities, is often a predictor of suitable wolf habitat (Thiel 1985, Mech 1988, Fuller et al. 1992).<sup>8</sup> This is primarily because roads allow for human access, which often results in greater wolf mortality. Likewise, the U.S. Fish and Wildlife Service has concluded that road density (as a surrogate for protected public lands, density of livestock, and human presence) is the best single predictor of habitat suitability for wolves.<sup>9</sup> Road density is a useful parameter because it is easily measured and mapped, and because it correlates directly and indirectly with human-related wolf mortality. Furthermore, roads directly increase wolf mortality through increased collisions with motor vehicles, intentional or accidental shootings, and the spread of infectious diseases from domestic dogs (Mech and Goyal 1993, Mladenoff et al. 1995).<sup>10</sup>

Carroll et al. (2006) used a spatially-explicit population model as a tool for addressing appropriate recovery goals and strategies for the gray wolf in the western U.S.<sup>11</sup> That model included an analysis of California and linked estimates of survival and fecundity for individual animals with GIS data on mortality risk and habitat productivity to predict "occupiable habitat." Model results identify large areas of habitat that are likely suitable for wolves, and suggest that much of the suitable wolf habitat will persist into the future, although the amount of available habitat will depend on the extent of future road infrastructure. Specifically, the 2006 model predicts that if current habitat trends continue, the central and southern Sierra Nevada will provide the largest area for a potential wolf population in California. Other areas of potentially suitable habitat include California's southern Cascades,

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<sup>7</sup> California Department of Fish and Game. 2012. Report to the Fish and Game Commission: Evaluation of the Petition from the Center for Biological Diversity, Big Wildlife, the Environmental Protection Information Center, and the Klamath-Siskiyou Wildlands Center to list Gray Wolf (*Canis lupus*) as an Endangered Species Under the California Endangered Species Act. Aug. 1, 2012. The California Department of Fish and Game was renamed the California Department of Fish and Wildlife on January 1, 2013.

<sup>8</sup> Thiel, R.P. 1985. Relationship between road densities and wolf habitat suitability in Wisconsin. *American Midland Naturalist* 113: 404-407; Mech, L. D. 1988. *The arctic wolf: living with the pack*. Stillwater, MN: Voyageur Press; Fuller, T.K., et al. 1992. A history and current estimate of wolf distribution and numbers in Minnesota. *Wildlife Society Bulletin* 20: 42-55.

<sup>9</sup> Final Rule to revise the list of endangered and threatened wildlife for the gray wolf (*Canis lupus*) in the Eastern United State, Initiation of Status Reviews for the Gray Wolf and for the Eastern Wolf (*Canis lycaon*). 76 Fed. Reg. 26086 (May 5, 2011).

<sup>10</sup> Mech, L.D., and S.M. Goyal. 1993. Canine parvovirus effect on wolf population change and pup survival. *Journal of Wildlife Diseases* 22:104-106; Mladenoff, D. J., T. A. Sickley, R. G. Haight, and A. P. Wydeven. 1995. A regional landscape analysis and prediction of favorable gray wolf habitat in the northern Great Lakes region. *Conservation Biology* 9:279-294.

<sup>11</sup> Carroll, C., et al. 2006. Defining Recovery Goals and Strategies for Endangered Species: The Wolf as a Case Study. *BioScience* 56:25-37.



the Modoc Plateau, and the Klamath Mountains. These areas have low human population density and few year-round or heavily traveled roads, and are predominantly public land. Carroll et al. (2006) noted the model's predictive limitations, especially with respect to making predictions in semiarid areas where the minimum threshold of prey availability would need to be determined with greater accuracy. See Figure One.

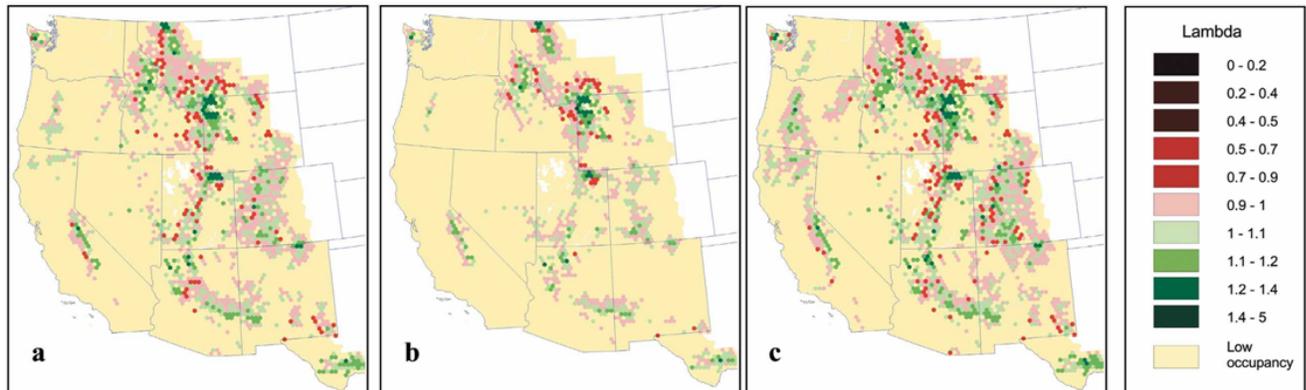


Figure One. Potential distribution and demography of wolves under three landscape scenarios: (a) current conditions; (b) future conditions, with projected human population in 2025 and increased road development on both private and unprotected public lands; and (c) current conditions with reduced road density on public lands. Source: Carroll, C., et al. 2006. Defining Recovery Goals and Strategies for Endangered Species: The Wolf as a Case Study. *BioScience* 56:25-37.

Subsequent studies have also concluded that significant areas of potentially suitable wolf habitat occur in California. In the process of evaluating the status of the gray wolf in the Pacific Northwest, the USFWS overlaid predictions from 3 habitat models: Carroll et al. (2006), Oakleaf et al. (2006) as extended to the Pacific Northwest, and Larsen and Ripple (2006).<sup>12</sup> Extensive areas in the regions described above are identified as suitable habitat by at least 2 of the 3 models. See Figure Two.

<sup>12</sup> Carroll, C., et al. 2006. Defining Recovery Goals and Strategies for Endangered Species: The Wolf as a Case Study. *BioScience* 56:25-37; Oakleaf, J.K., et al. 2006. Habitat Selection by Recolonizing Wolves in the Northern Rocky Mountains of the United States, *Journal of Wildlife Management* 70(2):554-563; Larsen T. and W.J. Ripple. 2006. Modeling gray wolf (*Canis lupus*) habitat in the Pacific Northwest. *U.S.A. Journal of Cons. Planning*, 2(1):30-61.

# FIGURE TWO

## Defining a potential boundary of the Pacific Northwest Distinct Population Segment (DPS) for the Gray Wolf

**- DRAFT -**

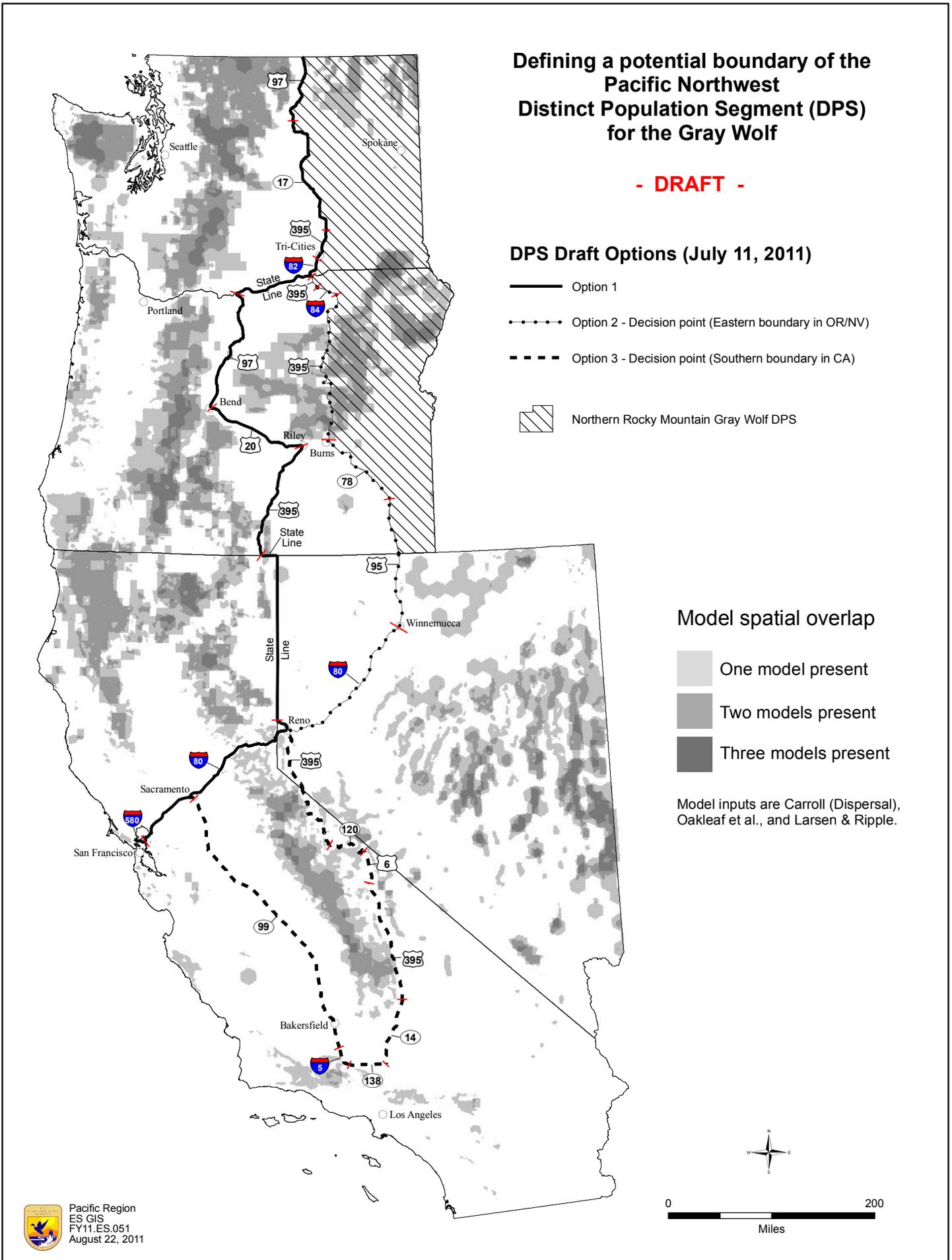
### DPS Draft Options (July 11, 2011)

-  Option 1
-  Option 2 - Decision point (Eastern boundary in OR/NV)
-  Option 3 - Decision point (Southern boundary in CA)
-  Northern Rocky Mountain Gray Wolf DPS

### Model spatial overlap

-  One model present
-  Two models present
-  Three models present

Model inputs are Carroll (Dispersal), Oakleaf et al., and Larsen & Ripple.





SCB is concerned by the CDFW's response to the listing petition, which either ignores or discounts several important peer-reviewed publications on habitat suitability in California. For example, the conclusions of Carroll et al. (2006) are treated as "speculation" because the models employed "have no certainty applied to them and have not been validated with scientific data to support or refute them."<sup>13</sup> SCB agrees that using models to project the number of wolves requires eventual verification. But, for a species that is as well studied as the gray wolf, there is little reason that the CDFW could not reasonably extrapolate, based on peer-reviewed models and experiences in other nearby States, and assess whether suitable habitat still remains in California. Using habitat models to guide reintroduction and restoration efforts is standard practice in modern wildlife management. And as explained by Oakleaf et al. (2006), these habitat-based models are validated with scientific data to support or refute them; though in this situation the data are derived from outside of California. For the CDFW to wait on taking protective actions for wolves until empirical data concerning habitat selection by wolves currently resident in California become available would defeat the purposes of the CESA because the CESA is designed to protect species in a precautionary manner, notwithstanding that science is always uncertain in some degree. SCB agrees that CDFW should continue to investigate the factors that impact gray wolf population size. However, these additional data are not necessary in order to make initial assessments of where suitable habitat remains. For example, the CDFW has determined that there are over 455,000 mule deer in California, and 12,000 elk in the State. Other relevant information, such as human population density and land use in California, is readily available, as are data regarding snow-pack conditions and road-density.

The approach employed by the FWS, Carroll et al. (2006), Larsen and Ripple (2006), and others represents a valid scientific approach for predicting the possible distributions of the gray wolf. Given the species' status as all but extirpated from California, an approach based on predictive modeling likely represents the best-available science with respect to wolf recovery in California. As noted above, SCB is concerned by several statements in the CDFW's response to the listing petition, which appear to articulate an incorrectly high burden for determining an endangered species' range. For example, the CDFW response to the petition states:

- Historical documentation and current data on a single known wolf in California do not provide enough information to analyze and determine the species range with any scientific certainty.<sup>14</sup>
- Historical range of wolves in California is inconclusive and there is no scientific evidence that establishes or supports hypotheses regarding specific range boundaries.<sup>15</sup>

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<sup>13</sup> CDFW, 2012. Report to the Fish and Game Commission: Evaluation of the Petition at 14.

<sup>14</sup> *Id.* at 15.

<sup>15</sup> *Id.* at 16.



- There is not enough information available about wolf abundance, either historically or currently, to analyze the abundance of wolves in California with scientific certainty.<sup>16</sup>
- Indirect information from other states with wolf populations may provide some insight into the potential habitat(s) necessary for the survival of wolves in California. However, unless wolves become established and are studied, some related details will remain scientifically uncertain.<sup>17</sup>

A requirement of scientific “certainty” or on-the-ground “evidence” regarding wolves’ historical range or abundance prior to taking action to conserve a previously extirpated species would virtually preclude achieving the goal of recovering native species formerly occurring in California. The CDFW does not need to determine the precise current or former abundance of wolves or the habitat requirements of wolves in California with “scientific certainty,” a standard that is generally unachievable and whose pursuit runs counter to the scientific method (which typically increases knowledge through refutation and inference based on probabilities and rigorous assessment of uncertainty). Furthermore, such a standard conflicts with the text of the CESA, which does not require scientific certainty prior to listing a species as threatened or endangered within the State, but rather an assessment based upon “the best scientific information available to the department.”<sup>18</sup> SCB has concluded that the approaches for assessing potential habitat developed by Carroll et al., Larsen and Ripple, and the FWS represent the best scientific information available regarding gray wolves and their potential for recovery in California. SCB notes that the movements of the single male wolf known as OR-7 from December 2011 through March of 2013 help to corroborate these models, given the fact that OR-7’s travels throughout Northern California were concentrated on public lands, where road densities and human presence are generally lower than on other, nearby lands. The movements of OR-7 also demonstrate that this area of northern California still retains sufficient habitat connectivity to allow dispersing wolves from Oregon or Washington to find sufficient suitable habitat to establish themselves in the State.

## **II. The CESA Provides the Needed Tools to Protect and Recover a Species That Has Been Extirpated or Nearly-Extirpated from California.**

Given the growing source populations in Oregon and Washington, and the connectivity between areas of suitable habitat in Oregon and California, it is likely that gray wolves will continue to disperse into California in the foreseeable future. As the CDFW acknowledges, based on the current distribution of wolves and the predicted distribution of suitable habitat in Oregon, it is most likely that dispersing wolves will first arrive and reside in Modoc or Siskiyou counties. However, SCB is concerned by the statement by CDFW in response to the listing population that states “there is no scientific certainty that the wolf population in Oregon will continue to increase and expand or that the population will disperse to California.”<sup>19</sup> While this statement is literally correct, it again appears that the CDFW is

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<sup>16</sup> *Id.* at 18.

<sup>17</sup> *Id.* at 20.

<sup>18</sup> California Fish and Game Code § 2074.6.

<sup>19</sup> CDFW, 2012. Report to the Fish and Game Commission: Evaluation of the Petition at 14.



improperly raising the threshold for listing the gray wolf based on an unreasonable, indeed unachievable standard of scientific certainty. The travels of the gray wolf OR-7, if nothing else, show that it is likely that wolves will continue disperse to California in the future.

A separate question has been raised about whether the CESA is designed to protect species that have been extirpated from California. At the public hearing regarding the listing of the gray wolf in California, the general counsel for the California Fish and Game Commission (CFG) recommended that the CDFW reject the listing petition, and stated the following to support this recommendation:

The concern I have [is] whether or not the existence of a single individual of a species in California establishes a population that can reproduce and establish itself... How do you manage and recover a species that in its current form is unable to reproduce at all?

The petition fails on its face because there isn't a population of that particular species in the State that can be managed for recovery... The petition fails to meet the goals of the legislature to protect it.<sup>20</sup>

The general counsel went on to present a hypothetical argument about whether or not California would have to protect the polar bear (*Ursus maritimus*) as an endangered species under the CESA if someone brought a single polar bear into California and let it roam wild, comparing that scenario to the listing of the gray wolf.

SCB is concerned about this analogy and, more generally, the legal and policy arguments made by the general counsel regarding the structure and purpose of the CESA. As an initial matter, a polar bear being dropped into California by a person is not in any way analogous to the situation facing gray wolves, which are in the early stages of recolonizing their historic range in the State, unaided. As a species that is native to California,<sup>21</sup> that was extirpated through non-natural mechanisms, and that has returned via natural dispersal, gray wolves present a fundamentally different situation than that of a non-native species being deliberately introduced into unsuitable habitat in a novel location.

SCB believes that the listing standard suggested by the CFGC counsel, hinging on the current ability of a population to breed in the wild is not consistent with the CESA, and ignores the urgent need for conserving critically endangered species. It is of course true that a single wolf does not represent a breeding population; nor would the presence of any number of male wolves in the State without a female member of the species. But, even the presence of both male and female wolves in California, a possibility that the CDFW acknowledges

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<sup>20</sup> California Fish and Game Commission October 3, 2012 Public Meeting at 5:58. Video available at: <http://www.cal-span.org/cgi-bin/media.pl?folder=CFG>

<sup>21</sup> As noted by the CDFW, gray wolves receive minimal protections under Fish and Game Code Section § 4152(a), which authorizes take of nongame mammals only by owners of the lands on which they are found (or their agents) and only if damaging property; *see also* § 4150: "All mammals occurring naturally in California which are not game mammals, fully protected mammals, or fur-bearing mammals, are nongame mammals."



given the difficulty in detecting wolves,<sup>22</sup> would still not guarantee that they would be able to locate each other or even, if they did, successfully reproduce. This is a problem that many critically endangered species face when their numbers fall to very low levels. When a species population falls to very low numbers, declining reproductive success can lead to a substantial risk of extinction (in addition to such factors as increased vulnerability to stochastic events).<sup>23</sup> However, there is nothing in the CESA that restricts listing to *breeding* populations of critically endangered species, let alone to those breeding naturally in the wild. In fact, such a standard would violate the intent of the CESA because the goal of the Act is to recover all endangered species, especially those at critically low population levels. For example, the California condor (*Gymnogyps californianus*) is listed as an endangered species under the CESA and the federal ESA. In 1987, the last 22, wild condors were brought in to captivity as a last-ditch effort to save the species from extinction.<sup>24</sup> In 1992, the U.S. Fish and Wildlife Service, the then California Department of Fish and Game (renamed in 2013 as the Department of Fish and Wildlife), and other cooperators began reintroductions of condors. But, it was not until 2006, in Big Sur, California, that the first re-introduced condors successfully hatched a wild-born chick.<sup>25</sup> It would make little sense to interpret the CESA to exclude protections for California Condors between 1986 and 2006 because there was no wild *breeding* population. By the logic of the CFGC counsel, the condor should have been removed from the list of endangered species because the species no longer possessed a wild breeding population within the state.

Likewise, it makes little sense that the CESA would only be able to provide protection to gray wolves once the species establishes a breeding population inside California. The CESA is designed to conserve native wildlife within California's state boundaries. The CESA defines "conservation" to mean the use of:

all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this chapter are no longer necessary. These methods and procedures include, but are not limited to, all activities associated with scientific resources management, such as research, census, law enforcement, habitat acquisition, *restoration* and maintenance, propagation, live trapping, and *transplantation*...<sup>26</sup> (emphasis added).

Thus, a species like the gray wolf can be conserved within the meaning of the CESA any time it is or could be present in the State, and its recovery can be promoted in California, including

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<sup>22</sup> CDFW, 2012. Report to the Fish and Game Commission: Evaluation of the Petition at 14, 17.

<sup>23</sup> See generally, Soulé, M. 1987. Viable Populations for Conservation. Cambridge, UK: Cambridge University Press.

<sup>24</sup> USFWS. 1986. California Condor Recovery Plan, available at: <http://www.fws.gov/hoppermountain/CACORecoveryProgram/PDF%20Fact%20Sheets/Recovery%20Plan%20of%20the%20California%20Condor,%20April%201996.pdf>.

<sup>25</sup> CDFW. 2013. California Condor. Available at [http://www.dfg.ca.gov/wildlife/nongame/t\\_e\\_spp/condor/](http://www.dfg.ca.gov/wildlife/nongame/t_e_spp/condor/) (last visited April 19, 2013).

<sup>26</sup> California Fish and Game Code § 2061.



using procedures such as the translocation of individual wolves to locations within the State that provide suitable habitat. Restoring the gray wolf to its historic habitat meets the larger goal of the CESA to protect endangered species that are “of ecological, educational, *historical*, recreational, esthetic, economic, and scientific value to the people of this state, and the conservation, protection, and enhancement of these species and their habitat is of statewide concern”<sup>27</sup> (emphasis added).

Notably, the CDFW has a history of taking proactive measures to restore endangered species protected under the CESA. In April of 2013, the CDFW reintroduced 10 female and four male Sierra Nevada bighorn sheep (*Ovis canadensis californiana*), a species protected as endangered since 1999, into the Sierra Nevada mountains.<sup>28</sup> The CDFW has also worked to restore the Tule elk and, as noted above, California Condor, the latter through the auspices of the CESA. Thus, the theoretical possibility that the recovery of wolves might someday require the CDFW to take similar actions is no bar to listing the species now.

## **CONCLUSION**

SCB supports the listing of the gray wolf as an endangered species under CESA given its current status as nearly extirpated from California, with occasional animals dispersing into the state. As apex predators, gray wolves could play important functional roles in many ecosystems in California. Because large areas of likely suitable habitat exist in California, and given that wolves are likely to naturally recolonize the State from source populations in Oregon and Washington, it is clear that there is potential for the reestablishment of breeding populations of the gray wolf. Therefore, the CDFW should develop a management plan, under the auspices of the CESA, with the goal of the recovery of gray wolves within California. Respectfully submitted on behalf of SCB, its North America Section, and its Humboldt State University SCB Chapter.

Sincerely,

John Fitzgerald, J.D.  
Society for Conservation Biology Policy Director

Niel Lawrence, J.D.  
North America Section Policy Committee Vice-Chair

Tom Sisk, Ph.D.  
North American Section Policy Committee Chair

Carlos Carroll, Ph.D.  
Society for Conservation Biology Policy Committee Vice Chair

Robert Shearer  
Humboldt State University Chapter President

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<sup>27</sup> California Fish and Game Code § 2051 (emphasis added).

<sup>28</sup> Cart, J. Bighorn herd reintroduced to Sierra Nevada area. Los Angeles Times. April 17, 2013. Available at: <http://articles.latimes.com/2013/apr/17/local/la-me-0418-bighorn-herd-20130418>.



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## Lee, Rhianna@Wildlife

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**Subject:** FW: Gray Wolf Petition (California Endangered Species Act) - Status Review for California  
**Attachments:** Scientific Peer Review of California Department of Fish and Wildlife Draft Status Report of the Gray Wolf.pdf; Scientific Peer Review of California Department of Fish and Wildlife Draft Status Report of the Gray Wolf.docx

**From:** Carlos Carroll [<mailto:carlos@klamathconservation.org>]  
**Sent:** Wednesday, November 13, 2013 3:20 PM  
**To:** Loft, Eric@Wildlife  
**Subject:** RE: Gray Wolf Petition (California Endangered Species Act) - Status Review for California

Dr. Loft,  
Thank you for your invitation to provide a scientific peer review of the California Department of Fish and Wildlife Draft Status Report of the Gray Wolf. I have attached my review in pdf and Word formats.  
Let me know if I can be of further assistance.

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Carlos Carroll, Ph.D.  
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Orleans, CA 95556

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**From:** Loft, Eric@Wildlife [<mailto:Eric.Loft@wildlife.ca.gov>]  
**Sent:** Friday, October 18, 2013 12:05 PM  
**To:** [carlos@klamathconservation.org](mailto:carlos@klamathconservation.org)  
**Subject:** Gray Wolf Petition (California Endangered Species Act) - Status Review for California

Dear Dr. Carroll,

Thanks for your tentative agreement to review the subject document attached here (WORD document plus PDF of appendix/figures). Please review the attached letter (PDF) describing our intent, purpose, and request of you as a reviewer. I understand that plans may change and you may not be able to review the document for us. If that is the case please let me know as soon as practical. Otherwise, thank you very much in advance for your expertise and insight regarding the document.

Please contact me by email or telephone if you have any questions/concerns about this effort.

Sincerely,

Eric

Eric R. Loft, Ph.D, Chief  
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Eric - I can review the document.

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November 13, 2013

## Scientific peer review of California Department of Fish and Wildlife Draft Status Report of the Gray Wolf

Dear Dr. Loft,

Thank you for your invitation of October 18, 2013, to provide a scientific peer review of the California Department of Fish and Wildlife Draft Status Report of the Gray Wolf. My research as a wildlife ecologist with the Klamath Center for Conservation Research in Orleans, California, has focused on habitat, viability, and connectivity modeling for a diverse group of threatened and endangered species ranging from large carnivores to rare and endemic plant species. I have also served on the Science and Planning Subgroup of the Mexican Wolf Recovery Team. I welcome the opportunity to use this expertise to evaluate the document. I group my review comments below by major themes, and note page and line number in parentheses (e.g., page 1 line 1 as (1/1)).

### General strengths and weaknesses of the document and status review process

The status review is a commendable effort by CDFW to develop an information base to support decisions by the California Fish and Game Commission regarding the gray wolf in California. The management recommendations suggested (22/8-27) are generally sound and based on lessons from other regions where wolf conservation and management plans have already been developed. This section, along with some of the other portions of the document, provide a good start towards developing a foundation for future wolf conservation and management in California.

However, other portions of the document need considerable more work if they are to provide an adequate information base for the Commission. I particularly noted the frequent use (8 times) of phrases such as "it is not possible to determine with certainty". Complete certainty is never possible in wildlife management, but such general statements are not informative and do not substitute for a rigorous evaluation of the degree of uncertainty and conversely the strength of evidence supporting alternate hypotheses. While it is laudable the CDFW recognizes the need for proactive planning through development of a wolf plan (18/39-42), it is problematic to defer even basic analyses that should have been contained within the status review, until completion of a wolf conservation/management plan at some unspecified future date.

### Habitat modeling issues

This is a central area of my expertise so I will devote most attention to this portion of the document. Generally, the comparison of the different habitat models (11/43) is overly superficial and uninformative. It is difficult to predict at this time which of several existing models (e.g., Carroll et al. (2006), Oakleaf et al. (2006), Larsen and Ripple (2006)) will have greatest success in predicting future wolf distribution in California. Each of these models have strengths and weaknesses. The model of

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Carroll et al. (2006) is conceptual, whereas that of Oakleaf et al. (2006) is empirically developed using data from the Northern Rocky Mountains. Therefore, while the Oakleaf et al. (2006) model might be most informative in the Northern Rocky Mountains, it may be less generalizable outside that region.

The comparisons between models made in the status report are largely inaccurate. For example, the distribution model of Oakleaf et al. (2006) was not “validated” by Smith et al. (2010). Smith et al. (2010) modeled survival rather than distribution. More importantly, of the variables that Smith et al. (2010) found important (survival was lower in areas where mule deer were the most common wild ungulate prey, where cattle and sheep were more abundant, and where more land was in agricultural cover or state management), one (sheep density) is also in the Oakleaf et al. model. However, that does not “validate” the latter model, although it offers indirect support for both the Oakleaf et al. model and other models which use one or more of these variables. Larsen and Ripple (2006) similarly found that forest cover and public (primarily federal) lands were (positively in this case) correlated with wolf distribution.

In this context, a multi-model strength of evidence approach that overlaid in GIS predictions from all available models would be more informative here. In fact, such an analysis has been completed by FWS and is available to CDFW (see Figure 2 in: Society for Conservation Biology. 2013. Comments of the Society for Conservation Biology on the Listing of the Gray Wolf as a Threatened or Endangered Species under the California Endangered Species Act). Rather than using such already available data, the CDFW status review seems to avoid providing comprehensive mapped information on potential habitat or distribution. For example, the extrapolation of the model of Oakleaf et al. 2006 provided with the report (Figure 2) is only for a portion of state, without explanation of why similar data is unavailable for central and southern California. Rather than providing information, the document simply states (13/29) “as no scientific data on habitat selection or preferences of gray wolf in California exists, it is not possible to describe essential habitat with certainty.” This boilerplate text is uninformative. Extrapolation of habitat models to new regions is common in wildlife management, and conclusions can be made with more or less confidence depending on the specific circumstances.

### Prey availability and ability as limiting factors in ability of California to support viable wolf populations

The discussion of prey availability in the status review contains primarily unsubstantiated opinion rather than analyses of empirical data. The document (15/19) states “California’s mule deer populations have been in a slow and steady decline since they peaked in the 1960’s, and are down an estimated 50-70 percent in the northern counties where the habitat would otherwise appear to be potentially suitable for gray wolf.” Given the extensive literature on wolf-prey dynamics (e.g. Fuller et al. 2003), it should be possible to analyze what wolf numbers could be supported by current deer and elk abundance in California. After that analysis was completed, the trend in deer numbers could be evaluated separately to evaluate if this wolf density could be sustained over time.

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Solely stating that deer numbers have declined from a peak (perhaps associated with a changes in extent of early seral habitat due to trends in timber harvest) tells the Commission little about the potential for California prey populations to support wolves. Additional statements such as “Until wolves attempt to enter and become established in California, it is not possible to determine with certainty whether a population can be sustained by the existing prey available in the state” (15/40) are also uninformative as described above.

It is incorrect to state (15/35 ) that previously-published habitat models do not incorporate deer density. Both Carroll et al. (2001) and Carroll et al. (2006) based ungulate (deer and elk) density estimates on a surrogate metric (the “greenness” variable) but incorporated an empirically-modeled relationship between greenness and deer/elk density. The equation of Fuller et al. (2003) can also be used to assess the ability of California deer populations to support wolf populations. For example, a large proportion of northern California supports deer densities  $\geq 2$  per  $\text{km}^2$ . Even without considering elk abundance, the Fuller model would predict that such areas could support more than 10 wolves per 1000  $\text{km}^2$ . I suggest that CDFW develop maps of potential wolf abundance from available deer/elk density estimates (Figure 5) and the Fuller et al. (2003) equation. The statement (24/19-22) that “habitat and prey base in California may be able to support a wolf population, but this remains uncertain, particularly with lower elk and deer densities in California” is not supported by available data. Previous analyses (Carroll et al. (2001, 2006) and predictions based on the Fuller equation strongly support the conclusion that California has sufficient prey to support a wolf population at current deer and elk densities. CDFW has presented no evidence to the contrary, but rather has neglected to analyze available data that would support or contradict their statement.

### Factors related to wolf mortality as limiting factors

Although there is support for concluding that prey abundance is not limiting for wolf populations that may inhabit California, it is less evident whether availability of secure habitat (areas with low mortality risk) will be limiting. The status review correctly identifies overexploitation (18/20) as an important risk factor. Mortality is a function of both the lethality of each person encountered (e.g., whether hunting is permitted) and the frequency with which wolves encounter humans. The number of roads and human population density serve as useful surrogates for encounter frequency even though human attitudes, regulations, and consequently lethality, vary between regions (Carroll et al. 2006).

In most regions of North America, the predominant factor in facilitating human-associated wolf mortality is road access. In California, timber harvest, especially on private industrial timber lands (which constitute 45% of forest land in California (19/25)), often involves creation of dense networks of access roads. Therefore, this variable should be evaluated and any potential trends which may reduce the extent of suitable habitat should be noted in the document. I agree that “large blocks of contiguous industrial forest lands; particularly those with restricted public access, would be expected to be high quality wolf habitat” (20/33). However, access management policies (e.g., locked gates) are not always

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effective at reducing wolf mortality given areas may remain frequently used (e.g., by employees). The potential role of industrial forestlands is a substantial source of uncertainty in projecting future wolf distribution in the Pacific states. Although other areas may become more important over time, wolf distribution in western North America is currently largely associated with large blocks of unroaded public lands. Some such areas do exist within California, especially in the southern Sierra Nevada. Supporting the conclusion that availability of secure habitat will be more limiting to California wolves than prey availability, Carroll et al. (2006) estimated the potential number of wolves in California as between 200-300 animals, which is far below an estimate based on prey availability (e.g., from the Fuller equation).

### Metapopulation connectivity and dispersal, especially from and to Oregon wolf populations

Given that California's wolf population will likely remain smaller than those in the Northern Rocky Mountains, it is important to consider the degree to which connectivity with adjacent populations in Oregon will support persistence of California wolf populations (16/32). A recent study (Carroll, C., R. J. Fredrickson, and R. C. Lacy. 2013. Developing Metapopulation Connectivity Criteria from Genetic and Habitat Data to Recover the Endangered Mexican Wolf. Conservation Biology [Online Early]) found that populations connected by at least 0.5 genetically-effective migrants per generation were projected to experience reduced threats from small population size (e.g., lower risk of loss of genetic diversity and consequent effects on viability).

Although the document correctly notes (16/36) that Northern Rocky Mountain wolves have shown no known problems due to small population size, those reintroduced populations were created from a deliberately diverse group of founders from different areas of western Canada. Founder diversity might be lower in California wolf populations founded from a few dispersers. Again, this suggests the importance of maintaining connectivity to Oregon wolf populations.

### Historic distribution and current habitat availability for the Mexican wolf in southeastern California

Due to serving on the Science and Planning Subgroup of the Mexican Wolf Recovery Team, I have reviewed available data on that subspecies. I suggest that the status report must consider the historical distribution and currently available habitat for Mexican wolf habitat in southeastern California more extensively. For example, the statement (12/11, 24/6-9) that "the likelihood of wolves entering California from Arizona is so remote", is incorrect from a biological standpoint, as suitable habitat in California is within dispersal distance of the Mexican Wolf Experimental Population Area (MWEPA). If this statement is instead based on current regulations regarding recapture of wolves leaving portions of Arizona and New Mexico, then it may not be correct in the future given that those regulations are currently under revision.

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The document should cite (4/46) recent research by the Wayne lab at UCLA (Hendricks et al. in prep.), which documented historic records of Mexican wolves in California, confirmed their identity as Mexican wolves via genetic analysis, and projected that suitable habitat was currently present in southeastern California. The status report is thus incorrect in stating (12/14-16) that such information does not currently exist. More generally, at (5/16) it would be relevant to cite and discuss evidence (e.g., 1) Leonard, J. A., C. Vilá, and R. K. Wayne. 2005. Legacy lost: genetic variability and population size of extirpated US grey wolves (*Canis lupus*). *Molecular Ecology* 14:9-17, 2) Vonholdt, B. M., J. P. Pollinger, D. A. Earl, J. C. Knowles, A. R. Boyko, H. Parker, E. Geffen, M. Pilot, W. Jedrzejewski, B. Jedrzejewska, V. Sidorovich, C. Greco, E. Randi, M. Musiani, R. Kays, C. D. Bustamante, E. A. Ostrander, J. Novembre, and R. K. Wayne. 2011. A genome-wide perspective on the evolutionary history of enigmatic wolf-like canids. *Genome Research* 21) of a regional gradient or cline in genetic identity of North American wolves rather than the hard subspecific boundaries hypothesized by previous taxonomic work.

### Minor suggested edits

(12/12) No DPS is currently designated for the Mexican wolf subspecies. There is a proposal to list the subspecies “where found”, which would not involve a DPS designation.

(15/32-33) This sentence needs editing “In California, the habitat for enough ungulate prey to sustain a viable wolf population in California is in need of restoration to increase deer and elk populations.”

(6/10) It would be informative to show a map based on Newland and Stoyka 2013 (the information could be added to Figure 1).

(3/36) “feasible” is the wrong word here.

Key references on historic wolf distribution in California should be added:

Schmidt, R.H. 1991. Gray wolves in California: their presence and absence. *California Fish and Game* 77(2):79-85.

Shelton, S.L., and F.W. Weckerly. 2007. Inconsistencies in historical geographical range maps: the gray wolf as an example. *California Fish and Game* 93:224

### Conclusion

In conclusion, it is laudable the CDFW recognizes (18/39-42) the need for proactive management through development of a wolf conservation and management plan. The status report, if revised based on peer review, can support this process. In contrast, the “not warranted” finding provisionally proposed by CDFW is not proactive, in that it fails to anticipate the likely continued dispersal of wolves into California from Oregon and the consequent need for protection of those individuals under CESA. As the report states (13/5), not all Oregon wolves are detected and collared. Therefore it is possible that

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not all wolves dispersing to California have been detected. The fact that OR-7 is currently in Oregon (12/24-25) should not prevent consideration that other uncollared wolves may have already dispersed from Oregon to California or that OR-7 may again re-enter California. Basing status determinations on the temporary absence of individuals of the species from the state appears arbitrary. If the status review had been completed more rapidly, OR-7 would have still resided in California and the opposite conclusion would have been reached in regards to listing. Rather than using a dubious interpretation of CESA to decline to list species due to its temporary and uncertain absence from state, California should follow the example of Washington and Oregon in using the relevant state statutes to protect colonizing wolves while at the same time developing multi-stakeholder plans that proactively resolve wolf conservation and management issues.

Sincerely,

Carlos Carroll,  
Klamath Center for Conservation Research,  
e-mail: [carlos@klamathconservation.org](mailto:carlos@klamathconservation.org)

**Subject:** FW: Gray Wolf Petition (California Endangered Species Act) - Status Review for California  
**Attachments:** CFW.doc; ATT00001.htm

**From:** Bob <[rwayne@ucla.edu](mailto:rwayne@ucla.edu)>  
**Date:** November 20, 2013, 10:23:49 AM PST  
**To:** "Loft, Eric@Wildlife" <[Eric.Loft@wildlife.ca.gov](mailto:Eric.Loft@wildlife.ca.gov)>  
**Subject: Re: Gray Wolf Petition (California Endangered Species Act) - Status Review for California**

Dear Eric,

I attach some comments, but I have to admit that I am not sure how useful they will be to you and your staff. I thought this report would deal with delisting questions, rather than only the status, which is a little hypothetical at this point since there are no wolves in California and historical information is scant and sketchy. The preliminary genetic data we have suggests only that the Mexican wolf was present in Southern California, and that other historic California haplotypes are similar to Canadian and Rocky Mountain wolves. The perhaps less expected finding is the presence of BC coastal wolf haplotypes in historic wolves from Oregon and in the present-day population in Washington State. I think this form does not fall under the current DPS (they are sometimes called "rain wolves" and live in coastal rainforest environments from Vancouver Island to Southeast Alaska and differ from inland Rocky Mountain wolves). This wolf variety perhaps deserves recognition as taxon of special concern. Something to think about given the chance of lawsuits from environmental organizations. We are working on getting our new genetic findings submitted for publication so they will be more directly useful to you. Please let me know if I can help in other ways.

Best regards,

Bob  
On Oct 18, 2013, at 12:12 PM, Loft, Eric@Wildlife wrote:

Dear Dr. Wayne,

Thanks for your tentative agreement to review the subject document attached here (WORD document plus PDF of appendix/figures). Please review the attached letter (PDF) describing our intent, purpose, and request of you as a reviewer. I understand that plans may change and you may not be able to review the document for us. If that is the case please let me know as soon as practical. Otherwise, thank you very much in advance for your expertise and insight regarding the document.

Please contact me by email or telephone if you have any questions/concerns about this effort.

Sincerely,

Eric

Eric R. Loft, Ph.D, Chief  
Wildlife Branch

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**From:** Bob [<mailto:rwayne@ucla.edu>]  
**Sent:** Thursday, September 26, 2013 11:17 AM  
**To:** Loft, Eric@Wildlife  
**Subject:** Re: Gray Wolf Petition (California Endangered Species Act) - Status Review for California

Dear Eric,

I would be happy to help.

Bob Wayne  
UCLA

On Sep 26, 2013, at 2:03 PM, "Loft, Eric@Wildlife" <[Eric.Loft@wildlife.ca.gov](mailto:Eric.Loft@wildlife.ca.gov)> wrote:

## Review of “A Status Review of the Gray Wolf (*Canis lupus*) in California”

In this status report, the taxonomy, natural history and ecology of wolves is reviewed with a focus on California and the Pacific Northwest. The report also discusses some of the problems and challenges with wolf restoration in California. In general, this is an accurate summary, although it is plagued by the lack of historical information about wolves in California and therefore must be used cautiously for management. Moreover, there is over reliance on information from early wolf research and in places, the report should be updated with newer information from more recent research on Yellowstone wolves which has more similarity to the future situation in California.

### Specific points:

**1. Systematics.** A problem with the systematics of Pacific Coast wolves is that the taxonomy is dated and most treatments derive from the original morphologic work done by Goldman (1944) over 80 years ago. The definition of appropriate conservation units for conservation, especially for highly mobile species such as the gray wolf, has advanced considerably since then (e.g. Funk et al., 2012; Crandall et al., 2000; Moritz, 1994). Even recent treatments such as Chambers et al. (2012) merely reviews past studies and attempts to develop a consensus of historical taxonomic treatments. For conservation units, such as the DPS, definitions need to be based on the most current scientific thinking. There is abundant literature largely ignored by Chambers et al. suggesting wolf populations are structured by ecology and identifies West Pacific Coast, central Rockies and Mexican wolf genetic units (Fig. 1; Geffen et al., 2004; Carmichael et al., 2007; Musiani et al., 2007; Munoz-Fuentes et al., 2009; vonHoldt et al., 2011). Moreover, the taxonomic conclusions of the Chambers et al. paper are

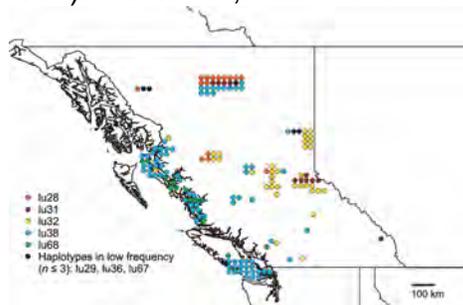


Figure 1. Distribution of the coastal haplotype in BC wolves indicated by the blue colored dots.

controversial, at least in my opinion and there are very few morphologically based systematists left that study taxonomy below the species level in carnivores. Nowak was among the last from the morphological tradition who studied wolf taxonomy, and the tools and phenetic approach he used date to the 1960s.

Genetic data largely do not support past wolf subspecies definitions and hence any conclusions made from the historical morphologically based taxonomy are tenuous

at best.

Our preliminary genetic analysis of historic specimens from the West Coast suggests at least the Mexican wolf and Rocky Mountain wolf existed historically in California, although this is based on a small sample size. Both the Rocky Mountain wolf and Coastal wolf haplotypes are currently found in the extant Washington and Oregon population, representing migration from Idaho

and British Columbia. Historically, we have identified three individuals with Coastal haplotypes in historic specimens from Oregon, suggesting the present of the Coastal wolf there before extirpation, and the likelihood that they existed in California and Washington given the dispersal abilities of wolves and the presence of suitable habitat at that time. If the goal of restoration is to return past patterns of diversity to the US Pacific coast, the re-established wolf population in California should contain contributions from all three entities. Finally, of these three entities, only the Rocky Mountain wolf is part of the western DPS, the Mexican wolf is a listed entity and the coastal BC wolves have not been formally considered under the current USFWS wolf delisting plan.

## **2. Factors affecting the ability of the gray wolf to survive and reproduce.**

This is good list. However, I think dog-wolf interactions (including predation and hybridization) needs to be discussed as well. I think the California model for wolves may be closer to that in Italy, where limited abundance of natural game and high human densities have brought wolves in close contact with humans. This human contact is enhanced by the presence of livestock, carcasses or garbage. Hybridization has been common in Italy with the formation of mixed packs. The extent of hybridization will depend on the size of the wolf population and their distribution in California.

**3. Prey availability and competition.** Here and elsewhere, the affect of gray wolves is viewed as largely negative. This view is somewhat contradicted by a body of recent evidence showing ecosystem benefits to wolf reintroduction, the so-called trophic cascade. For example, new evidence suggests bears actually benefit from wolves through the increased number of carcasses, as do ravens and other carnivores (Ripple et al., 2013). The diminished grazing pressure by ungulates resulting from wolf predation allows the regrowth of trees, and restoration of historical habitats. Wolves also change the trophic structure of the carnivore community, reducing the abundance of coyotes, which are a major predator of livestock and allow smaller carnivores, such as red foxes, to increase in number. The report needs to incorporate and comment on this literature. I think it is a critical void in the current treatment, and biologists such Chris Wilmer at UCSC could be consulted.

I am uncertain why the authors of the report believe there is not sufficient prey density of deer to support wolves. This needs to be clarified.

**4. Small population size.** There are two distinct models for wolves in California, one passive and the other proactive. The first is the current situation, where a wolf or two may visit infrequently, but packs are not readily established because the habitat is not suitable, mortality is high, or the number of migrants is so low that individuals cannot find mates. This may become more likely if Oregon strongly limits their wolf populations and will entail genetic loss through small population size, inbreeding and low levels of gene flow. The second is that wolves are established in greater number, perhaps assisted by translocation from

Oregon, into areas of abundant game and low conflict. This is more like the Yellowstone model where 34 wolves were translocated from sites in Canada. Wolves that migrate naturally in California could perhaps be moved to these pre-designated areas to enhance genetic diversity. The latter model takes a proactive stance and attempts to manage the recolonization of wolves to reduce conflict and enhance success. In contrast, the former passive model may increase the potential for conflict and establishment of wolves in inappropriate areas.

**5. Disease.** Mange is potentially a greater concern than mentioned since it is now devastating the wolf population in Yellowstone. One potential threat that is not mentioned is anticoagulant poisoning that is a problem for coyotes and bobcats statewide and has even killed mountain lions in Los Angeles.

**6. Over-exploitation.** Successful restoration of wolves in California will likely result in a managed hunt as it has in other states. However, there is very little treatment of this issue in the report. If hunting is not allowed because of public pressure as for the mountain lion, it will likely be a problem for management. I would think the State would like to consider this problem in the report more thoroughly.

**7. Wolf conservation and management.** Until the state develops a plan for the wolf, it is hard to comment on this section.

**8. Summary of key findings. The number of wolves that could be supported.** I am surprised that some rough estimation of wolf abundance historically in California was not attempted. If there are 4000-6000 mountains today, wouldn't we expect the historic number of wolves to be at least that large?

## References

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Crandall, K.A., Bininda-Emonds, O.R.P., Mace, G.M., and Wayne, R.K. Considering evolutionary processes in conservation biology. *Trends in Ecology & Evolution* 15: 290-295 (2000).

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Ripple WJ, Beschta, RL, Fortin, JK, and Charles T. Robbins. 2013. Trophic cascades from wolves to grizzly bears in Yellowstone. *J. Animal Ecology*. DOI: 10.1111/1365-2656.12123

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California Department of Fish and Wildlife webpage for Gary Wolf (*Canis lupus*) <http://www.dfg.ca.gov/wildlife/nongame/wolf/>

CDFW's gray wolf webpage, at the bottom of the page, includes an RSS feed/link for Updates on Wolf OR-7

<http://californiagraywolf.wordpress.com/>

## Gray Wolf OR7

Updates on wolves migrating into California

### Recent Updates



• [jordantverso](#) 12:43 pm on April 1, 2014 [Permalink](#)

### [Apr. 1 – January and February 2014 updates](#)

In 2014, OR7 has briefly entered California on two occasions. The first instance occurred on January 11 and lasted until January 13 when he returned to Oregon. The second instance was on February 5 when he was present for only a few hours before returning to Oregon, where he remains. Oregon does not post daily location information on wolves. For more information, please visit <http://www.dfw.state.or.us/wolves/>.