PETITION TO LIST THE GRAY WOLF *(CANIS LUPUS)* AS AN ENDANGERED SPECIES UNDER THE CALIFORNIA ENDANGERED SPECIES ACT

CENTER FOR BIOLOGICAL DIVERSITY

BIG WILDLIFE

ENVIRONMENTAL PROTECTION INFORMATION CENTER

KLAMATH SISKIYOU WILDLANDS CENTER

February 27, 2012

NOTICE OF PETITION

For action pursuant to Section 670.1, Title 14, California Code of Regulations (CCR) and ections 2072 and 2073 of the Fish and Game Code relating to listing and delisting endangered and threatened species of plants and animals.

I. SPECIES BEING PETITIONED:

Common name: Gray wolf
Scientific name: *Canis lupus*

II. RECOMMENDED ACTION: List as endangered

The Center for Biological Diversity, Big Wildlife, Klamath-Siskiyou Wildlands Center and Brett Hartl submit this petition to list the gray wolf as endangered throughout its range in California pursuant to the California Endangered Species Act (California Fish and Game Code §§ 2050 et seq., "CESA"). This petition demonstrates that the gray wolf clearly warrants listing under CESA based on the factors specified in the statute.

III. PETITIONERS

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I hereby certify that, to the best of my knowledge, all statements made in this petition are true and complete.

Signature: _____
Date: _____

The Center for Biological Diversity is a nonprofit conservation organization with 320,000 members and online activists dedicated to the protection of endangered species and wild places. http://www.biologicaldiversity.org

Big Wildlife was formed in 2006 to provide a voice for keystone wildlife and top carnivores such as cougars, bears, coyotes, and wolves in North America. Dynamic, gutsy, and visionary, Big Wildlife combines innovative media strategies with nuts and bolts grassroots organizing.

The Environmental Protection Information Center is a community-based, nonprofit organization that works to protect and restore forests, watersheds, coastal estuaries, and native species in Northern California. http://www.wildcalifornia.org

The Klamath-Siskiyou Wildlands Center is an advocate for the forests, wildlife and waters of the Rogue and Klamath Basins. We work to protect and restore the extraordinary biological diversity of the Klamath-Siskiyou region of southwest Oregon and northwest California.

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EXECUTIVE SUMMARY

The Center for Biological Diversity, Big Wildlife Environmental Protection Information Center and Klamath-Siskiyou Wildlands Center submit this petition to list the gray wolf (*Canis lupus*) as an endangered species under the California Endangered Species Act (CESA), Fish and Game Code § 2070 *et seq*. The gray wolf was extirpated from California in the 1920s. In December of 2011, a male wolf known as OR-7, wearing a GPS radio collar, crossed the border between Oregon and California, marking the first confirmed wolf within California in over 80 years.

With a source population in Idaho and growing source populations in eastern Oregon and the Washington Cascades, wolves are likely to continue to naturally disperse to California, and to establish a breeding population. Indeed, current scientific research indicates that multiple breeding populations of wolves could be established within California, particularly in low-populated areas in the northern portion of the state, the northern Coast Range, and in the Sierra Nevada Mountains (Carroll et al. 1998, 2001, 2006). Carroll et al. (2001), for example, concluded that the southern Cascades and Modoc Plateau could probably support 190 to 470 wolves.

As a native species to California which has been virtually absent from California for over 80s, the gray wolf clearly meets the statutory threshold for listing under CESA. In order to survive and recover, wolves need protection from the following threats, which form the basis for considering whether a species warrants protection under CESA:

Present or Threatened Destruction, Modification, or Curtailment of Habitat or Range

Although the gray wolf is not dependant on a particular habitat type, it becomes increasingly susceptible to a wide variety of threats when its habitats are destroyed or fragmented by roads or development. Roads and habitat loss create a greater likelihood that wolves will encounter humans, domestic animals, and various human activities. These encounters may result in wolves being hit by motor vehicles, being controlled by government agents after becoming involved in depredations on domestic animals, being shot intentionally by unauthorized individuals, being trapped or shot accidentally, or contracting diseases from domestic dogs. Population growth has been dramatic in California and is predicted to continue, including in areas where suitable wolf habitat remains. This continued population growth and concurrent development is a threat to gray wolf survival and recovery in California.

Disease or predation

Many diseases and parasites are found among Canids. Wolves are susceptible to a number of viral and bacterial diseases, including rabies, canine parvovirus, canine distemper, canine adenovirus (canine hepatitis), canine herpesvirus, and leptospirosis (Kreeger 2003, FWS et al. 2007, Mech et al. 2008, Almberg et al. 2009, ODFW 30 2010). Some of these can create significant problems in wolf recovery and require monitoring and appropriate treatment to ensure that they do not spread and impact the entire population. However, while some individuals may die from diseases, they generally are not considered a significant problem to wolf recovery. None of these appear to threaten the long-term population viability of wolves, although periodic

outbreaks of canine distemper have been linked to poor pup survival and population decline in some years (FWS et al. 2007, 2010, 2011, Almberg et al. 2009). Rabies may limit population growth in some situations (Kreeger 2003). Most wolves in North America have had regular exposure to many of the canine diseases over the years and survive.

Human Predation

Human predation is a primary threat to gray wolves. At the time of the gray wolf's 1978 listing, FWS recognized that "[d]irect killing by man . . . has been the major direct factor in the decline of wolves in the conterminous United States." 43 Fed. Reg. at 9611. Through the enforcement of take prohibitions for gray wolves, the federal ESA has been crucial to allowing progress towards wolf recovery for gray wolves. Yet even with the ESA's protections, human-caused mortality – including vehicle accidents and illegal trapping and shooting – has accounted for a significant number of wolf deaths. In Washington State, for example, as many as five members of the protected Lookout Pack were killed by residents of Twisp, Washington, who were later caught attempting to mail a wolf carcass to Canada.

Within California there is a substantial livestock industry that has historically dealt with predators by lethal control. Government and industry sponsored trapping and hunting of wolves was instrumental in driving the gray wolf towards extirpation in California, and the chief reason that the gray wolf was listed as an endangered species throughout the United States.

There can be no doubt that human-caused mortality in the form of illegal killings and vehicle strikes is a primary threat to gray wolves in California and in areas that serve as source populations for wolves dispersing back to the state. This threat is likely to increase in California as human development continues to fragment wolf habitat and in the absence of protection under the California Endangered Species Act and a state recovery plan.

The inadequacy of existing regulatory mechanisms

The gray wolf is not currently listed as an endangered or threatened species under the California Endangered Species Act. The gray wolf is also absent from the California list of game animals. (See CA §250–479). As a result, the gray wolf does not fall under any regulatory scheme within the state, despite being a species that is native to California. Given the possibility that gray wolves are already naturally dispersing to California and have a high potential to do so in the near future, the California Department of Fish & Game must address this anomaly by listing the gray wolf as an endangered species and develop a management scheme for the protection of the gray wolf. Such an action would be consistent with the approach taken by the States of Oregon and Washington, both of which listed the gray wolf at a time when no individuals were presently located within their respective State boundaries.

Protection under the federal ESA for gray wolves that reach California is not sufficient to ensure their long-term survival in California. FWS has dedicated almost no resources to wolf recovery in California. In particular, the agency has never developed a recovery plan for wolves in the state, meaning there is no prescribed management and no recovery goals for wolves in California. The agency has also recently stated that it is considering removing protections for

wolves in the lower 48 states, concluding: "[i]t is likely that revision of the 1978 gray wolf listing into finer-scale taxonomic or population units will result in removal of the Act's protections in areas of the historical *C. lupus* range, such as the Great Plains States and areas of the western States, that do not support extant wolf populations *and* do not play a role in the recovery of any of the four gray wolf entities." 76 Fed. Reg. 26,086. In this proposal, FWS did state their intention to consider protecting a Pacific Northwest distinct population segment that included California, but there is no guarantee that the agency will in fact protect such a population.

As a top predator and keystone species, gray wolves play an important role in many ecosystems. Wolves limit ungulate herbivory of saplings in sensitive riparian areas and thereby aid beavers, songbirds and fish whose habitat is enhanced through growth of riparian trees (Ripple and Beschta 2003). Wolves have also been found to aid fox (*vulpes ssp.*) and pronghorn (*Antilocapra americana*) populations by controlling coyotes (*Canis latrans*), which are intolerant of foxes and disproportionately prey on pronghorn fawns (Berger and Gese 2007; Smith et al. 2003, Berger et al 2008). These results indicate that broader recovery of wolves would benefit many species and overall ecosystem integrity. The extirpation of gray wolves has likely impacted biological communities throughout California. It is reasonable to assume that, if wolves were present historically in California, their removal allowed coyotes to move into new areas or to reach higher population densities. This may explain the high mortality rate of the San Joaquin kit fox (*Vulpes macrotis mutica*), caused by predators, chiefly coyotes (O'Farrell 1984). Recovering the gray wolf to its former range in California would likely bring similar benefits to ecological communities within the state and would restore a lost part of California's natural heritage.

I. PROCEDURAL HISTORY & CESA LISTING PROCESS

Recognizing that certain species of plants and animals have become extinct "as a consequence of man's activities, untempered by adequate concern for conservation," (Fish & G. Code § 2051 (a)) that other species are in danger of extinction, and that "[t]hese species of fish, wildlife, and plants 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." (Fish & G. Code § 2051 (c)) the California Legislature enacted the California Endangered Species Act ("CESA").

The purpose of CESA is to "conserve, protect, restore, and enhance any endangered species or any threatened species and its habitat...." Fish & G. Code § 2052. To this end, CESA provides for the listing of species as "threatened" and "endangered." "Threatened species" refers to a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of special protection and management efforts. Fish & G. Code § 2067. "Endangered species" refers to a "native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease." Fish & G. Code § 2062.

The Fish and Game Commission ("Commission") is the administrative body that makes all final decisions as to which species shall be listed under CESA, while the Department of Fish and Game ("Department") is the expert agency that makes recommendations as to which species warrant listing. The listing process may be set in motion in two ways: "any person" may petition the Commission to list a species, or the Department may on its own initiative put forward a species for consideration. "Petitions shall include information regarding the population trend, range, distribution, abundance, and life history of a species, the factors affecting the ability of the population to survive and reproduce, the degree and immediacy of the threat, the impact of existing management efforts, suggestions for future management, and the availability and sources of information. The petition shall also include information regarding the kind of habitat necessary for species survival, a detailed distribution map, and any other factors that the petitioner deems relevant." Fish & G. Code § 2072.3. In the case of a citizen proposal, CESA sets forth a process for listing that contains several discrete steps.

Upon receipt of a petition to list a species, a 90-day review period ensues during which the Commission refers the petition to the Department, as the relevant expert agency, to prepare a detailed report. The Department's report must determine whether the petition, along with other relevant information possessed or received by the Department, contains sufficient information indicating that listing may be warranted. Fish & G. Code § 2073.5.

During this period interested persons are notified of the petition and public comments are accepted by the Commission. Fish & G. Code § 2073.3. After receipt of the Department's report, the Commission considers the petition at a public hearing. Fish & G. Code § 2074. At this time the Commission is charged with its first substantive decision: determining whether the Petition, together with the Department's written report, and comments and testimony received, present sufficient information to indicate that listing of the species "may be warranted." Fish & G. Code § 2074.2. This standard has been interpreted as the amount of information sufficient to "lead a reasonable person to conclude there is a substantial possibility the requested listing could occur." Natural Resources Defense Council v. California Fish and Game Comm. 28 Cal.App.4th at 1125, 1129.

If the petition, together with the Department's report and comments received, indicates that listing "may be warranted," then the Commission must accept the petition and designate the species as a "candidate species." Fish & G. Code § 2074.2. "Candidate species" means a "native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that the commission has formally noticed as being under review by the department for addition to either the list of endangered species or the list of threatened species, or a species for which the commission has published a notice of proposed regulation to add the species to either list." Fish & G. Code § 2068.

Once the petition is accepted by the Commission, then a more exacting level of review commences. The Department has twelve months from the date of the petition's acceptance to complete a full status review of the species and recommend whether such listing "is warranted." Following receipt of the Departments status review, the Commission holds an additional public hearing and determines whether listing of the species "is warranted." If the Commission finds that the species is faced with extinction throughout all or a significant portion of its range, it must

list the species as endangered. Fish & G. Code § 2062. If the Commission finds that the species is likely to become an endangered species in the foreseeable future, it must list the species as threatened. Fish & G. Code § 2067.

Notwithstanding these listing procedures, the Commission may adopt a regulation that adds a species to the list of threatened or endangered species at any time if the Commission finds that there is any emergency posing a significant threat to the continued existence of the species. Fish & G. Code § 2076.5.

Despite the fact that the gray wolf was extirpated from the state in the 1920s and has recently made a return, the California Fish & Game Commission ("Commission") has not yet protected the species under the California Endangered Species Act.

II. ECOLOGY OF THE GRAY WOLF

A. Species Description

Gray wolves (*Canis lupus*) are the largest member of the family *Canidae* (Mech 1970) and resemble some large breeds of domestic dogs, such as Alaskan malamutes and German shepherds. Females on average weigh from 80–85 pounds and males from 95–100 pounds (Mech 1970), though considerable clinal variation in size exists from the Arctic to central Mexico (Young and Goldman 1944). The heaviest recorded wolf was a 175-pound male from east-central Alaska, though males seldom exceed 120 pounds and females are seldom over 100 pounds (Mech 1970).

Wolves' acute hearing and exceptional sense of smell -- up to 100 times more sensitive than that of humans -- make them well adapted to their surroundings and to finding food (Mech 1970). In addition, researchers estimate that a wolf can run as fast as 40 miles an hour, enabling them to catch much of the prey they find. Wolves have been known to travel 120 miles in a day, but they usually travel an average of 10 to 15 miles a day (Mech 1970).
Wolves live, travel, and hunt in packs averaging from four to seven animals, consisting of an alpha, or dominant pair, their pups, and several other subordinate or young animals. The alpha female and male are the pack leaders, tracking and hunting prey, choosing den sites, and establishing the pack's territory (Mech 1970). The alpha pair mate in January or February and the female gives birth in spring, after a gestation period of about 65 days. Litters may contain from one to nine pups, but usually consist of around six. Pups have blue eyes at birth and weigh about one pound. Their eyes open when they are about two weeks old, and a week later begin to walk and explore the area within the den. Wolf pups grow rapidly, reaching 20 pounds at two months. A wolf pup is the same size as an adult by the time he or she is about a year old, and reaches reproductive maturity by about two years of age (Mech 1970).

Wolf pups romp and play fight with each other from a very young age. Scientists think that even these early encounters establish hierarchies that will help determine which members of the litter will grow up to be pack leaders. All adults share parental responsibilities for the pups. They feed the pups by regurgitating food for them from the time the pups are about four weeks old until they learn to hunt with the pack.

Pups that do survive remain with their parents for at least their first year, while they learn to hunt. During their second year of life, when the parents are raising a new set of pups, young wolves may remain with the pack or spend periods of time on their own. If the latter, they generally return in autumn to spend their second winter with the pack (Mech 1970). By the time wolves reach sexual maturity, at around two years of age, however, they generally leave their natal pack permanently to find mates and territories of their own (Mech and Boitani 2003a, Treves et al. 2009). Dispersal may be to unoccupied habitat near their natal pack's territory or it may entail traveling much longer distances before locating vacant habitat, a mate, or joining another pack. Wolves appear to disperse preferentially to areas occupied by other wolves, using scent marking and howling to locate other animals (Ray et al. 1991). In northwestern Montana, from 1985 to 1997, 53% of tagged wolves (30 of 58) dispersed from their natal territories to establish new territories or join other existing packs; 59% of males (10 of 17) and 49% of females (20 of 41) dispersed (Boyd and Pletscher 1999). Males dispersed at an average age of 28.7 months and traveled an average of 70 miles, whereas females averaged 38.4 months old at dispersal and moved an average of 48 miles. Males and females, combined, traveled an average of 60 miles (range 10-158 miles), with 17% of dispersing individuals moving more than 100 miles.

Dispersals can occur in any month, but are somewhat more frequent in January- February (courtship and breeding season) and May-June (Boyd and Pletscher 1999). Maximum dispersal distances of more than 680 miles have been recorded with actual travel distances exceeding 6,000 miles. A wolf that dispersed from Gardiner, MT to western Colorado where she was illegally killed by Compound 1080 poison in March 2009 traveled a straight line distance of 400 miles in six months but daily GPS locations showed she actually walked over 3,000 miles. The average dispersal distance of northern Rocky Mountain (NRM) wolves is about 60 miles (FWS et al. 2011). Wolves are capable of traveling such distances over periods of a few weeks or months. Dispersing individuals typically have lower survival rates than non-dispersing wolves (Pletscher et al. 1997). Dispersal has been regularly documented among and between populations in Montana, Idaho, Wyoming, and bordering areas of British Columbia, thereby increasing genetic exchange across the region (Bangs et al. 1998, Mack and Laudon 1998, Smith et al. 2000). Dispersal paths crossed international boundaries, state boundaries, public and private land boundaries, under various land uses and agency jurisdictions.

Wolves communicate through facial expressions, body postures, scent-marking, growls, barks, whimpers and howls. Howling can mean many things: A greeting, a rallying cry to gather the pack together or to get ready for a hunt, an advertisement of their presence to warn other wolves away from their territory, spontaneous play or bonding. Pups begin to howl at one month of age. The howl of the wolf can be heard for up to six miles. When wolves in a pack communicate with each other, they use their entire bodies: Expressions of the eyes and mouth, set of the ears, tail, head and hackles, and general body posture combine to express excitement, anxiety, aggression, or acquiescence. Wolves wrestle, rub cheeks and noses, nip, nuzzle, and lick each other. They also leave "messages" for themselves and each other by urinating, defecating, or scratching the ground to leave scent marks. These marks can set the boundaries of territories, record trails, warn off other wolves, or help lone wolves find unoccupied territory. No one knows how wolves get all this information from smelling scent marks, but it is likely that wolves are very good at distinguishing between many similar odors (Mech 1970).

B. Taxonomy

The gray wolf is a mammal in the order *Carnivora*, family *Canidae*, genus *Canis*, and species *Canis lupus*. Based on skeletal and cranial measurements and pelage, Young and Goldman (1944) identified 23 subspecies of gray wolves. Further morphological and genetic studies, however, have not supported designation of these various subspecies. Using multivariate analysis of several hundred skulls, Nowak (1995) consolidated the wolf into five subspecies (figure 1). Of these, *C.l. nubilus* was identified as occurring across much of the western U.S., including California, and the western half of British Columbia, Canada. In a study on the genetic variability of gray wolves, Leonard et al. (2005) found that "gene flow was extensive across the recognized limit of the subspecies." More recently, vonHoldt et al. (2011) used new techniques for genetic analysis to asses over 48,000 loci of wolf-like species from around the world and found "distinct populations on the British Columbian coast, Northern Quebec, and interior North America."

Although the above studies suggest that the historic distribution of the gray wolf included some degree of population structure, they also suggest that there was a great deal of intermixing. The most likely subspecies occupying California was *C. l. nubilus*, but given the long dispersal distances documented for individual wolves, it is quite possible that other subspecies intermixed with California wolves. On the current landscape, *C. l. nubilus* is still represented in British Columbia and eastern Canada and Washington State. Wolves in the northern Rocky Mountains likely include a mix of *C. l. nubilus* and *C. l. occidentalis*. Both Washington State and the northern Rocky Mountains are likely source populations for recolonization of wolves to California. Because of the lack of clarity in wolf taxonomy and the ability of wolves to move and intermix over long distances, the U.S. Fish and Wildlife Service (FWS) has long recognized and protected wolves at the species level simply as *Canis lupus* (FWS 1978). We likewise hereby petition for protection of the gray wolf (*Canis lupus*) at the species level under the California Endangered Species Act. It is noteworthy that the differences between the various recognized subspecies were quite subtle and likely did not result in substantial differences in prey selection or ecological role.

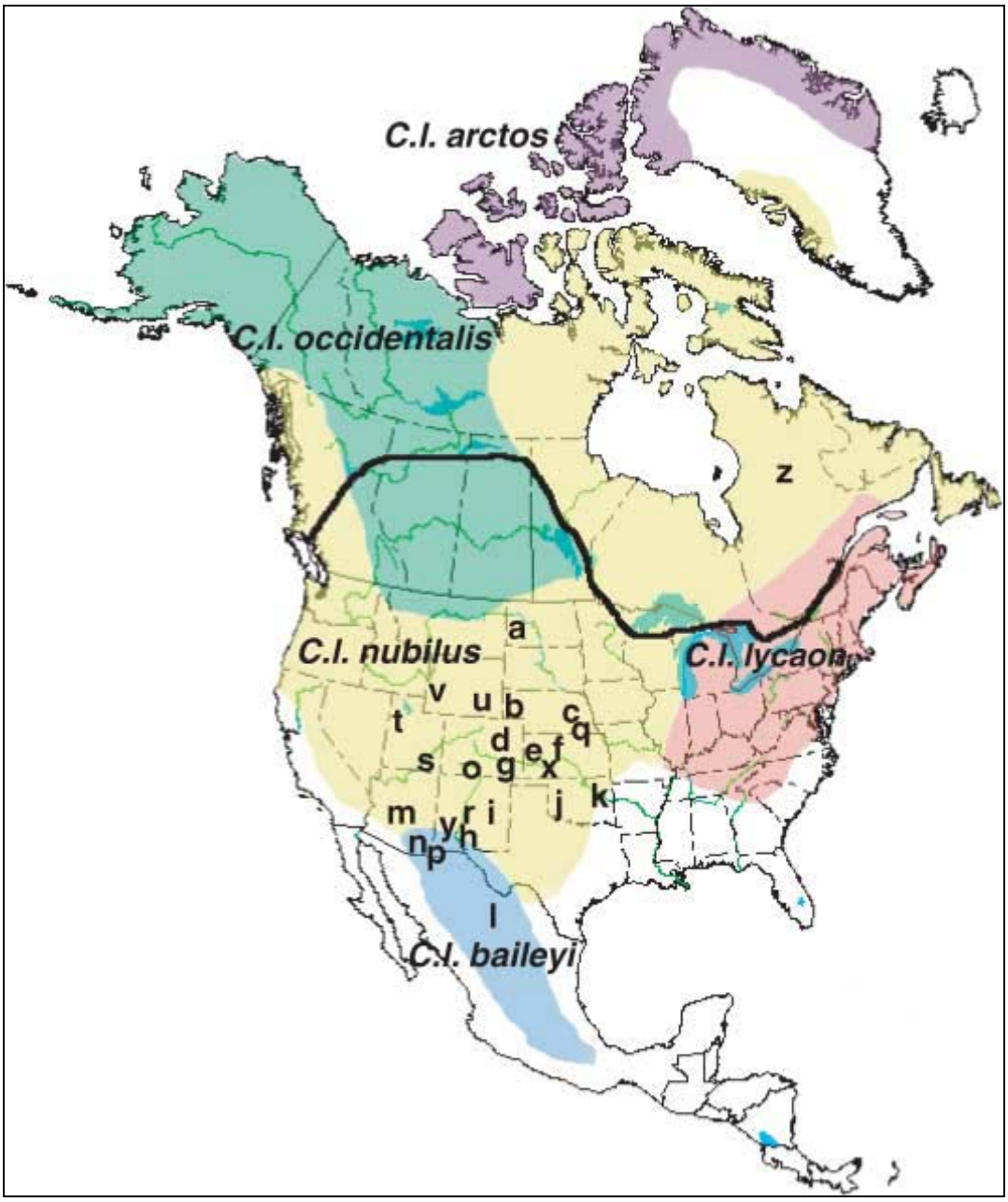

Figure 1. Historic distribution of the gray wolf in North America and the five defined subspecies (Nowak 1995). The Solid line marks the northern limit of extirpartion of wolves in the lower 48 states.

C. Diet

Gray wolves are opportunistic carnivores that are keenly adapted to hunt large prey species, such as deer, elk, moose, caribou, bison and bighorn sheep. Ungulate species comprise different proportions of wolf diets, depending on their relative abundance and distribution within territories. In the central and northern Rocky Mountains of the U.S. and Canada, elk are often the primary prey of wolves, but deer and moose are more important in some areas. In coastal Alaska and British Columbia, black tailed deer are the major prey (Darimont et al. 2004, 2009, Person et

al. 1996). Wolves also prey on smaller animals such as snowshoe hare, beaver, rabbit, opposum and rodents, scavenge carrion, and even eat fish and vegetation. In addition to ungulates, wolf scat collected in Yellowstone National Park in 1998 contained the remains of voles, ground squirrels, snowshoe hares, coyotes, bears, insects, and plant matter (Smith 1998). Research in northwestern Montana has also documented non-ungulate prey such as tree squirrels and other small rodents, ruffed grouse, ravens, striped skunks, beavers, coyotes, porcupines, and golden eagles (Boyd et al. 1994, Arjo et al. 2002). In coastal Alaska and British Columbia, wolves include salmon and marine mammals in their diet (Person et al. 1996, Darimont et al. 2003, 2008, Watts et al. 2010).

Wolves scavenge opportunistically on vehicle and train-killed ungulates, winterkills, and on kills made by other carnivores, particularly cougars. Wolves in northwestern Montana scavenge the butchered remains of domestic livestock at rural bone yards and big game animals at carcass disposal sites. Wolves also kill and feed on domestic livestock such as cattle, sheep, llamas, horses, and goats, although wild prey are their preferred food (Mech 1970).

D. Hunting Behavior

A pack establishes an annual home range or territory and defends it from trespassing wolves. From mid-April to early May until September or early October, pack activity is centered at or near the den or rendezvous sites, as adults hunt and bring food back to the pups. Rendezvous sites are specific resting and gathering areas that are used by wolf packs after pups emerge from the den. These sites are often in wet meadows (Ausband et al. 2010) or forest openings near the den, but sometimes are several miles away. Adults will carry small pups to a rendezvous site. Breeding females make use of den or rendezvous sites, whereas use by nonbreeders in the pack is more variable (Demma and Mech 2009). By September, pups travel and hunt with the pack. The pack hunts throughout its territory until the following spring.

Wolves use different areas of their territory daily, which suggests rotational use that may improve hunting success (Demma and Mech 2009), and territory boundaries and sizes may vary from year to year. Similarly, a wolf pack may travel in its territory differently from one year to the next because of changes in prey availability or distribution, conflicts with neighboring packs, or the establishment of a new neighboring pack. Other attributes such as elevation, land use, land ownership patterns, prey species present, and relative prey abundance make each pack's territory unique. Rich (2010) reported that territory size, in general, increases with greater terrain ruggedness (which tends to reduce prey availability and vulnerability), higher human densities, and higher levels of lethal control, but decreases with larger numbers of neighboring packs.

E. Survivorship, Mortality and Population Trajectory

Few wolves in the wild live more than 4-5 years (Fuller et al. 2003), although maximum age can reach 15 to 16 years (Ausband et al. 2009, Young and Goldman 1944). Wolves die from a variety of causes, which are usually classified as either natural or human-caused. Natural deaths result from territorial conflicts between packs, injuries while hunting prey, old age, disease, starvation, or accidents. In populations protected from human-caused mortality, most wolves die

from either being killed by other wolves usually belonging to neighboring packs, disease, or starvation (Mech et al. 1998, Peterson et al. 1998, FWS et al. 2011).

Natural mortality probably has little or no effect on most populations in the western U.S., where humans are the largest cause of wolf mortality as a whole and are 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). Mitchell et al. (2008) reported that humans were responsible for 71-87% of wolf deaths in five of six regions of Idaho, Montana, and Wyoming from 1979 through 2005, whereas only 23% of mortalities in Yellowstone National Park were human-related. Human-caused mortality includes control actions to resolve conflicts, illegal killings, legal take, and car and train collisions. Research on radio-collared wolves between 1984 and 2004 in Montana and Idaho determined that, on average, an estimated 10% of the wolves in these states died annually from control actions, 10% from illegal killing, 3% from human-related accidents, and 3% from natural causes (FWS et al. 2011). In 2010, human-caused mortality removed 179 wolves in Montana (24% of the state's wolf population), 142 (17%) in Idaho, and 56 (13%) in Wyoming (FWS et al. 2011). Mortality is higher among younger wolves, dispersers, members of small packs, and wolves occurring in regions with reduced amounts of public lands (Smith et al. 2010).

In the absence of human-caused mortality, wolf populations primarily increase or decrease through the combination and interaction of wolf densities and prey densities (Keith 1983, Fuller 1989). Actual rates of change depend on whether the wolf population is pioneering vacant habitat or whether the population is well-established. Degree and type of legal protection, agency control actions, and regulated harvest also influence population trends. Once established, wolf populations can withstand high mortality rates, provided that reproductive rates are also high and immigration continues (Fuller et al. 2003).

Previous research suggests that mortality rates of ~30% to 50% should be sustainable and that human-caused mortality is largely compensatory (Mech 2001, Fuller et al. 2003, Adams et al. 2008). However, a study that modeled population growth as a function of human harvest for Northern Rocky Mountain (NRM) wolves and other populations, found that the maximum human offtake for stable or increasing wolf populations was 22% for NRM wolves and 24% for other wolf populations (Creel and Rotella 2010). These human offtake estimates were consistent with observed declines in NRM wolves when human harvests were 23%-24%.

Low-density wolf populations can increase rapidly if protected and prey is abundant. Wolf populations in the Greater Yellowstone and Idaho areas exceeded all expectations for reproduction and survival after their initial reintroductions (Bangs et al. 1998). Populations became reestablished in both areas within two years, rather than the predicted three to five years, and pup production and survival were high. However, once densities become high enough, social interactions among packs intensify, causing intraspecific conflict and increased competition for food. These factors eventually cause populations to level off or decline (Keith 1983, Fuller 1989). Wolf populations in six regions of Idaho, Montana, and Wyoming increased at mean annual rates of 16-56% through 2005 (Mitchell et al. 2008). Some of the packs that formed in this region persisted, but others did not, due to illegal killing, control actions where livestock depredation had been repetitious, and for unknown reasons. Wolf populations in the Great Lakes

region have experienced variable growth rates. Annual population growth rate in the 1990s was 37.4% in Michigan, 22.1% in Wisconsin, and 4.6% in Minnesota, with slower growth in the 2000s to 12.3%, 11.1%, and 3.6%, respectively (Wydeven et al. 2009).

F. Habitat Requirements

Wolf research, as well as the expansion of the wolf range over the last two decades, has shown that wolves can successfully occupy a wide range of habitats and are not dependent on wilderness areas for their survival (FWS 2000). During the mid- to late-1980s, the earliest colonizing wolf packs in northwestern Montana had territories averaging 382 square miles in size (Ream et al. 1991). Average territory size in this region fell to 185 square miles by the late 1990s (FWS et al. 2000), probably as new packs filled in suitable unoccupied habitat. In western Montana, territory size currently averages about 230 square miles per pack (Rich 2010) but can reach 300 square miles or larger (USFWS et al. 2011). In 1999, Idaho wolf packs had average territory sizes of 360 square miles, with individual pack territories ranging from 141 to 703 square miles (USFWS et al. 2000).

As with other aspects of their ecology, wolves are generalists in their habitat use. Within their historical geographic distribution, wolves occurred in every habitat containing large ungulates, including forests, deserts, prairies, swamps, tundra, and coasts (Fuller et al. 2003). Elevations ranging from sea level to mountains were occupied. Wolves are adaptable enough that they will also enter and forage in towns and farms, cross highways and open environments, and den near sites heavily disturbed by people such as logging sites and military firing ranges (Fuller et al. 2003). Surviving wolf populations in much of western North America, including the northern Rocky Mountain States and British Columbia, predominantly inhabit forests and nearby open habitats, with prey availability and extent of human tolerance strongly influencing occupancy.

Wolves in the northern Rocky Mountain States have demonstrated a greater tolerance of human presence and disturbance than previously thought characteristic of the species. It previously was believed that higher elevation public lands would comprise the primary occupied habitats (Fritts et al. 1994), but most wolves in this region prefer lower elevations and gentle terrain where prey are more abundant, particularly in winter (Boyd-Heger 1997). Of the 94 documented packs in Idaho that survived during 2009, nearly all occupied territories that were wholly or predominantly on U.S. Forest Service lands (USFWS et al. 2011). In contrast, most packs in Montana exist on lands with a diversity of property owners and uses. These packs move through a complex matrix of public, private, and corporate-owned lands, with the average territory in northwestern Montana comprised of about 30% private land (USFWS et al. 2011).

Landowner acceptance of wolf presence and use of private lands is highly variable in space and time. Given the mobility of the species and the extent to which private and public lands are intermingled, it is not unusual for wolves to traverse each of these ownerships in a single day. Human land uses range from dispersed outdoor recreation, timber production or livestock grazing, to home sites within the rural wildland interface, hobby farming/livestock, or full-scale resort developments with golf courses. Private lands may offer habitat features that are attractive to wolves, so some packs may use those lands disproportionately more than other parts of their territories. In some settings, geography dictates that wolf packs use or travel through private

lands and coexist in close proximity with people and livestock. Land uses may predispose a pack to conflict with people or livestock, although the presence of livestock does not make it a foregone conclusion that a pack will routinely depredate (Bangs and Shivik 2001, Sime et al. 2007).

Although wolves are able to utilize human dominated landscapes, ultimately their ability to survive in these areas is dependent on human tolerance and the willingness of livestock operators to take necessary precautions to avoid losses. A number of studies have either found that road density is a primary predictor of wolf habitat suitability or used it as a predictor of suitable wolf habitat (Mladenoff et al. 1995, Mladenoff et al. 1999, Carroll et al. 2001, Carroll et al. 2006). This is primarily because roads allow human access facilitating legal or illegal killing of wolves. That wolves are limited by human persecution is well recognized. FWS has concluded that road density is the best single predictor of habitat suitability for wolves (FWS 2011).[1] Several studies demonstrated that wolves generally did not maintain breeding packs in areas with a road density greater than about 0.9 to 1.1 linear miles per sq mi (0.6 to 0.7 km per sq km) (Thiel 1985, Mech et al. 1988, Fuller et al. 1992). Road density is a useful parameter because it is easily measured and mapped, and because it correlates directly and indirectly with various forms of other human-related wolf mortality factors. A rural area with more roads generally has a greater human density, more vehicular traffic, greater access by hunters and trappers, more farms and residences, and more domestic animals. As a result, there is a greater likelihood that wolves in such an area will encounter humans, domestic animals, and various human activities. These encounters may result in wolves being hit by motor vehicles, being controlled by government agents after becoming involved in depredations on domestic animals, being shot intentionally by unauthorized individuals, being trapped or shot accidentally, or contracting diseases from domestic dogs (Mech et al. 1988, Mech and Goyal 1993, Mladenoff et al. 1995). Thus, although wolves can live nearly anywhere with sufficient ungulate prey densities, they do best in areas of low human density predicted by low road densities.

G. Role in Ecosystems

The wolf is a top-level or apex predator in the ecosystems in which it occurs, where it has few, if any, significant competitors or predators. Some ecosystems may have more than one apex predator, such as wolves and grizzly bears in the Greater Yellowstone ecosystem. Despite the generally small number of apex predator species, they typically influence the abundance and behavior of subordinate predator species (Soulé et al. 1988, Prugh et al. 2009). Coyotes, raccoons, and foxes are common examples of subordinate predators. In the absence of an apex predator, the role of these predators can change as they become more abundant, select different prey, or take over the functional status of apex predator. Alteration of predator-prey dynamics

[1] FWS summarized threats to wolves in the Great Lakes in the May 5, 2011 proposed rule. 76 Fed. Reg. 26086. Although FWS's threats analysis is aimed at justifying the removal of federal protections from gray wolves in the Great Lakes region, it summarizes information relevant to eastern wolves in the Great Lakes region and elsewhere. As such, this petition utilizes information supplied in that proposed rule.

can produce significant changes across trophic levels in a food web, which are referred to as a trophic cascade[2] (Hairston et al. 1960, Beschta and Ripple 2009).

As indicated above, wolves can affect ecosystem components through predation, trophic cascades, and other processes. These include: (1) limitation of herbivore prey abundance and changes in prey behavior, (2) removal of inferior prey individuals and stimulation of prey productivity, (3) limitation of some non-prey abundance, and (4) increased food availability for scavengers and small carnivores (Mech and Boitani 2003b). Regulation of large herbivore abundance and behavior by wolves can result in alterations to vegetation patterns (structure, succession, productivity, species composition, and species diversity), thereby potentially affecting many wildlife species residing in an ecosystem (Berger and Smith 2005). Research at Yellowstone National Park and other locations have linked wolf predation on elk and associated changes in elk behavior to the localized resurgence of woody browse species such as aspen, cottonwood, and willows (Smith et al. 2003, Ripple and Beschta 2004, Beschta 2005, Beschta and Ripple 2007, 2010). This in turn has allowed beaver and songbird numbers to increase. Wolves have also been found to aid fox (*vulpes ssp.*) and pronghorn (*Antilocapra americana*) populations by controlling coyotes (*Canis latrans*), which are intolerant of foxes and disproportionately prey on pronghorn fawns (Berger and Gese 2007; Smith et al. 2003, Berger et al 2008). A return of wolves to California will almost certainly result in similar benefits for a range of species found in the state.

At Grand Teton National Park, Berger et al. (2001) hypothesized that overbrowsing of riparian zones by moose, following the eradication of wolves and grizzly bears, had produced changes in vegetation structure that resulted in pronounced reductions or elimination of a number of neotropical migrant bird species (e.g., calliope hummingbird, willow flycatcher, gray catbird, yellow warbler, MacGillivray's warbler, fox sparrow, and black-headed grosbeak).

Reduced tree and shrub coverage in riparian areas may also increase stream temperatures and erosion, thereby potentially harming trout, salmon, and other fish. Initial research by Beschta and Ripple (2008, 2009) suggests that overbrowsing by elk during the past century or so has caused substantial changes in riparian plant communities in Olympic National Park, including severe declines in the recruitment of black cottonwood and bigleaf maple. This in turn may have caused increased riverbank erosion and channel widening. Probable reductions in the amount of large woody debris in river channels during this period have likely reduced rearing habitat for salmon, steelhead, and resident fish. These changes in river ecology have probably also lowered the amount of aquatic invertebrate prey (including emerging adult insects) available for fish, birds, and bats.

Removal of younger, older, and debilitated prey animals by wolves (Mech 1970, 2007, Kunkel et al. 1999, Mech and Peterson 2003, Smith et al. 2004) can leave prey herds comprised of a greater proportion of animals of prime age and in good health, which may in turn result in higher productivity in prey populations (Mech and Boitani 2003b). Preliminary evidence suggests that wolf predation can also change the occurrence of some diseases in prey populations, causing

[2] Trophic cascades occur when predators in a food web suppress the abundance of their prey, thereby freeing the next lower trophic level from predation. The concept is important for understanding the negative effects of removing top predators from food webs.

either reduced prevalence through the removal of infected individuals or increased prevalence where greater herding behavior enhances transmission (Wild et al. 2005, 2011, Barber-Meyer et al. 2007, Cross et al. 2010).

III. DISTRIBUTION OF GRAY WOLF IN CALIFORNIA

A. Historic distribution and range

The gray wolf historically occurred across most of North America, Europe, and Asia. In North America, gray wolves formerly occurred from the northern reaches of Alaska, Canada, and Greenland to the central mountains and the high interior plateau of southern Mexico. Shelton and Weckerly (2007) demonstrated that there is considerable divergence in the extent of historic wolf habitation in California, depending on the sources of information used by various authors in making their distribution maps (Young and Goldman 1944, Hall 1981, and Nowak 2002). There is consensus that gray wolves were present in the northern part of California and the Sierra Nevada (USFWS 2008). But there are also data and other information that suggests that gray wolves were present in most of California prior to European settlement, although details on the abundance and density of wolves in some portions of the state are lacking.

Schmidt (1987, 1991) thoroughly reviewed the historical record of gray wolves in California back to the 1750s. Early accounts from the 1750s to the 1850s indicate that wolves were present in the Coastal range from San Diego to San Francisco, the Central Valley, and the western slope of the Sierra Nevada foothills and mountains, when these areas were being explored and settled. Early naturalists observed wolves in what is now the San Diego and Los Angeles areas. These sightings can be corroborated by fossil discoveries of wolves in Kern, Los Angeles, and San Bernardino Counties. Schmidt describes an early Russian explorer, Von Kotzebue, who observed wolves around the San Francisco Bay area and the Sacramento-San Joaquin Valley in 1830. From 1851 through 1900, as settlement of California progressed, the distribution of sightings changed significantly.[3] By 1901, wolves were only observed in the Sierra Nevada, northern California, and other remote locations, although Young and Goldman (1944) and Hall (1981) tell of a wolf killed in Los Angeles County in 1918 and a gray wolf trapped in the Providence Mountains in San Bernardino County in 1922, as well as probable occupation of areas near Mono Lake and Mount Dana in Mono County in 1930. Shelton and Weckerly (2007) compared the results of four early accounts of wolf distribution throughout the West to identify where wolves likely had occurred, which indicate the wolves were likely to have been distributed in significant portions of California including the Sierra Nevada mountains and northern California (See Figure 2).

In the 1920s, wolves were collected for museums from San Bernardino County and Lassen County. In 1937, the U.S. Forest Service documented gray wolves located within six California National Forests. It determined that gray wolves were present in Lassen National Forest (16 individuals), Tahoe National Forest (4 individuals), Eldorado National Forest (12 individuals),

[3] Young and Goldman (1944) report the appearance of wolves as fairly rare in both California and Nevada based on observations dating back to 1827, about 75 years after Schmidt's early records. This probably already reflects the growing intensity of persecution of wolves by the growing human population. Jameson and Peeters (1988) report that the wolf historically occurred along the eastern edge of the state and in the central valley.

Stanislaus National Forest (6 individuals), Angeles National Forest (5 individuals), and Rogue River National Forest (5 individuals). These accounts indicate that the distribution of gray wolves in California was far greater in extant than is commonly stated.

A more recent review by Geddes-Osborne and Margolin (2001) strongly supports studies that indicate wolves were widespread throughout California prior to the time of the first European exploration in 1769. Anthropological studies of indigenous groups in California, both extant and extinct, show that the wolf had a central place in the languages, artwork, ceremonial clothing and belief systems of many tribes. The most persuasive evidence of extensive pre-European wolf presence is found in the 80-plus languages spoken in California before Europeans arrived—most of them had specific words for "wolf."

B. Current distribution and abundance

As of the filing of this petition, the current number of documented gray wolves in California is one male wolf, OR-7, which dispersed from a pack in Oregon. However, since 2009, two wolf packs have been living in northeastern Oregon and in 2011, two more packs were documented. The Oregon Department of Fish and Wildlife has not placed radio-collars on all juvenile wolves from these four packs (ODFW 2011); in fact only six collared wolves are currently trackable. Several un-collared wolves from Oregon packs have unknown fates. Likewise, in Washington State there are currently 27 confirmed wolves. However, not every wolf in Washington is being tracked with a radio collar. Therefore, it is impossible to rule out the possibility that previous dispersal events to California may not have occurred, which simply went un-detected because it is difficult to locate and track dispersing individual wolves (USFWS et al. 2011). Given the long distances that individual wolves can travel, it is possible that some of these individuals have dispersed to remote areas along the California-Oregon border. Currently, neither the California Department of Fish and Game nor the U.S. Forest Service in California conducts regular surveys to determine whether wolves are present within the state.

Historic abundance of wolves is difficult to determine given the lack of documentation. Gray wolves originally inhabited most of North America, and based an analysis of historic wolf genetic diversity utilizing museum specimens, Leonard et al. (2005) estimated that the population of wolves in the western U.S. and Mexico likely numbered 380,000 wolves, with a 95 percent confidence interval of 290,000–560,000 wolves. Recent studies have shown that large areas of suitable habitat still exist in California for wolves. Carroll et al. (2001, 2006) determined that if gray wolves successfully disperse to the southern Cascades and Modoc Plateau, that region would be able to support between 90-470 wolves (See Figure 3). The northern California coast and the Sierra Nevada could also likely support wolf populations.

Given the State-level protections for wolves in Oregon and Washington and the population targets that wolves must attain in each state before any downlisting or removing of State-level protections, wolf populations in Oregon and Washington will continue to grow in the coming years. Packs within these two States will continue to generate individual dispersing wolves, some of which will arrive in California. This makes it likely that a breeding pack will become established within California in the near future.

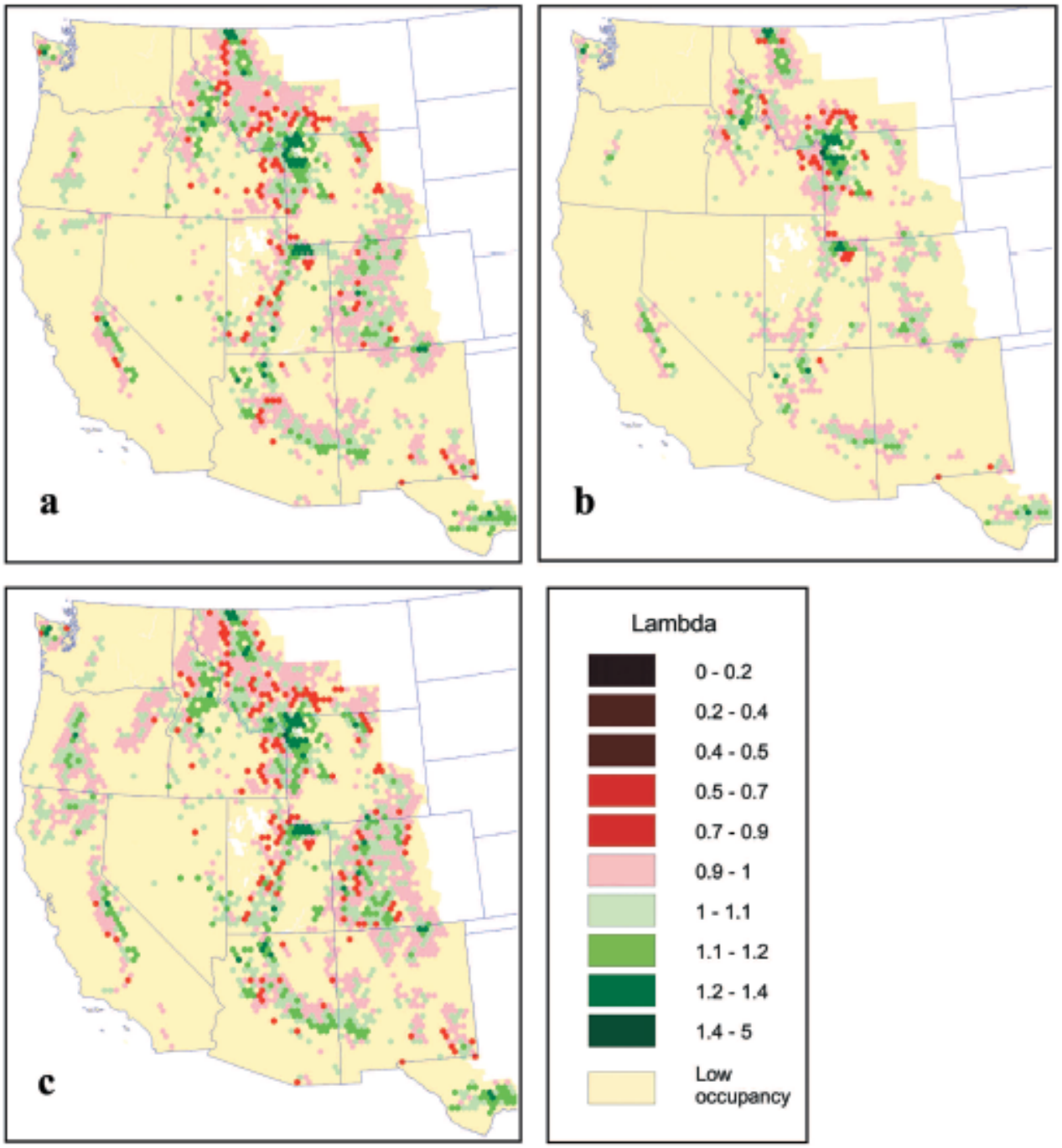

Figure 2. Map of suitable habitat under three scenarios from Carroll et al. (2006). Landscape scenarios are as follows: (a) current conditions; (b) future conditions, with human population as of 2025, with increased road development on both private and unprotected public lands; and (c) current conditions, with human population as of 2000, with restoration (reduction in roads) on public lands.

IV. NATURE, DEGREE AND IMMEDIACY OF THREAT TO GRAY WOLVES IN CALIFORNIA

The primary determinant of the long-term viability of gray wolf populations in California will be human attitudes toward this species. Human attitudes may be based upon perceived or actual conflict between human activities and wolves, concern with the perceived danger the species may pose to humans, its symbolic representation of wilderness, the economic effect of livestock losses, and the wolf traditions of Native American Tribes. Any successful recovery effort in California will require the establishment of policy mechanisms that address livestock losses and any adverse impacts on recreational activities. Educational outreach on the positive impacts that wolves can provide, both to ecosystems and to local economies through ecotourism opportunities, will be essential to any recovery effort in the state.

A. The destruction, modification and curtailment of gray wolf habitat

Although wolves are not dependant on a particular habitat type, scientists have identified a number of habitat or landscape features that influence wolf use and persistence, including human density, density of agricultural lands, and road density, all of which are largely surrogates for the likelihood that wolves will be killed or harmed by people (Mladenoff et al. 1995; 1997, 1999, Carroll et al. 2001, Potvin et al. 2005, Carroll et al. 2006, Mladenoff et al. 2009). Humans harm wolves through disturbance at sensitive den and rendezvous sites, vehicle strikes, hunting and trapping, illegally killing, depredation control, spread of disease from domestic dogs and more. Because of a combination of urban and agricultural development, extensive areas of California are no longer suitable for wolves (Carroll et al. 2001, Carroll et al. 2006). Continued development of natural areas and habitat fragmentation poses an increasing threat to the survival and recovery of wolves in California.

Population growth has been dramatic in California and is predicted to continue. According to the U.S. Census Bureau, the human population of California increased from 1,485,053 in 1900, to 15,717,204 in 1960, to 29,760,021 in 1990, and to 37,691,912 in 2011 with the population expected to increase to 46,444,861 in 2030 (http://quickfacts.census.gov/qfd/states/06000.html). Concordant with this dramatic increase in population extensive urban and agricultural development has occupied nearly all of the Central Valley and coastal areas in California, making these areas inhospitable for wolves (Carroll et al. 2001, Carroll et al. 2006).

Population growth and development has not just been limited to low lying areas, but also continues to impact areas where wolves could still survive and recover in California. The human population of the Sierra Nevada, for example, doubled from 1970 to 1990 and is approximately four times the peak populations of the gold rush (1849-1852) (Duane 1996a). In the Sierra Nevada, a total of 25,000 miles of road have been constructed on public lands alone, including four major highways that cross the range (USDA 2001). Development in both the Sierra Nevada and northern California, the areas most suitable for wolves, is resulting in continued loss of habitat for wolves (Waddell and Bassett 1996, 1997)(Table 1).

Table 1. Conversion of forest habitat to roads, and agricultural and urban development on private lands in California.

Area	Acres of forest converted to:			Total (acres)	Period	Source
	Roads	Agriculture	Urban			
Northern and central Sierra	7,000			7,000	1984-1994	Waddell and Bassett 1997
N. Coast California	17,000	9,000	21,000	47,000	1984-1994	Waddell and Bassett 1996
N. Interior California	8,000			8,000	1984-1994	Waddell and Bassett 1997

Clearly, wolves are threatened by the present or threatened destruction, modification or curtailment of habitat or range and needs the protection of the California Endangered Species Act to survive and recover.

B. Overutilization for commercial, recreational, scientific, or educational purposes

Between their listing under the federal ESA in 1978 and 2009, no gray wolves were legally killed or removed from the wild for either commercial or recreational purposes. In 2009, the FWS published a final rule delisting the wolf in the Northern Rockies DPS except for the state of Wyoming. Shortly thereafter, Montana and Idaho permitted the first legal hunt of wolves for recreational purposes. During that hunt, 72 wolves were taken in Montana and 185 wolves were taken in Idaho. The FWS is currently developing a rule to delist the Western Great Lakes DPS, which would allow the states of Minnesota, Michigan, and Wisconsin to authorize recreational wolf hunts. The amount of poaching for commercial purposes is unknown but will be totally dependant upon the regulatory status of the gray wolf in each state. The risk of human-caused predation can be substantial (64% - 96% of all mortality among the reestablished wolves in the western U.S.), even while under federal management and protection, (65 Fed. Reg. 43467). The FWS noted in 2000 that in California, "The wolf is not mentioned under any management classification and should wolves make their way into the state there would be no existing management protections."

Illegal commercial trafficking in wolf pelts or wolf parts is believed to be rare. Illegal capture of wolves for commercial breeding purposes, while possible, is also believed to be rare. The large fines and prison sentences provided for by the federal ESA for criminal violations are believed to substantially discourage and minimize the illegal killing of wolves for commercial or recreational purposes. Intentional or incidental killing or capture and permanent confinement of endangered or threatened gray wolves for scientific purposes can only legally occur under permits issued by the FWS under Section 10(a)(1)(A)-(B) of the ESA, under an incidental take statement issued by the FWS as part of a biological opinion evaluating the effects of an action by a Federal agency; or by a state agency operating under a cooperative agreement with the FWS pursuant to Section 6 of the ESA. See 50 CFR 17.21(c)(5). Such removals of wolves from the wild have been very limited and probably comprised an average of fewer than two animals per year since the species was first listed as endangered. The FWS does not believe that wolves have been legally removed from the wild for educational purposes in recent years. Wolves that are

used for such purposes are the captive-reared offspring of wolves that were already in captivity for other reasons (FWS 2000).

C. Disease or predation

Many diseases and parasites are found among Canids. Wolves are susceptible to a number of viral and bacterial diseases, including rabies, canine parvovirus, canine distemper, canine adenovirus (canine hepatitis), canine herpesvirus, and leptospirosis (Kreeger 2003, USFWS et al. 2007, Mech et al. 2008, Almberg et al. 2009, ODFW 2010). Some of these can create significant problems in wolf recovery and require monitoring and appropriate treatment to ensure that they do not spread and impact the entire population. However, while some individuals may die from diseases, they generally are not considered a significant problem to wolf recovery. None of these appear to threaten the long-term population viability of wolves in the northern Rocky Mountain states, although periodic outbreaks of canine distemper have been linked to poor pup survival and population decline in some years (USFWS et al. 2007, 2010, 2011, Almberg et al. 2009). Rabies may limit population growth in some situations (Kreeger 2003). Most wolves in North America have had regular exposure to many of the canine diseases over the years and survive.

Canine parvovirus (CPV), a highly-contagious disease that infects wolves, domestic dogs, foxes, coyotes, skunks and raccoons, is most deadly to pups and yearlings and is suspected to have caused a decline in the wolf population at Isle Royale National Park, Michigan (Kreeger 2003), and in Wisconsin during the early and mid-1980s when its wolf population was less than 30 animals (Wydeven et al. 1995). During that time the Wisconsin wolf population declined or was static, and 75 percent of 32 wolves tested by the same method were positive for CPV. During the following years (1988-96) of population increase in Wisconsin, only 35 percent of the 63 wolves tested positive for CPV (WI DNR 1999). In Minnesota, canine parvovirus limited population growth and expansion of the wolf population through reductions in pup survival (Mech et al. 2008). In a captive colony of Minnesota wolves, pup and yearling mortality from CPV was 92 percent of the animals that showed indications of active CPV infections in 1983 (Mech and Fritts 1987). Today, CPV vaccines are available for domestic dogs.

Sarcoptic mange is caused by a mite infection of the skin. The irritation caused by the feeding and burrowing mites results in scratching and then severe fur loss, which in turn can lead to mortality from exposure during severe winter weather. Between 1991 and 1996, 27 percent of live-trapped Wisconsin wolves exhibited symptoms of mange. During the winter of 1992-93, 58 percent showed symptoms and a concurrent decline in the Wisconsin wolf population was attributed to mange-induced mortality (WI DNR 1999a). During that same period, mange was the third-largest cause of death in Wisconsin wolves, behind trauma (usually vehicle collisions) and shooting (Nancy Thomas 1998). Other diseases and parasites, including, canine heartworm, blastomycosis, brucellosis, bovine tuberculosis, hookworm and coccidiosis have been documented in wild gray wolves, but their impacts on future wild wolf populations are not likely to be significant (Brand et al. 1995, Johnson 1995, Mech and Kurtz 1999, WI DNR 1999b).

Natural Predation

No wild animals habitually prey on wolves. Large prey such as deer, elk, or moose (Mech and Nelson 1989, Smith et al. 2001), or other predators, such as mountain lions (*Felis concolor*) or grizzly bears (*Ursus arctos horribilis*) where they are extant (FWS 2005), occasionally kill wolves, but this has only been rarely documented.

Wolves frequently are killed by other wolves, most commonly when packs encounter and attack a dispersing wolf as an intruder or when two packs encounter each other along a territorial boundary (Mech 1994). But this form of mortality is something with which wolves have evolved and it should not be considered a threat except to the extent that it may be accelerated by loss of suitable habitat or other anthropogenic factors.

Human Predation

Human predation is a primary threat to gray wolves. At the time of the gray wolf's 1978 listing, FWS recognized that "[d]irect killing by man . . . has been the major direct factor in the decline of wolves in the conterminous United States." 43 Fed. Reg. at 9611. Through the enforcement of take prohibitions for gray wolves, the federal ESA has been crucial to allowing progress towards wolf recovery for gray wolves. Yet even with the ESA's protections, human-caused mortality – including vehicle accidents and illegal trapping and shooting – has accounted for a significant number of wolf deaths. In Washington State, for example, as many as five members of the protected Lookout Pack were killed by residents of Twisp, Washington, who were later caught attempting to mail a wolf carcass to Canada.

Within California there is a substantial livestock industry that has historically dealt with predators by lethal control. Government and industry sponsored trapping and hunting of wolves was instrumental in driving the gray wolf towards extirpation in California, and the chief reason that the gray wolf was listed as an endangered species throughout the United States.

Illegal killing of wolves occurs for a number of reasons. Some of these killings are accidental (for example, wolves are hit by vehicles, mistaken for coyotes and shot, or caught in traps set for other animals); some of these accidental killings are reported to authorities. 76 Fed. Reg. at 26117. It is likely that most illegal killings, however, are intentional and are never reported to government authorities. *Id*. Because they generally occur in remote locations and the evidence is easily concealed, there are no reliable estimates of intentional illegal killings. *Id*.

There is no reason to believe that the threat posed by human persecution – the threat that in large part prompted listing of wolves – has been addressed. Researchers who examined over 30 studies of human attitudes towards wolves have concluded that attitudes towards wolves have largely remained stable and some recent research suggests declining attitudes towards wolves in parts of the country (Bruskotter et al. 2010; Nauton-Treves et al. 2003, Treves et al. 2011)

There can be no doubt that human-caused mortality in the form of illegal killings and vehicle strikes is a primary threat to gray wolves in California and in areas that serve as source populations for wolves dispersing back to the state. This threat is likely to increase in California

as human development continues to fragment wolf habitat and in the absence of protection under the California Endangered Species Act and a state recovery plan.

D. The inadequacy of existing regulatory mechanisms

The gray wolf is not currently listed as an endangered or threatened species under the California Endangered Species Act. The gray wolf is also absent from the California list of game animals. (See CA §250–479). As a result, the gray wolf does not fall under any regulatory scheme within the state, despite being a species that is native to California. Given the possibility that gray wolves are already naturally dispersing to California and have a high potential to do so in the near future, the California Department of Fish & Game must address this anomaly by listing the gray wolf as an endangered species and develop a management scheme for the protection of the gray wolf. Such an action would be consistent with the approach taken by the States of Oregon and Washington, both of which listed the gray wolf at a time when no individuals were presently located within their respective State boundaries.

As wolves have lost Endangered Species Act protection in the Great Lakes and northern Rocky Mountains, most states have enacted fewer restrictions on take of wolves in areas of greater human habitation in an effort to either eliminate or sharply reduce wolves from these areas (See FWS 2011).

Protection under the federal ESA for gray wolves that reach California is not sufficient to ensure their long-term survival in California. FWS has dedicated almost no resources to wolf recovery in California. In particular, the agency has never developed a recovery plan for wolves in the state, meaning there is no prescribed management and no recovery goals for wolves in California. The agency has also recently stated that it is considering removing protections for wolves in the lower 48 states, concluding: "[i]t is likely that revision of the 1978 gray wolf listing into finer-scale taxonomic or population units will result in removal of the Act's protections in areas of the historical *C. lupus* range, such as the Great Plains States and areas of the western States, that do not support extant wolf populations *and* do not play a role in the recovery of any of the four gray wolf entities." 76 Fed. Reg. 26,086. In this proposal, FWS did state their intention to consider protecting a Pacific Northwest distinct population segment that included California, but there is no guarantee that the agency will in fact protect such a population.

Given the continued threats of habitat loss and fragmentation and human persecution and predation, CESA protection is critical for the survival and recovery of gray wolves in California. Sound management at the State level through a science-based recovery plan will ensure that wolf-livestock conflicts are minimized and that wolf recovery is done in a manner that reduces conflict. Without an improved legal framework for protecting wolves, it is highly likely that wolves entering California will be at high risk of being killed by humans.

V. RECOMMENDED MANAGEMENT AND RECOVERY ACTIONS

1. List the gray wolf as an endangered species within California under the California Endangered Species Act.
2. Initiate a long-term planning process to create a science-based wolf recovery plan that provides for wolf recovery in areas of suitable habitat. Such a plan should include the development of clear conservation goals for the recovery of gray wolves.
3. Initiate a planning process with local land owners and county and local officials to proactively address potential human-wolf conflicts. Such a process should include development of financial measures to compensate for wolf-related mortalities to livestock and other human property, the development of protocols to non-lethally manage wolves within California, with lethal removal where non-lethal management has been proven ineffective, as a last resort.
4. Identify and resolve barriers to gray wolf dispersal such as highways and urban developments. Provide a means whereby gray wolves can traverse barriers (i.e., bridges and vegetated overpasses over and under high-traffic roads) to connect areas of suitable habitat.
5. If no breeding pairs of wolves have become established within California by 2017, initiate a planning process to translocate wolves from locations outside of California to facilitate the establishment of wolves within the state.

VI. CONCLUSION

In the 1920a, after decades of heavy persecution, the gray wolf was extirpated from California. However, recent events have shown that gray wolves are beginning the re-colonization process in California. OR-7 has demonstrated that wolves can still move quickly across the landscape and that suitable habitat still exists in California. Wolves are highly adaptable and have the ability to thrive in myriad geographical and climatic conditions throughout California so long as the proper management structure is in place to accommodate the biological needs of wolves and the needs of society.

Therefore, in recognition of the return of the gray wolf to California, a comprehensive recovery plan must be developed to guide the restoration of this species in the State. A critical first step in this process to developing a management is to list the gray wolf as an endangered species under the California Endangered Species Act. For the reasons described above, the gray wolf must be listed under the California Endangered Species Act.

Respectfully submitted for all petitioners,

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