

Petition to Maintain Protections for Gray
Wolves (*Canis lupus*) in the Lower 48 States
as Endangered or Threatened
“Distinct Population Segments”
Under the Endangered Species Act

December 17, 2018



Authored By:

Center for Biological Diversity
The Humane Society of the United States

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David Bernhardt, Deputy Secretary of the Interior
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240
exsec@ios.doi.gov

Margaret Everson, Principal Deputy Director
U.S. Fish and Wildlife Service
1849 C Street NW
Washington, DC 20240
Margaret_Everson@fws.gov

Dear Deputy Secretary Bernhardt and Principal Deputy Director Everson:

Pursuant to 16 U.S.C. § 1533(b)(3) of the Endangered Species Act (“ESA”) and its implementing regulations, 50 C.F.R. § 424.14, as well as section 5 U.S.C. § 553 of the Administrative Procedure Act (“APA”), the Center for Biological Diversity and The Humane Society of the United States hereby petition the U.S. Department of the Interior (“DOI”), and the U.S. Fish and Wildlife Service (“Service” or “FWS”), to change the existing listing for the gray wolf (*Canis lupus*), excluding the Mexican wolf subspecies (*Canis lupus baileyi*),¹ into one or several “distinct population segments” (“DPSs”) that encompass the entire range of the gray wolf in the conterminous U.S. This petition requests one of three alternative DPS designations: 1) a DPS for the entire lower 48 States; 2) “Western” and “Eastern” DPSs; or 3) regional DPSs for the West Coast, Southern Rocky Mountains, Northern Rocky Mountains, Northeast, and Midwest. Such biologically-sound DPSs should be assigned ESA listing statuses according to the best available science, as described in this petition.

Gray wolves warrant continued protections under the ESA because, although wolves have made progress toward recovery in some areas, wolves are absent or at risk in numerous significant portions of the range in the lower 48 states, including the northeastern U.S., Southern Rocky Mountains and the West Coast. Numerous threats remain within and outside of the areas currently occupied by wolves such as exploitation, inadequate regulatory mechanisms and disease.

This petition makes clear that there are multiple scientifically and legally justifiable methods to remedying the current patchwork of wolf listings across the lower 48 states. A threatened listing of one or more DPSs would preserve federal oversight to ensure full recovery of the species, as the ESA requires, while providing the Service with the regulatory flexibility under Section 4(d) to work with states to manage conflicts with wolves, including limited

¹ This petition excludes Mexican wolves based on the Service’s finalized listing of the Mexican wolf as a separate endangered subspecies. 80 Fed. Reg. 2488-01 (Jan. 16, 2015). This petition also excludes red wolves (*Canis rufus*), listed as a separate endangered species with experimental populations. 50 C.F.R. §§ 17.11, 17.84(c)(9).

“taking” of wolves if consistent with the overarching conservation goals of the ESA and based on best available science. 16 U.S.C. § 1533(d).

Highly intelligent and social, wolves are family-oriented animals that pair for life and raise their pups using extended family groups. Gray wolves counteract the harms from overpopulation of prey species to ecosystems; they select for diseased animals, including those with chronic wasting disease, and wolves moderate their mesopredators, particularly coyotes. Because of their important top-down work, wolves are one of our nation’s most powerful and important protectors of biodiversity in the environments where their populations reach ecologically-effective levels.

We are at a crossroads with wolves. Rather than once again resort to harmful exploitation and needless persecution, the Service must commit to recover this species in the lower 48 states. Recognizing the incalculable value of having wolves on the landscape, we can promote coexistence by responsibly addressing conflicts while fully rejecting unfounded antipathies.

It is crucial to the long-term and sustainable recovery of gray wolves, and to the integrity of the ESA and our nation’s interests in protecting against loss of vulnerable species, that the Service shows leadership on this issue and demonstrates that an administrative path forward to recovery of wolves exists. The undersigned believe that this petition provides a platform for that action.²

Sincerely,



Collette Adkins, Senior Attorney
Center for Biological Diversity

and



Anna Frostic
Managing Attorney, Wildlife & Animal Research
The Humane Society of the United States

On Behalf of the Petitioners

² This petition represents an independent regulatory action under Section 4(b)(3) of the Endangered Species Act, and the Service should therefore respond to the maximum extent practicable within 90 days of receipt of this petition. 16 U.S.C. § 1533(b)(3). Pursuant to 50 C.F.R. § 424.14, notice was provided to relevant states on October 29, 2018.

LEGAL AND FACTUAL BACKGROUND

I. The Endangered Species Act

The ESA is “the most comprehensive legislation for the preservation of endangered species ever enacted by any nation” in the world. *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 180 (1978). Congress enacted the ESA in 1973 “to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, [and] to provide a program for the conservation of such endangered species and threatened species” 16 U.S.C. § 1531(b).

The ESA defines an “endangered species” as one “which is in danger of extinction throughout all or a significant portion of its range.” *Id.* § 1532(6). A “threatened species” is “any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” *Id.* § 1532(20).

For any species listed as endangered, Section 9 of the ESA makes it unlawful for any person to, among other activities, “import any such species into, or export any such species from the United States,” or to “take any such species within the United States.” *Id.* § 1538(a)(1)(A), (B). The term “take” includes “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” *Id.* § 1532(19).

For species that are listed as threatened, rather than endangered, the Service “may,” but is not required to, extend the prohibitions of Section 9 to the species. *Id.* § 1533(d). However, for threatened species the ESA nonetheless *requires* the Service to “issue such regulations as [it] deems necessary and advisable to provide for the conservation of such species.” *Id.* § 1533(d) (noting that “the Secretary *shall* issue such regulations” (emphasis added)).

The term “conservation” is specifically defined in the ESA as “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.” *Id.* § 1532(3). The statutory definition of “conservation” further provides that “[s]uch methods and procedures include, but are not limited to, all activities associated with scientific resources management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping and transplantation, and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regulated taking.” *Id.*

The ESA provides for the listing of DPSs of vertebrate species. The Service will consider a population a DPS if it is “discrete” in relation to the remainder of the species to which it belongs and “significant” to the species to which it belongs. Policy Regarding the Recognition of Distinct Vertebrate Segments Under the Endangered Species Act (“DPS Policy”), 61 Fed. Reg. 4722, 4725 (Feb. 7, 1996).

II. The U.S. Government Persecuted and Then Protected Gray Wolves

The gray wolf once occupied the majority of North America, excluding perhaps only the driest deserts and the southeastern U.S. where the red wolf occurred. *See* 78 Fed. Reg. 35,664 (June 13, 2013). Scientists estimate that pre-European settlement as many as 2 million wolves may have lived in North America (Leonard et al. 2005).

The expanding American frontier was characterized by unrestrained hunting, including market hunting, leading to the decimation of ungulate populations on which wolves depended. In turn, wolves preyed extensively on newly present livestock which were ubiquitous on the frontier. In response, during the 19th and early 20th centuries, livestock associations, counties and states offered bounties to incentivize the killing of wolves, but with limited success. To complete wolf extermination, beginning in 1915, the U.S. Bureau of Biological Survey (predecessor of the Service) hired hundreds of trappers and poisoners, each assigned to a district, to ensure that wolves as well as other targeted wildlife would find no refuge whatsoever (Robinson 2005).

By 1967, when wolves were first federally protected under a precursor to the Endangered Species Act, they had been reduced to fewer than 1,000 wolves in northeastern Minnesota, with a very small isolated population on Isle Royale. *See* 74 Fed. Reg. 15,069 (April 2, 2009). The Service originally protected wolves as subspecies, but after recognizing the uncertain validity of these subspecific designations,³ the Service in 1978 protected the gray wolf at the single-species level in the conterminous United States as an endangered species and designated the Minnesota population as threatened.⁴

Despite the wolf's nationwide listing at the species level, the Service did not develop a nationwide gray wolf recovery plan. Instead, the Service developed separate wolf recovery plans for unrecognized entities in three recovery areas: the Northern Rocky Mountains (drafted in 1978, revised in 1987), western Great Lakes (drafted in 1978, revised in 1992 for the "eastern timber wolf") and Southwest (drafted in 1982, revised in 2017 covering what is now separately listed as the Mexican wolf). With protections in place and wolf reintroductions, including in portions of the Northern Rocky Mountains,⁵ wolves began to grow in number and expand their

³ In 1977, the Service determined that the listing of gray wolves by subspecies was "[un]satisfactory because the taxonomy of wolves [was] out of date, wolves may wander outside of recognized subspecific boundaries, and some wolves from unlisted subspecies may occur in certain parts of the lower 48 states." 42 Fed. Reg. 29,527 (June 9, 1977). The Service concluded that the species-level listing was appropriate because the gray wolf "formerly occurred in most of the conterminous United States and Mexico . . . [and because] of widespread habitat destruction and human persecution, the species now occupies only a small part of its original range in these regions." *Id.*

⁴ 43 Fed. Reg. 9607 (Mar. 9, 1978). Because the authority to list species as "distinct population segments" did not exist at the time of this action, the basis for the original split-species classification has remained unclear.

⁵ In 1994, the Service designated the Yellowstone Experimental Population Area, 59 Fed. Reg. 60,252 (Nov. 22, 1994), and the Central Idaho Experimental Population Area, 59 Fed. Reg.

range in areas covered by the recovery plans. Wolf expansion has promoted biodiversity and overall ecosystem health in these regions, as explained below (Chadwick 2010).

III. The Service's Efforts to Reduce and Remove Federal Wolf Protections

Beginning in 2000, the Service began biologically-premature efforts to reduce federal protections for wolves under the ESA. 65 Fed. Reg. 43,450 (July 13, 2000) (proposed rule); 68 Fed. Reg. 15,804 (Apr. 1, 2003) (final rule). The Service's 2003 rule divided the endangered gray wolf species into two large DPSs, namely, an Eastern DPS and a Western DPS, which the Service downlisted to threatened status. 68 Fed. Reg. 15,804. The Southwestern DPS, occupied by Mexican wolves, continued to be classified as endangered. *Id.*⁶

The 2003 rule was challenged by conservation and animal protection groups in two Federal district courts, one in Oregon and one in Vermont, both of which rejected the rule and issued orders vacating it. *Defenders of Wildlife v. Sec'y, U.S. Dep't of the Interior*, 354 F. Supp. 2d 1156 (D. Or. 2005); *Nat'l Wildlife Fed'n v. Norton*, 386 F. Supp. 2d 553 (D. Vt. 2005). The courts rejected the Service's focus on the few areas where wolves had made progress toward recovery while ignoring lost historical range. *Defenders of Wildlife*, 354 F. Supp. 2d at 1168-69; *Nat'l Wildlife Fed'n*, 386 F. Supp. 2d at 566.

Instead of taking a broader view of wolf recovery, the Service's response to these judicial rebukes was to take an even more piecemeal approach. Beginning in 2006, the Service attempted to delist wolves by drawing narrower DPS boundaries around occupied areas than the DPSs established in the Service's previously rejected 2003 rule. 72 Fed. Reg. 6052 (Feb. 8, 2007) (2007 Great Lakes delisting rule); 73 Fed. Reg. 10,514 (Feb. 27, 2008) (2008 Northern Rockies delisting rule); 74 Fed. Reg. 15,070 (Apr. 2, 2009) (2009 Great Lakes delisting rule); 74 Fed. Reg. 15,123 (Apr. 2, 2009) (2009 Northern Rockies delisting rule); 76 Fed. Reg. 81,666 (Dec. 28, 2011) (2011 Great Lakes delisting rule).

A series of federal court decisions rejected each of these attempts, and, although the court rulings addressed numerous different legal issues, all touched on a continuing problem—the Service has persistently relied on the progress toward recovery achieved in a fraction of the wolf's range to justify ignoring the continuing need to address remaining threats and potential for further recovery. *Humane Society v. Zinke*, 865 F.3d 585, 605 (D.C. Cir. 2017) (“We hold that the Service's analysis of the status of the Western Great Lakes segment within its current range

60,266 (Nov. 22, 1994), to facilitate reintroduction of “nonessential experimental populations” of gray wolves under Section 10(j) of the ESA. *See* 16 U.S.C. 1539(j). The Service introduced more than 60 wolves to these areas between 1995 and 1996.

⁶ In a region comprised of sixteen southeastern states, the Service delisted wolves, not based on a finding of recovery or extirpation in the region, but instead based on a determination that wolves did not historically exist in that region and thus the 1978 decision to list wolves in that region was erroneous. 68 Fed. Reg. 15,804. In addition, the Service simultaneously enacted Section 4(d) regulations for the two population segments downlisted to threatened status. *Id.* The 4(d) rules were substantially similar to the 4(d) rule promulgated for wolves in Minnesota, 50 C.F.R. § 17.40(d), and these rules applied to most, but not all, of the new Eastern and Western DPSs. 68 Fed. Reg. 15,804.

wrongly omitted all consideration of lost historical range.”); *Humane Society of the U.S. v. Jewell*, 76 F. Supp. 3d 69, 119 (D.D.C. 2014) (“Instead of considering the status of the listed entity, the *Canis lupus* species, as a whole, the Final Rule purposely avoids a comprehensive evaluation of this endangered species throughout its historical range, focusing solely on the viability of a single population of gray wolves in only a part of that range.”); see also *Defenders of Wildlife v. Hall*, 565 F. Supp. 2d 1160 (D. Mont. 2008); *Humane Society of U.S. v. Kempthorne (I)*, 579 F. Supp. 2d 7 (D.D.C. 2008); *Humane Soc’y of the United States v. Kempthorne (II)*, Stipulated Settlement Agreement and Order, Civ. No. 09-01092-PLF, Dkt. 27 (D.D.C., J. Friedman, July 2, 2009); *Defenders of Wildlife v. Salazar*, 729 F. Supp. 2d 1207, 1228 (D. Mont. 2010); *Defenders of Wildlife v. Jewell*, 68 F. Supp. 3d 193 (D.D.C. 2014).

One of the court decisions, the 2010 decision reinstating protections for wolves in the Northern Rocky Mountains, was reversed by Congress. In 2011, Congress passed and the President signed into law an appropriations bill that included a rider directing the Service to reissue the vacated 2009 Northern Rockies delisting rule. See Section 1713, Pub. L. 112-10, 125 Stat. 38 (Apr. 15, 2011). Accordingly, the Service issued another rule removing ESA protections for the gray wolf population in the Northern Rockies (excluding Wyoming). 76 Fed. Reg. 25,590 (May 5, 2011) (2011 Northern Rockies Delisting Rule). In Wyoming, the Service issued a delisting rule, 77 Fed. Reg. 55,530 (Sept. 10, 2012), which the district court vacated and the appellate court reinstated. *Defenders of Wildlife v. Zinke*, 849 F.3d 1077, 1081 (D.C. Cir. 2017).

Thereafter, in 2013, the Service proposed the removal of federal wolf protections across the lower 48 states, except for Mexican wolves, which the Service had separately stated it would conserve at the subspecies level. 78 Fed. Reg. 35,664 (June 13, 2013). But the Service did not move forward with this nationwide delisting proposal, likely given the dissent of scientists who disagreed with its taxonomic conclusions, as explained below, and because the court reinstated protections for wolves in the western Great Lakes. *Humane Society v. Zinke*, 865 F.3d 585, 605 (D.C. Cir. 2017).

In summary, after multiple rounds of litigation over almost two decades in which the courts repeatedly found the Service violated the law and failed to apply the best science, wolves across the lower 48 states remain protected as endangered except for wolves in Minnesota that remain listed as threatened and the delisted wolves in the Northern Rocky Mountains.

IV. Wolf Behavior and Ecology

Gray wolves are territorial and social animals that exhibit group hunting and opportunistic scavenging behavior, normally living in packs of 7 or fewer animals (Mech 1970; Mech and Boitani 2003; Stahler et al. 2006; Vucetich et al. 2012). Typically, only the top-ranking female and male wolves in each pack will breed and reproduce (Mech and Boitani 2003). Wolves are typically but not always monogamous, become fertile as 2-year-olds and usually give birth once each spring to a litter of 2-5 pups, and may continue to produce offspring annually until they are over 10 years old (Mech 1970; Fuller et al. 2003).

Offspring usually remain with their parents for 10 to 54 months, meaning that packs may include the offspring from up to 4 breeding seasons (Mech and Boitani 2003). Crucial to maintaining the genetic diversity necessary for healthy and sustainable populations, subadult and

adult wolves disperse from their natal packs. These dispersing wolves remain nomadic until they locate members of the opposite sex and move to suitable unoccupied habitats to establish new packs and claim new territories (Mech 1970; Mech and Boitani 2003).

Wolves establish home territories through urinary scent marking and howling, and by defending their territories from other wolves. Packs typically occupy and defend a territory of 33 to more than 2,600 square kilometers, with territories tending to be smaller at lower latitudes (Mech and Boitani 2003; Fuller et al. 2003). A wolf pack will generally maintain its territory, even as individual wolves occasionally disperse to form new packs, if the breeding pair is not killed (Mech and Boitani 2003). However, if one or both members of the breeding pair are killed, the remaining members of the pack may disperse, starve, or remain in the territory until an unrelated dispersing wolf arrives and mates with one of the remaining pack members to begin a new pack (Mech and Boitani 2003; Brainerd et al. 2008).

Wolf populations are self-regulating—their populations are generally limited by prey availability, but when prey availability is unusually high wolf populations are limited by density-dependent factors, such as disease, and pack stability and territoriality (Carriappa et al. 2011; Hatton et al. 2015; Lake et al. 2015).

Within the United States, studies of gray wolves in Yellowstone National Park and elsewhere demonstrate that wolves significantly shape their ecosystems, promoting biodiversity and overall ecosystem health. Wolves act as a buffer to the effects of climate change by creating more carrion for scavengers and making it available year-round, to the advantage of bald and golden eagles, brown bears, ravens, magpies, and coyotes (Wilmers and Getz 2005, Stahler et al. 2006, Constible et al. 2008).

Prey animals modify their behavior, distribution and movements in response to wolves (Ripple and Beschta 2004; White and Garrott 2005). By example, gray wolves limit overgrazing of saplings by elk in sensitive riparian environments and thereby permit other species, such as bison, beavers, birds, fish and amphibians to thrive by stabilizing riparian areas (Ripple and Beschta 2003; Chadwick 2010). Native carnivores hold prey numbers at lower levels so that they do not irrupt and then subsequently die from starvation, weather or other stochastic events (Vucetich et al. 2005; Wright et al. 2006; Mitchell et al. 2015).

Wolves also have a controlling effect on other predator species, such as coyotes (Bergstrom 2017, Lennox et al. 2018), which indirectly benefits pronghorn and lynx (Berger and Gese 2007; Smith et al. 2003; Berger et al. 2008; Ripple et al. 2011). The trophic cascade of benefits provided by wolves is extraordinary, producing measurable positive effects for riparian vitality, aspen recruitment -- even down to the microbes in soil (Wilmers et al. 2005; Chadwick 2010; Estes et al. 2011; Ripple et al. 2014; Darimont et al. 2015; Boyce 2018). In short, wolves make ecosystems biologically richer and more functional.

V. Wolf Taxonomy

Numerous efforts have been made to taxonomically classify wolves in North America (e.g. Young and Goldman 1944; Hall 1959, 1981). Nowak (1995) consolidated the gray wolf into five subspecies: the arctic wolf (*C. l. arctos*); the northern timber wolf (*C. l. occidentalis*); the

plains wolf (*C. l. nubilus*); the eastern gray wolf (*C. l. lycaon*); and the Mexican gray wolf (*C. l. baileyi*). The results of mitochondrial DNA testing of historic and modern specimens suggest much greater genetic diversity for historic as opposed to contemporary wolf populations, as the genetic makeup of historic populations was apparently distinctly different from today's populations in some parts of the range (Leonard et al. 2005; Leonard and Wayne 2008a, 2008b; Tomiya and Meachen 2018). Some recent studies do not find support for several of the subspecies identified by Nowak (1995), but continuing support exists for recognition of the separate Mexican wolf subspecies (*C. l. baileyi*) (Leonard et al. 2005).

Some studies have concluded that the eastern wolf (*Canis lycaon*) is a separate species (see, e.g., Wilson et al. 2000, Fain et al. 2010), but a number of other studies have questioned this designation or do not come to the same conclusion (see, e.g., Lehman et al. 1991; Nowak 2003, 2009; Leonard and Wayne 2008a, 2008b; Koblmuller et al. 2009; vonHoldt et al. 2011; see also Randi 2007).

In its June 2013 proposed rule to delist wolves throughout the currently listed range, 78 Fed. Reg. 35,664, the Service referenced upwards of fifty research articles that relate to wolf taxonomy. Nevertheless, the Service based its argument for delisting almost exclusively on a publication by Chambers et al. (2012), which was authored by four employees of the Service, and published in a journal administered by the Service. The Chambers report reviewed other literature and concluded that there are two major clades of wolves in North America, one being the western gray wolf (*C. lupus spp.*) and the other the eastern gray wolf (*C. lycaon*), in addition to the separately recognized red wolf species (*C. rufus*).⁷

Many scientists—including renowned wolf biologists—questioned the Service's conclusion as to species status for *C. lycaon*, and the Service's conclusion as to the historic range of *C. lupus*. In 2013, a group of 16 experts in carnivore taxonomy and conservation biology, representing many of the researchers whose work was referenced in the Service's proposed delisting rule, wrote a letter to the Service stating that “[t]here is not sufficient information to support recognition of a new species of wolf, *C. lycaon*, and the geographic range reduction for *Canis lupus* in the eastern US as currently proposed.”⁸ The American Society of Mammologists also wrote to the Service in 2013 to state its position that “[t]he taxonomic status of gray wolves in Eastern North America is far from settled,” and to question the Service's plan to “draw[] a taxonomic conclusion with crucial conservation implications based on a single study, not representative of the majority view among wolf taxonomists” (Heske et al. 2013).⁹

⁷ The red wolf (*C. rufus*), which historically occupied the southeastern United States, and now occupies a small portion of North Carolina, has long been recognized as a distinct wolf species and is separately listed as endangered species. 32 Fed. Reg. 4001 (March 11, 1967). This petition does not propose any reconsideration of the listing status of *C. rufus*.

⁸ Available at Federal eRulemaking Portal, Docket No. FWS-HQ-ES-2013-0073-39245 and https://www.biologicaldiversity.org/campaigns/gray_wolves/pdfs/scientists_letter_on_delisting_rule.pdf.

⁹ Available at Federal eRulemaking Portal, Docket No. FWS-HQ-ES-2013-0073-39245. The backlash from the scientific community could not have come as a surprise to the Service. In 2011, the Service expressly acknowledged the limitations of the Chambers report while the

In September 2013, the Service announced that it would seek peer-review of the June 2013 proposed rule, in accordance with the agency's peer review policy. 59 Fed. Reg. 34,270. The peer review process was administered by the National Center for Ecological Analysis and Synthesis, which selected six scientists to conduct an impartial review of the proposed rule. The review panel issued a final peer review report in January 2014 (NCEAS 2014). The peer review report makes clear that the Service's proposed rule was decidedly *not* based on the best available science. Specifically, the report was critical of the way in which the Service manipulated scientific information to defend its declaration that the currently listed *C. lupus* entity is not a valid species under the ESA; that *C. lycaon* should now be considered a separate species of wolf recognized to have historically occupied all or part of 29 eastern states in which *C. lupus* should no longer be recognized; that three subspecies of *C. lupus* (*nubilus*, *occidentalis* and *baileyi*) constitute the taxonomically valid representation of gray wolves in the conterminous United States; and that of these three only the Mexican wolf (*C. l. baileyi*) warrants protection under the ESA (NCEAS 2014).

The taxonomic identity of wolves remains controversial and uncertain (Bruskotter et al. 2014; Mech et al. 2014). Such uncertainty in wolf taxonomy prompted Congress (through the Consolidated Appropriations Act of 2018) to compel the Service to initiate a study through a qualified independent entity to determine whether red wolves are a taxonomically valid species and whether Mexican wolves are a taxonomically valid subspecies. But the Service must make listing decisions under the ESA "solely on the basis of the best scientific and commercial data available." 16 U.S.C. § 1533(b)(1)(A). And by the Service's own admission, "*Canis* taxonomy will continue to be debated for years if not decades to come. . . ." 78 Fed. Reg. 35,670. Absent compelling additional information, the weight of current scientific evidence, strongly indicates that only one species of gray wolf exists in the United States (that includes all the northeastern United States).

JUSTIFICATION FOR CHANGING THE GRAY WOLF LISTING TO ONE OR MULTIPLE "DISTINCT POPULATION SEGMENTS"

I. The Service Should Designate One or More New DPSs That Include All Wolves in the Lower 48 States

This petition demonstrates that the best available science supports establishing new listable entities for the gray wolf using one of the three following scenarios: 1) a "Lower 48 DPS" of the gray wolf; 2) two large "Eastern" and "Western" DPSs; and 3) several regional DPSs that encompass the entire range of the gray wolf in the conterminous U.S., including "West Coast," "Northern Rocky Mountains," "Southern Rocky Mountains," "Midwest," and "Northeast" DPSs, as pictured in **Figure 1**. These scenarios encompass the entire range of the

report was still in preparation: "While Chambers et al. . . . provide a scientific basis for arguing the existence of eastern wolves as a distinct species, this represents neither a scientific consensus nor the majority opinion of researchers on the taxonomy of wolves, as others continue to argue that eastern wolves are forms of gray wolves (Koblmuller et al. 2009; vonHoldt et al. 2011)." 76 Fed Reg. 81669.

gray wolf in the lower 48 states (except for the range of the Mexican wolf because of its separate listing at the subspecific level and for the red wolf because of its separate species listing).

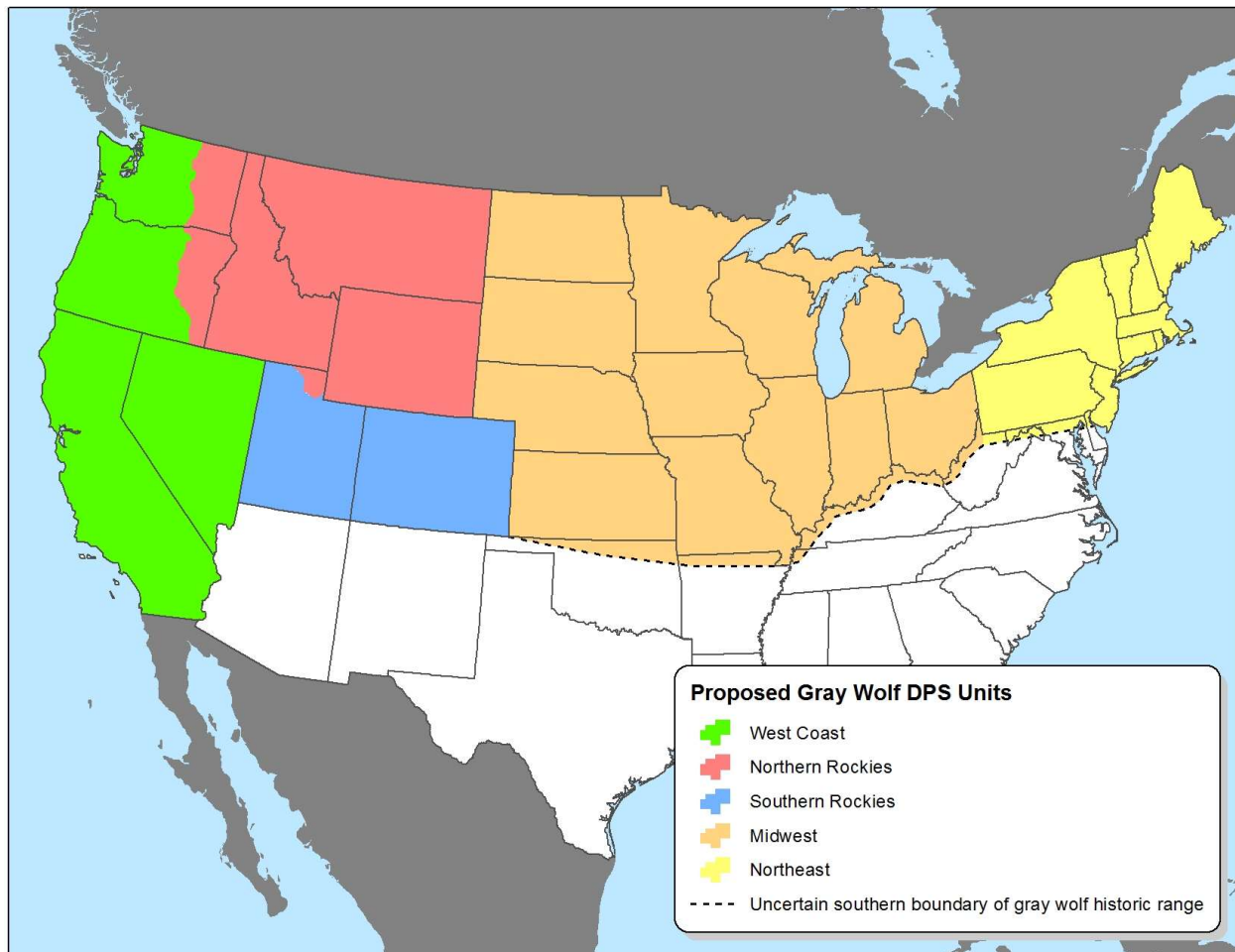


Figure 1. The five regional DPSs addressed in Alternative 3 of this petition.

According to the DPS Policy, a population must be both discrete and significant. 61 Fed. Reg. 4722, 4725. A population is “discrete” if it is “markedly separated from other populations” because of “physical, physiological, ecological, or behavioral factors” or it is “delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant in light of section 4 (a) (1) (D).” *Id.* A population need not have “absolute reproductive isolation” to be recognized as discrete. 61 Fed. Reg. at 4724. The discreteness standard is “simply an attempt to allow an entity given DPS status under the Act to be adequately defined and described,” and the DPS Policy makes clear that it “does not require absolute separation of a DPS from other members of its species.” *Id.* Instead, it “allows for some limited interchange among population segments considered to be discrete.” *Id.* The DPS Policy emphasizes that the test for distinctiveness should not be “unreasonably rigid.” *Id.*

A population is considered “significant” based on, but not limited to, the following factors: 1) “persistence of the discrete population in an unusual or unique ecological setting;” 2) “loss of the discrete population would result in a significant gap in range;” 3) the population

“represents the only surviving natural occurrence of an otherwise widespread population that was introduced;” or 4) the population “differs markedly in its genetic characteristics.” 61 Fed. Reg. at 4725.

The Service’s position has been that the definition of “population” for experimental gray wolf reintroduction rules also should be used for a “distinct population segment.” 78 Fed. Reg. at 35,675. Namely, the Service has defined a wolf population to mean “at least two breeding pairs of gray wolves that each successfully raise at least two young” annually for 2 consecutive years. *Id.* But no court has held that a DPS must have a breeding wolf population before extending protections to individuals that may disperse into the region.¹⁰ In fact, the Vermont court rejected this argument when made by the Service in conjunction with its 2003 Final Rule. *Nat’l Wildlife Fed’n v. Norton*, 386 F. Supp. 2d 553, 565 (D. Vt. 2005) (rejecting Service’s position that “uncertainty over the existence of a population in the Northeast” prohibited DPS designation). As such, the lack of a breeding wolf population does not disqualify an area from designation as a DPS.¹¹

A. The Lower 48 Population of Gray Wolves is a Valid Distinct Population Segment.

Boundaries. The northern boundary of the proposed Lower 48 DPS is the international boundary with Canada. In the east, the Lower 48 DPS is bounded by the Atlantic Ocean and the range of the red wolf. In the west, the Lower 48 DPS is bounded by the Pacific Ocean. In the south, the DPS is bounded by the range of Mexican wolf and the red wolf. This DPS would encompass the entire range of gray wolves in the lower 48 states.

This petition does not geographically delineate the boundaries of the Lower 48 DPS with precision, however, as some scientific uncertainty remains as to the extent of the gray wolf’s range. Gray wolves were likely present in the Appalachian Mountains, and some overlap may exist within the historic ranges of gray wolves (*C. lupus*) and red wolves (*C. rufus*). The Service may permissibly exclude states within the southeastern U.S. if the Service reasonably finds that the gray wolf did not historically occupy those areas; however, it may not exclude states on political grounds.

Discreteness. The DPS Policy allows the Service to use international borders to demonstrate “discreteness” and delineate the boundaries of a DPS, even if the current distribution of the species extends across that border. 61 Fed. Reg. at 4725. Here, the United States-Canada border can be used to mark the northern boundary of the Lower 48 DPS due to the

¹⁰ Courts have upheld that definition only with respect to experimental gray wolf populations. *Wyo. Farm Bureau Fed’n v. Babbitt*, 199 F.3d 1224, 1240 (10th Cir. 2000); *United States v. McKittrick*, 142 F.3d 1170, 1175 (9th Cir. 1998).

¹¹ Nor can the uncertain taxonomic status of wolves in the Northeast disqualify the region from DPS status. Until the best available science indicates otherwise, this region of the country must continue to be included within the listing for gray wolves in the conterminous United States, as discussed above.

difference in exploitation, conservation status and regulatory mechanisms between the two countries. As the Service previously found, wolf populations are generally more numerous and wide-ranging in Canada, not protected by federal laws in Canada and publicly trapped in most Canadian provinces. 68 Fed. Reg. 15,804 (Apr. 1, 2003) (2003 final rule downlisting Eastern and Western DPSs); 76 Fed. Reg. 81,666, 81,672 (Dec. 28, 2011) (2011 Western Great Lakes DPS delisting rule). That same reasoning applies here and demonstrates that the U.S.-Canada border can be used to demonstrate discreteness of the Lower 48 DPS.¹² The Service can find that gray wolves in the conterminous U.S. are “markedly separate” from gray wolves overseas given the Atlantic and Pacific Oceans, of course.

As for discreteness regarding Mexican wolves, the Lower 48 DPS is discrete due to the physiological, ecological, and behavioral factors that prompted the Service to separately list the Mexican wolf subspecies. 80 Fed. Reg. 2488-01 (Jan. 16, 2015). The Service described the best available science on the historical range of the Mexican wolf in the listing rule. 80 Fed. Reg. at 2491. Physical separation exists with Mexican wolves, as gray wolves from populations within the Lower 48 DPS do not regularly disperse into Mexican wolf territory and vice versa. To delineate the southern Lower 48 DPS boundary, Petitioners suggest use of the southern boundary of Utah and Colorado. The Service could also use the northern boundary for the “Southwestern DPS” described in its 2003 Final Rule, namely, Utah north of U.S. Highway 50 and Colorado north of Interstate 70. 68 Fed. Reg. 15,804 (Apr. 1, 2003). Alternatively, the Service might choose to use Interstate 40 in Arizona and New Mexico, as in the Mexican Wolf Special Rule, 50 C.F.R. § 17.84(k)(3).

Significance. The Lower 48 DPS is “significant” based on the following factors: 1) “loss of the discrete population would result in a significant gap in range;” 2) “persistence of the discrete population in an unusual or unique ecological setting;” and 3) the population “differs markedly in its genetic characteristics.” 61 Fed. Reg. at 4725.

Loss of the Lower 48 DPS would result in a significant gap in the range of the gray wolf. Gray wolves once lived throughout most of North America but have been extirpated from most of the southern portions of their historical North American range. As the Service explained when designating a Western Great Lakes DPS of wolves:

The successful restoration of a viable gray wolf metapopulation (a regional group of connected populations of a species) to large parts of Minnesota, Wisconsin, and Michigan has filled a significant gap in the holarctic range of gray wolves in the United States, and it provides an important extension of the range of gray wolves

¹² Differences in laws protecting wildlife and their habitats prompted the Service to use the U.S.-Canada international boundary in several other DPS determinations. 65 Fed. Reg. 16,052, 16,060 (Mar. 24, 2000) (Canada lynx); 69 Fed. Reg. 18,770, 18,769 (Apr. 8, 2004) (Pacific fisher). The Service has also used differences in wildlife abundance to justify use of this international border in other DPS determinations, including for Steller’s eider, peninsular bighorn sheep, and cactus ferruginous pygmy owl. *See, e.g.*, 62 Fed. Reg. 31,748, 31,752 (June 11, 1997) (Alaska DPS of Steller’s eider).

in North America. The loss of the WGL gray wolf population would, therefore, represent a significant gap in the species' holarctic range

76 Fed. Reg. 81,666, 81,672 (Dec. 28, 2011) (2011 Great Lakes delisting rule). Loss of the entire Lower 48 DPS would result in an even more significant gap in the range than loss of wolves in the smaller Western Great Lakes region within it, and therefore, the Lower 48 DPS must be considered significant.

Wolves in the Lower 48 DPS also persist in a unique ecological setting when compared to wolves in Canada and elsewhere. Specifically, the Lower 48 DPS contains a wide variety of cover types and fire regimes that are uncommon elsewhere within the wolf's range, including oak savannas, montane grasslands and more (Snyder 1991; Innes 2010). The ecological role played by wolves varies in extraordinary ways depending on the ecological setting. For example, Wilmers and Schmitz (2016) examined effects of gray wolf-induced trophic cascades on ecosystem carbon cycling and found an increase in net ecosystem productivity in boreal systems but that productivity decreases in grassland systems.

Wolves in the Lower 48 DPS also differ markedly from other wolf populations in genetic characteristics. Although scientists do not agree on the taxonomy of North American wolves, the best available science shows that the Lower 48 DPS includes *C. l. nubilus*, *C. l. occidentalis*, and *C. l. lycaon* (Goldman 1944). The genetic diversity in the Lower 48 DPS is unique, as the conterminous U.S. contains most of the present range of *C. l. lycaon* and may contain unique admixtures of other subspecies as well.¹³ Based on an examination of the limb morphology of the fossil and modern North American gray wolves, Tomiya and Meachen (2018) concluded that protection of the severely diminished *C. l. nubilus* is an essential step toward restoring the ecophenotypic as well as genetic diversity of the species and, with it, its evolutionary potential.

B. In the Alternative, the Service Could Designate Western and Eastern DPSs

The Service could instead designate two large DPSs that comprise the entire gray wolf range in the lower 48 states, namely, "Eastern" and Western" DPSs. We recognize that two courts vacated the 2003 Final Rule that designated such DPSs. *Defenders of Wildlife v. Sec'y, U.S. Dep't of the Interior*, 354 F. Supp. 2d 1156 (D. Or. 2005); *Nat'l Wildlife Fed'n v. Norton*, 386 F. Supp. 2d 553 (D. Vt. 2005). But the Oregon court did not criticize the application of the DPS Policy in designating those DPSs; rather the court rejected the Service's focus on the few areas where wolves had made progress toward recovery while ignoring lost historical range. *Defenders of Wildlife*, 354 F. Supp. 2d at 1172 ("To summarize, FWS created three large DPSs, and downlisted the Eastern and Western DPSs based on the success of the core recovery areas. The Final Rule is arbitrary and capricious because FWS downlisted major geographic areas without assessing the threats to the wolf by applying the statutorily mandated listing factors.").

To be sure, the Vermont court rejected the approach of combining the Northeast and the western Great Lakes into one large Eastern DPS as a misapplication of the DPS Policy. *Nat'l*

¹³ A map of historical and current ranges of gray wolf subspecies can be found here: [https://commons.wikimedia.org/wiki/File:North_American_gray_wolf_subspecies_distribution_according_to_Goldman_\(1944\)_%26_MS3_\(2005\).png](https://commons.wikimedia.org/wiki/File:North_American_gray_wolf_subspecies_distribution_according_to_Goldman_(1944)_%26_MS3_(2005).png).

Wildlife Fed'n, 386 F. Supp. 2d at 564 (“By combining the Northeastern DPS with the Western Great Lakes DPS, two admittedly distinct gray wolf populations, FWS appears to be classifying the gray wolf based upon geography, not biology.”). But the Vermont court’s primary objection was the Service’s myopic focus on the status of the core population in the Western Great Lakes while ignoring lost historical range. *Id.* at 566 (“The Final Rule makes all other portions of the wolf’s historical or current range outside of the core gray wolf populations insignificant and unworthy of stringent protection. The Secretary’s conclusion is contrary to the plain meaning of the ESA phrase ‘significant portion of its range,’ and therefore, is an arbitrary and capricious application of the ESA.”). Petitioners do not object to designation of an Eastern DPS if the Service assesses the impact of lost historical range, including in the northeastern U.S., when determining the status of the DPS.

Boundaries. To establish the boundaries of the Eastern and Western DPSs, the Service could use the approach taken in the 2003 Final Rule. Specifically, the Eastern DPS would include “gray wolves within the States of North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa, Missouri, Wisconsin, Illinois, Michigan, Indiana, Ohio, Pennsylvania, New Jersey, New York, Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire, and Maine.” 68 Fed. Reg. at 15,818. The Western DPS could encompass “States of California, Idaho, Montana, Nevada, Oregon, Washington, Wyoming, Utah north of U.S. Highway 50, and Colorado north of Interstate Highway 70.” *Id.* The Service may exclude states within the southeastern U.S. if it reasonably finds that the gray wolf did not historically occupy those areas; however, it may not exclude states on political grounds.

Discreteness. The proposed Eastern and Western DPSs are discrete for the reasons provided in the 2003 Final Rule. 68 Fed. Reg. at 15,818-19. Specifically, the international boundary with Canada can be used based on the differences in exploitation, regulatory mechanisms and conservation status. And “current gray wolf populations within each of these DPSs are separated from the gray wolf populations in the other DPS by large areas that are not occupied by breeding populations of resident wild gray wolves.” *Id.* at 15,819.

Significance. The proposed Eastern and Western DPSs are also significant for the reasons provided in the 2003 Final Rule. 68 Fed. Reg. at 15,819. The best available science strongly suggests that these DPSs “are separate reservoirs of diversity that differ from each other and therefore are significant to the species.” *Id.* Moreover, loss of either DPS “would clearly produce huge gaps in current gray wolf distribution in the 48 States.” *Id.*

C. In the Alternative, The Service Could Designate Several Regional DPSs

The best available science would also support the Service designating several regional DPSs that comprise the entire range of the currently listed gray wolf entity. Specifically, the Service could designate the following DPSs: West Coast, Southern Rocky Mountains, Northern

Rocky Mountains, Midwest and Northeast. **Figure 1** (above) provides a map with the rough boundaries of the DPSs.

1. Proposed West Coast DPS

Gray wolves previously occupied the Pacific Northwest and California but were presumed extirpated at the time of the passage of the Federal Endangered Species Act of 1973. 77 Fed. Reg. at 35,709-10. With federal protection, wolves began to recolonize the region. 77 Fed. Reg. at 35,710. The current small population of wolves in Oregon, Washington, California and Nevada qualifies as a DPS.

Boundaries. The boundaries of a West Coast DPS would be formed by a combination of non-habitat, the Pacific Ocean, and the international boundary with Canada. In California, Oregon and Washington, the boundaries would consist of the Pacific Ocean to the west and arid and agricultural lands of the Great Basin to the east, ending in the Canadian border to the north. The eastern boundary is delineated by the boundaries established by the Northern Rocky Mountains DPS.

Nevada should be included in this proposed DPS because of the potential for dispersal, as proven by recent observations. One wolf recently dispersed through California almost to Lake Tahoe on the California-Nevada border (Ferreira 2018). Another wolf was spotted in northwest Nevada near Fox Mountain just west of the Black Rock Desert and about 20 miles from the California line (Associated Press 2017). Wolves could also disperse from California to the nearby Humboldt-Toiyabe National Forest in northwestern Nevada.

Discreteness. Habitat modeling by Carroll et al. (2006) shows that substantial areas of non-habitat separate wolf habitat in the Cascades and Sierra Nevada from habitat in the northern Rocky Mountains (see **Figure 2**). Wolves in the Northern Rocky Mountains have crossed this area and indeed have served as a partial source of wolves recolonizing the Cascades. The DPS policy, however, does not require complete reproductive isolation. 61 Fed. Reg. at 4724. And of course, the Service itself designated the Northern Rocky Mountains DPS, even though dispersal into the Pacific Northwest has occurred. 76 Fed. Reg. 25,590 (May 5, 2011). Carroll et al. (2006) identified the “Pacific states” as an area that “could serve as the basis” for a DPS,” and specifically noted that “[e]cological barriers, such as expanses of unsuitable habitat” were an appropriate basis for delineating DPSs. The proposed West Coast DPS is discrete from the proposed Southern Rocky Mountain DPS based on vast non-habitat in eastern Nevada (see **Figure 2**).

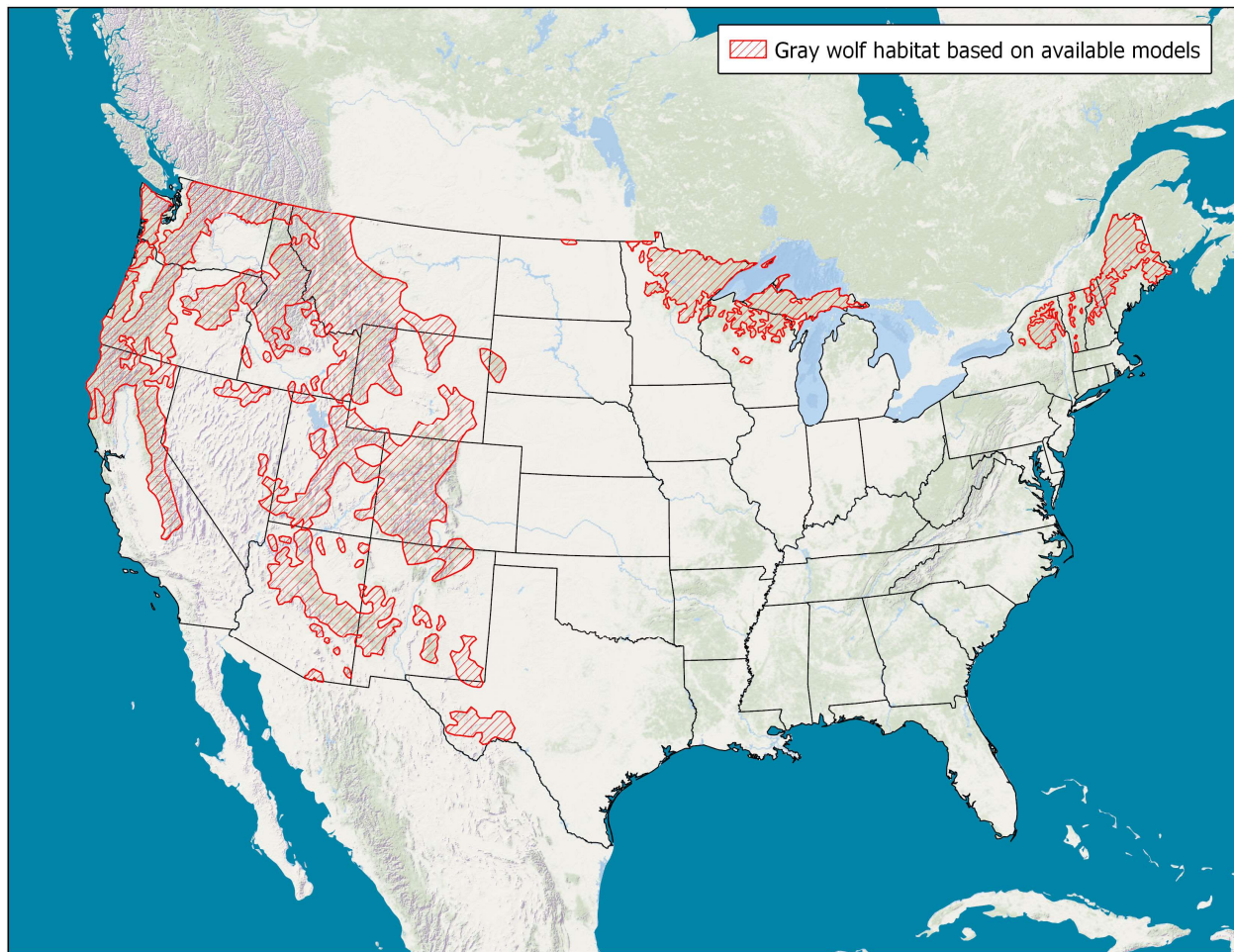


Figure 2. Map of best wolf habitat based on available habitat models. (We have submitted the scientific studies used to develop this map with this petition.) These predictive models include screening parameters such as road density, human population density, prey density, and land cover/use. Wolves could utilize many other areas -- if protected from persecution and with access to adequate prey -- because they are habitat generalists and long-range dispersers (e.g. Mech and Boitani 2003; Jimenez et al. 2017).

Significance. The West Coast DPS of the gray wolf is significant because its loss would result in a significant gap in range, wolves persist in a unique ecological setting there, and existing wolves are markedly genetically different from wolves in the Northern Rocky Mountains and elsewhere.

The Pacific Northwest contains extensive habitat for wolves (Carroll et al. 2006, **Figure 2**; see also WDFW 2011; Weiss et al. 2014; Defenders of Wildlife 2006, 2013; California Dept. of Fish and Wildlife 2016b. Wolf and Ripple 2018). Carroll et al. (2006) identified habitat in the DPS that could support an estimated wolf population of more than 600 wolves. Habitat capable of supporting viable wolf populations was found on the Olympic Peninsula, Oregon Cascades, northern California, and the Sierra Nevada, with the Oregon Cascades providing the largest and most viable core habitat. Olympic National Park has been identified as a large area with suitable wolf habitat and a candidate for wolf reintroduction (Wolf and Ripple 2018). The southern Washington Cascades was not identified by Carroll et al. (2006) as having viable wolf

populations based on current habitat conditions, but a follow-up analysis by Carroll (2007) that also considered habitat in Canada found that the southern Washington Cascades could support a viable population with immigration across the border. The Center for Biological Diversity digitized maps from Carroll et al. (2006) and Carroll (2007) and determined that wolf habitat comprises approximately 280,000 km² (nearly 70 million acres) in Oregon, Washington, California and Nevada. In Oregon, state agency scientists identified suitable habitat totaling 106,853 km² – wolves currently occupy just 12 percent of this area (Oregon Dept. Fish and Wildlife 2015). California Department of Fish and Wildlife identified 60,088 km² (23,200 mi²) in northern California (north of I-80) (CDFW 2016). Given the abundance of suitable habitat in the region, the loss of this habitat would create a significant gap in range for the gray wolf taxon.

The Pacific Northwest also qualifies as a unique ecological setting for wolves. The U.S. Forest Service has created a hierarchical classification system that divides the U.S. into ecoregions based on vegetation and climate with the highest level of classification being domains, followed by divisions and provinces (McNab and Avers 1995). Under this system, the Pacific Northwest has a different domain (humid temperate domain), different divisions (marine and Mediterranean), and different provinces (Cascade Mixed Forest--Coniferous Forest--Alpine Meadow and Sierran Steppe--Mixed Forest--Coniferous Forest--Alpine Meadow Provinces) from any other wolf population in the lower 48 states (*id.*). Overall, differences in vegetation and climate in these areas include dense coniferous forests, abundant precipitation both as rain and snow, and mild temperatures (*id.*). The Pacific Northwest also includes a unique prey base made up of white-tailed deer, mule deer and Roosevelt elk. Wolves in coastal British Columbia tend to be smaller than wolves in the eastern U.S., likely in response to the generally smaller prey base. In addition, coastal wolves of British Columbia feed on fish, an adaption not known from other regions, and such adaptations were likely once common in wolves that roamed the coasts all the way down to California in its former temperate rain forests (Stronen et al. 2014).

Finally, evidence indicates that wolves in the Pacific Northwest differ markedly in their genetic characteristics. vonHoldt et al. (2011) found that wolves in the British Columbia coast formed a distinct genetic grouping, stating: “Other genetic partitions were defined in North America as well, including distinct populations on the British Columbian coast, Northern Quebec, and interior North America.” Recent genetic studies conclude that the Pacific Northwest wolf populations of Washington and Oregon were “likely founded by two phenotypically and genetically distinct wolf ecotypes: Northern Rocky Mountain (NRM) forest and coastal rainforest” (Hendricks et al. 2018). It is likely that genetically-significant wolves from the British Columbia coast will continue to be a source of wolves moving into the West Coast DPS.

2. Proposed Midwest DPS

Boundaries. The Service previously recognized a Western Great Lakes DPS. 76 Fed. Reg. 81,666, 81,672 (Dec. 28, 2011) (2011 Great Lakes delisting rule). Through this petition, we ask the Service to delineate a larger DPS – a “Midwest DPS” – so that the petition’s proposed regional DPSs together comprise the entirety of the range of wolves in the lower 48, as required by law. The western boundary of the Midwest DPS would be the eastern boundary of the Northern Rocky Mountains DPS and the proposed Southern Rocky Mountains DPS. The eastern boundary would be the western boundary of the Northeast DPS, near the Ohio/Pennsylvania border. We do not delineate the southern border of proposed Midwest DPS with precision, as the

Service may exclude states within the southeastern U.S. if the Service reasonably finds that the gray wolf did not historically occupy those areas.

Discreteness. As the Service explained when it previously recognized the Western Great Lakes region as a DPS, it is discrete given the international boundary with Canada and the physical separation from wolf populations in the Northern Rocky Mountains. 76 Fed. Reg. at 81,672.¹⁴ In addition, it is markedly separate from the proposed Northeast DPS by extensive development that creates large swaths of non-habitat near the Ohio/Pennsylvania border.

Significance. The western Great Lakes wolf population – within the proposed Midwest DPS – is the only breeding gray wolf population in the coterminous States east of the Rocky Mountains and currently holds about 70 percent of North American gray wolves known to occur south of Canada. 76 Fed. Reg. at 81,672. As such, as the Service previously recognized, loss of this population would create a significant gap in the wolf's range. *Id.*

3. Proposed Northeast DPS

Boundaries. The western boundary of the Northeast DPS would be the eastern boundary of the Midwest DPS. The northern and eastern boundaries of the Northeast DPS would be the US-Canada border and the Atlantic Ocean, respectively. As indicated above, uncertainty exists as to whether the historic ranges of gray wolves (*C. lupus*) and red wolves (*C. rufus*) overlapped. As such, we do not delineate the southern boundary of the Northeast DPS with precision, as the Service may permissibly exclude states within the southeastern U.S. if the Service reasonably finds that the gray wolf did not historically occupy those areas.

Discreteness. The proposed Northeast DPS is discrete because it is separated from other wolves by the international border with Canada to the north, non-habitat to the west and south created by extensive human development, and the Atlantic Ocean to the east.

Significance. The Northeast contains substantial habitat for wolves and loss of recovery potential for these areas would create a significant gap in range. 20,000 mi² to 25,000 mi² (52,000 to 65,000 km²) of habitat remains in northern New England (Harrison and Chapin 1997, 1998). Mladenoff and Sickley (1998) used logistic regression to model wolf habitat in the Northeast and identified approximately 30,000 mi² (78,000 km²) of habitat from upstate New York to Maine that could support a population of 1,312 wolves (90% CI = 816-1,809) (see also Robinson and Greenwald 2010; Defenders of Wildlife 2006, 2013; Carroll 2003). Indeed, the northeastern U.S. contains tens of thousands of moose, many thousands of beaver and hundreds of thousands of white tailed deer that could sustain a wolf population (Glowa et al. 2009). In addition, several surveys indicate strong public support for wolf restoration in the region (Responsive Management 1996; Downs and Smith 1998).¹⁵

¹⁴ The Western Great Lakes DPS did not extend all the way to the border of the Northern Rocky Mountains, as the proposed Midwest DPS does. This does not defeat “discreteness” of the DPSs, however, because the wolf populations themselves remain markedly separate.

¹⁵ The Service contemplated recovery of wolves to the northeastern U.S. when it developed the 1978 recovery plan for the “eastern timber wolf.” The recovery plan identified several areas

The Northeast DPS is also significant because wolves that would reoccupy it would likely differ markedly in their genetic characteristics. As discussed above in the Wolf Taxonomy section, wolves that historically occupied the region, and currently live across the border in Canada, may differ genetically from wolves elsewhere in the lower 48 states.

The proposed Northeast DPS is also significant because wolves would be important to the ecosystems within it. While ecosystem importance cannot be the sole or primary basis for a finding of significance, it is a factor that should be considered by the agency. 61 Fed. Reg. at 4724. Recent studies provide multiple lines of evidence that wolves play a critical ecological role, controlling ungulate populations and creating trophic cascades with results such as greater species richness of shrubs and forbs (e.g. Callan et al. 2013). The ecosystems of the northeastern U.S. would benefit greatly from wolf restoration. Restoring wolves could complete a broken food chain by providing a natural predator for moose in the northeastern U.S. (Fascione et al. 2001).

4. Proposed Southern Rocky Mountains DPS

Boundaries. The northern boundary of the proposed Southern Rocky Mountains DPS would be the southern boundary of the Northern Rocky Mountains DPS. The eastern boundary of the proposed Southern Rocky Mountains DPS would be the Colorado state line, where it abuts the Midwest DPS. As discussed above, several options exist for the southern boundary, but Petitioners suggest that the Service use the southern state borders of Utah and Colorado. The western boundary would be the western border of Utah.

Discreteness. The proposed Southern Rocky Mountains DPS is discrete because it is separated from wolves in the Northern Rocky Mountains DPS by the Red Desert and dry plains of southwestern and central Wyoming, and by extensive areas of agriculture and human development across southern Idaho. Although wolves have occasionally dispersed from the Northern Rocky Mountains DPS into this region, and could come from the south, the DPS Policy does not require absolute isolation. Moreover, dispersing wolves are key to repopulation of the region.

The proposed Southern Rocky Mountains DPS is also separated from wolves in the proposed West Coast DPS. As explained above, only one wolf has been known to disperse into Nevada in recent years, and that wolf came from California (Associated Press 2017). Any wolves in the proposed Southern Rocky Mountains DPS are separated from wolves in the California portion of the proposed West Coast DPS by vast non-habitat in eastern Nevada.

The proposed Southern Rocky Mountains DPS is discrete from Mexican wolves due to the physiological, ecological, and behavioral factors that prompted the Service to separately list

in the northeastern U.S. as potential wolf habitat, including northwest Maine and the Adirondack Mountains of New York. These areas remained in the recovery plan when it was revised in 1992 but the Service did not actively pursue wolf restoration in the region. Development of a nationwide recovery plan would facilitate wolf recovery in the region.

the Mexican wolf subspecies. 80 Fed. Reg. 2488-01 (Jan. 16, 2015). In addition, physical separation exists with Mexican wolves. The Southern Rocky Mountains DPS is separated from Midwest wolves by vast areas of non-habitat.

Significance. Carroll et al. (2006) identify Colorado as one of the states (along with Montana, Idaho and Wyoming) capable of supporting “the largest potential wolf populations,” and estimate the state could support nearly 1,000 wolves with Utah being able to support more than an additional 600 wolves (see also Bennett 1994; Miller et al. 2003). As such, the proposed DPS can support substantial wolf populations, whose loss would create a significant gap in range.

The Southern Rocky Mountains DPS also qualifies as significant because it has a unique ecological setting for wolves. As explained above in the section on the West Coast DPS, the U.S. Forest Service has created a hierarchical classification system that divides the U.S. into ecoregions based on vegetation and climate (McNab and Avers 1995; McNab et al. 2007). Under this system, the proposed Southern Rocky Mountains DPS includes the Colorado Plateau Semidesert Province, unlike any other proposed DPS or wolf population in the lower 48 states (McNab et al. 2007). In this unique ecological setting, the prey of wolves would differ from wolves in other parts of the lower 48 states. Specifically, wolves in this cold desert region would have heavier reliance on smaller mammals, such as squirrels.

5. Existing Northern Rocky Mountains DPS

The Northern Rocky Mountains DPS would continue to exist as defined by its present boundaries, including the eastern one-third of Washington and Oregon, a small part of north-central Utah, and all of Montana, Idaho, and Wyoming. 74 Fed. Reg. 15,123 (Apr. 2, 2009).

II. Gray Wolves Face Continued Threats to their Survival

While some progress has made to ameliorate threats to the gray wolf since listing, threats remain inadequately addressed in both occupied and unoccupied portions of the range, as explained below. The ESA requires the Service to list based on the following five factors:

- (A) the present or threatened destruction, modification, or curtailment of its habitat or range;
- (B) overutilization for commercial, recreational, scientific, or educational purposes;
- (C) disease or predation;
- (D) the inadequacy of existing regulatory mechanisms; or
- (E) other natural or manmade factors affecting its continued existence.

16 U.S.C. § 1533(a)(1). This is a disjunctive list and if the species is imperiled by any one factor, listing is required. 50 C.F.R. § 424.11(c); *see also Sw. Center for Biological Diversity v. Babbitt*, 215 F.3d 58, 60 (D.C. Cir. 2000).

Although additional threats to wolves exist, the discussion below focuses on the key threats of overutilization, inadequate state regulatory mechanisms, disease, and reduced genetic

diversity. When analyzing the threat of habitat loss, the Service should consider that many formerly ideal areas of wolf habitat have been degraded through roadbuilding and other development (**Figure 2**).

A. Overutilization and Inadequate State Regulatory Mechanisms

Several states have made no secret of their intentions to dramatically reduce wolf numbers and stifle expansion of wolf range. And in most areas, the primary threat to wolf populations is high rates of human-caused mortality (Bruskotter et al. 2014). As such, overutilization and the inadequacy of state regulatory mechanisms in both occupied and unoccupied areas remain current threats to the species' survival.

Recent studies demonstrate that hunting and trapping may have an additive or even super-additive effect on wolf mortality through the additional loss of dependent offspring or by disrupting pack structure (Murray et al. 2010; Creel and Rotella 2010; Ausband et al. 2015; Borg et al. 2015). Brainerd et al. (2008) addressed the issue of breeder loss in wolf packs through an analysis of pooled data, finding among other consequences that the loss of one or more breeders led to dissolution of groups and territory abandonment in 38 percent of cases. Further, Rutledge et al. (2010) concluded that human predation could affect evolutionarily important social patterns in wolves and that intense exploitation appeared to increase the adoption of unrelated wolves into disrupted packs. Hochard and Finnoff (2014) found that the effects of wolf hunting depends in part on the resulting change in wolf pack size. Similarly, Bryan et al. (2014) found that hunting wolves can change their reproductive and breeding strategies as well as create chronic stress for them, with potentially detrimental effects on the fitness of individuals, changes to packs' evolutionary potential, and increased risk for population extinction (see also Rick et al. 2017). Ausband et al. (2017) found that breeder turnover had marked effects on the breeding opportunities of subordinates and the number and sex ratios of subsequent litters of pups. The wolf researchers concluded that seemingly subtle changes to groups, such as the loss of one individual, can greatly affect group composition, genetic content, and short-term population growth when the individual lost is a breeder.

Moreover, several studies have indicated that a wolf population can only be sustained if mortality rates are less than 30 percent, so long as normal pack dynamics have not been altered (Adams et al. 2008; Creel and Rotella 2010; Sparkman et al. 2011; Vucetich 2012). Yet, as explained below, some management plans allow for mortality rates that exceed 30 percent. Indeed, without federal protections for wolves in the conterminous U.S., state management would put wolves at risk of high level of human-caused mortality, which can significantly affect wolf population levels and stymie recovery (Fuller et al. 2003; Creel and Rotella 2010; Creel et al. 2015).

Appendix A includes a table that provides a state-by-state analysis of laws pertaining to wild populations of wolves. (We submitted with this petition the documents used to inform this analysis.) Only eight states protect wolves as a state endangered or threatened species: California, Colorado, Illinois, Nebraska, New Hampshire, New York, Texas, Virginia, and Washington. The majority of states within the lower 48 have no protections in place for gray wolves: Alabama, Arkansas, Arizona (portion outside of Mexican wolf range), Connecticut, Delaware, Florida, Georgia, Indiana, Kentucky, Louisiana, Massachusetts, Maryland, Maine,

Missouri, Mississippi, North Carolina, New Jersey, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Tennessee, Utah, Vermont and West Virginia.¹⁶ Several of these states lack any plans or protections for wolves, even though wolves have dispersed into those states, including Indiana,¹⁷ Kentucky, Massachusetts, Maine, Missouri, Ohio, Utah and Vermont. *See* 78 Fed. Reg. at 35,675 (noting in the 2013 proposed nationwide delisting that wolves have been seen in Missouri and Indiana but no regulatory mechanisms relating to wolves exist in those states).

While some states lack any plan for wolves that enter their borders, other states seek to actively prevent recovery of the species. By example, Utah requires state wildlife officials to capture and kill any wolf that comes into the state to prevent the establishment of a viable wolf pack. Utah Code § 23-29-201. South Dakota in 2013 passed legislation designating wolves in the eastern half of the state as “varmints” that can be shot on sight. S.D. Codified Laws § 41-1-1.

Other states with wolves within their borders have classified wolves as furbearers or game animals and would likely allow regulated hunting and trapping and livestock predation control upon removal of federal protections, including Iowa, Kansas, Michigan, Minnesota, Nevada, North Dakota, Oregon, South Dakota, Washington and Wisconsin.

Regional analyses of state regulatory mechanisms are provided immediately below.

Inadequate State Regulatory Mechanisms in the Pacific Northwest and California.

In Oregon, wolves are no longer protected as a state endangered species. OAR 635-100-0125. State agents kill wolves nearly every year for livestock predation control under the state’s inadequate management plan (Oregon Dept. Fish and Wildlife 2010). While wolves in Oregon are still federally protected in the state’s western two-thirds, the eastern one-third lost federal protection with the Northern Rocky Mountains DPS congressional delisting. The recolonization of wolves in western Oregon has been slow and the killing of wolves in the federally delisted portion must be considered a threat as it hinders the ability of wolves to disperse and repopulate unoccupied areas. Oregon also has experienced high levels of wolf poaching in recent years, particularly in southwestern Oregon as dispersing wolves have tried to reach suitable habitat in the region. Oregon’s current wolf population is estimated at only 124 wolves (Oregon Dept. Fish and Wildlife 2017).

As in Oregon, wolves in the eastern third of Washington lost federal protection with delisting of the Northern Rocky Mountain DPS. Only three of Washington’s packs reside in the portion of the state that currently retains federal protections, while nineteen of its packs inhabit the federally delisted portion (Washington Dept. Fish and Wildlife 2017). Washington wolves remain classified as an endangered species under state law (WAC 220-610-010), but state

¹⁶ Gray wolves are listed as “extirpated” in Kentucky, Maryland, Missouri and Ohio, but it does not appear that this status extends any protections to dispersing wolves.

¹⁷ The Indiana Dept. of Natural Resources states on its webpage that “State law allows a resident landowner or tenant to kill a wolf if it poses a threat to people or while it is causing damage to property owned or leased by the landowner or tenant” (Indiana Dept. of Natural Resources 2018). But the state code and regulations do not appear to provide protection for wolves.

managers nevertheless kill wolves for livestock predation control (Washington Dept. Fish & Wildlife 2011, 2017). Since 2012, state managers have killed more than 20 state-endangered wolves, at least 17 of which were killed for the same livestock operation on public lands grazing allotments. In the process, the state has eliminated four wolf packs, all for the same livestock owner. Washington's current wolf population is estimated at only 122 wolves (*Id.*).

California protects wolves within its borders as endangered (California Dept. of Fish and Wildlife 2016), but wolves still face high risk of human-caused mortality as they can be shot by hunters targeting coyotes, for example, or incidentally injured or killed in lethal traps and snares set for other species. California's first known wolf pack in more than 100 years, the all-black, seven-member Shasta pack, disappeared within a year of the pack's discovery in 2015, following two incidents of conflicts with livestock and openly hostile threats of "shoot, shovel and shut-up" posted on social media (Kearnes 2017; Fimrite 2018). While no direct evidence exists that poachers illegally killed the pack, threats of violence towards wolves in California continue to appear on media outlets. California's current wolf population is around 12, with seven to ten animals comprising its sole existing residential pack, the Lassen pack, and two known dispersing collared Oregon wolves.

Inadequate State Regulatory Mechanisms in the Southern Rockies. The fact that nearly all wolves that have dispersed into the proposed Southern Rocky Mountains DPS have been killed by people shows that they face significant threats. Indeed, Utah passed a law in 2010 that aims to prevent recovery of wolves by requiring state managers to seek immediate removal of any wolves entering the state, Utah Code § 23-29-201, even though nearly three-quarters of Utah residents surveyed have positive attitudes toward wolves (Bruskotter et al. 2007). Arizona has no protections in place for wolves and no plan to aid gray wolf recovery. Only Colorado and New Mexico protect wolves as endangered under state law, but they have no plans to promote recovery. Colorado has a set of recommendations for dealing with wolves that disperse into the state, but that document makes clear that "possibility of recovery and/or reintroduction will be dealt with separately" (Colorado Working Group 2004).

Inadequate State Regulatory Mechanisms in the Midwestern U.S. State management under plans and laws in Minnesota, Wisconsin and Michigan are "inadequate regulatory mechanisms" because they would allow intensive livestock predation control, hunting and trapping. Collectively, the plans in these three states would permit a 50 percent decline in the Great Lakes wolf population. *See* 75 Fed. Reg. 55,734 (summarizing the state plans that provide a minimum population of 1600 in Minnesota, a 350-population target for Wisconsin, and minimum population of 200 in Michigan).

In Minnesota, without federal protection, landowners within approximately 60 percent of the state may kill a wolf to "protect[] livestock, domestic animals, or pets" even when there is no immediate threat (MN DNR 2001). The Minnesota Plan also authorizes the establishment of "predator control areas" to take wolves near a livestock predation site, and it resurrects the old bounty system by paying state-certified predator controllers \$150 for each wolf killed.

In Wisconsin, the wolf management plan sets a target goal of 350 wolves (WI DNR 2007). The fact that Wisconsin has a target goal – rather than a statewide minimum number of wolves – makes a significant decline in its wolf population inevitable in the absence of federal

protections. Without federal protection “proactive control” of wolves by government trappers would be authorized statewide, and even wolves in wild areas that have not caused livestock predations would be killed. Furthermore, a 2018 state law not only authorizes but mandates the state DNR to allow hunting and trapping of wolves by private parties immediately upon removal of federal ESA protections. Wisc. Stat. Ann. 29.185(1m).

Laws passed in Michigan in 2008 liberalize wolf control and threaten recovery. *See* Mich. Comp. Laws §§ 324.95153, 324.95163. The expansive language of these laws does not limit lethal control to wolves in the act of attacking domestic animals and places no limit on how wolves can be killed. Mich. Comp. Laws §§ 324.95153, 324.95163. Even wolves on public lands can be killed. *Id.* And despite Michigan voters and courts rejecting wolf hunting in two 2014 referenda and a subsequent lawsuit, *Keep Michigan Wolves Protected v. State, Dept. of Natural Resources*, 2016 WL 6905923 (Mich. App. Nov. 22, 2016), a 2016 statute again added wolves to the state game species list, allowing private hunting and trapping upon federal delisting. Mich. Comp. Laws. § 324.40103(1)(kk) (as amended Dec. 22, 2016).

In the short time that wolves were delisted in the Western Great Lakes regions, people killed thousands of wolves for hunting, trapping and livestock predation control (USFWS 2015). Such widespread hunting and trapping led to population-level effects. By example, in Minnesota, a 2012-2013 count of the wolf population revealed that the population fell by 24% from the previous population count (conducted in 2008), much of which may be due to the over 400 wolves that were killed by hunters and trappers in the 2012-2013 hunting season—the first public hunt in the state in over four decades. *Id.* As another example, for the 2013-14 hunting season, Wisconsin set a hunting and trapping quota of one-third of the state’s wolves, and hunters and trappers killed 257 of approximately 822 wolves estimated to occupy the state (WI DNR 2014). The state’s wolf mortality rate was even higher than that, however, because of wolves lawfully killed pursuant to the state’s livestock predation control program, wolves poached illegally, and wolves killed by accidents, disease and natural causes.¹⁸ Moreover, state managers routinely underestimate the impact of wolf poaching (Treves et al. 2017).

¹⁸ Wisconsin state wildlife managers estimated that 126 wolves died in the year prior to the 2013-2014 hunting season due to causes other than hunting and trapping (WI DNR 2012). It would be arbitrary to conclude that the threat posed by human persecution to wolves in the midwestern U.S. has been ameliorated. Even with ESA protections, human-caused mortality – including vehicle accidents and illegal trapping and shooting – accounts for more than half of all wolf deaths in Wisconsin, with similar figures reported for Minnesota and Michigan (Thiel et al. 2009). *See also* 72 Fed. Reg. 6082 (2007 WGL delisting rule). Researchers who examined over 30 studies of human attitudes towards wolves have concluded that attitudes towards wolves have remained stable with “little support for FWS’s conclusion that attitudes towards wolves have improved, or are improving . . .” (Bruskotter et al. 2010; Shanning 2003, 2004; Naughton-Treves et al. 2003). Research based on longitudinal surveys in Wisconsin over a nine-year period concluded that culling of wolves either by agency staff or through state-sanctioned hunting seasons is associated with reduced social tolerance for wolves, increased inclination to poach wolves, and actual increases in poaching (Treves et al. 2013; Chapron and Treves 2016). Similarly, a new analysis from Finland finds that “culling” (permit-based hunting) does not increase social tolerance of wolves even in rural areas, and legal hunts (in an open season) do not

The remaining states in the proposed Midwest DPS provide little protection for wolves. Indiana and Kansas allow people to kill wolves causing conflicts with domestic animals. Iowa and North Dakota classify wolves as furbearers with closed seasons, while South Dakota classifies wolves in the eastern half of the state as predator/varmints that can be shot on sight. Kentucky, Ohio, and Missouri note only that the wolf is extirpated but provide no protections or plans for recovery. Only Illinois and Nebraska offer protection under state endangered species laws.

Inadequate State Regulatory Mechanisms in the Northern Rockies. In the Northern Rocky Mountains, where wolves have been delisted, 76 Fed. Reg. at 25,590¹⁹, aggressive livestock predation control and hunting under state management puts the population at risk and severely restricts the ability of wolves in that region to serve as a source population, as they once did.

In Wyoming, the Department of Game and Fish manages wolves with dual classifications of trophy game and predatory animals (Wyoming Game and Fish Dept. 2012). State managers allow unrestricted wolf killing (no limit on numbers of wolves taken, no specificity as to the methods of take, and no requirement to obtain a hunting license) in over 80% of the state where wolves are classified as predatory animals. W.S. § 23-1-101(a)(viii)(B). Even wolves in the trophy game area face high levels of exploitation. In 2017, the state instituted a wolf hunting season with the biological objective to reduce the wolf population in the trophy game areas by approximately 24%, and the end of year wolf population decreased 16% from 2016 to 2017 (Wyoming Game and Fish Dept. 2017). With populations declining within the state, Wyoming cannot be expected to serve as a source of dispersing wolves.

Similarly, wolf population numbers in Montana and Idaho suffer from high levels of human-caused mortality under management plans that call for livestock predation control, hunting and trapping (Idaho Legislative Wolf Oversight Committee 2002; Montana Fish Wildlife & Parks. 2004). Montana had 653 wolves when the Service removed federal protections in 2011; the population thereafter declined to 536 wolves in 2015 (Mech 2017). The most recent annual report indicates that 633 wolves lived in the state in 2017 (Montana Fish Wildlife and Parks 2017). In Idaho, wolf numbers peaked in 2008 at 856 in 2009 but have also since declined. Idaho reported 786 wolves in 2015 but no more recent numbers are available because the state no longer estimates the total number of wolves (Idaho Fish and Game 2017).

Inadequate State Regulatory Mechanisms in the Northeast. Inadequate regulatory mechanisms are primary threats to wolves in the Northeast. Because most northeastern states allow unlimited killing of coyotes, no effective protection exists for wolves that enter the region

reduce the long-term incidence of wolf poaching; the authors concluded that culling instead seems to maintain the social acceptance of aversion towards wolves (Laaksonen 2018).

¹⁹ The Act of Congress directing the Service to reissue this delisting rule does not prohibit the Service from issuing a separate rule re-listing or otherwise revising the status of the Northern Rocky Mountains DPS. Section 1713, Pub. L. 112-10, 125 Stat. 38 (Apr. 15, 2011).

(Way et al. 2010, p. 200; Glowa et al. 2009). In fact, all the wolves known to have dispersed into the region have been found killed (Glowa et al. 2009).

Moreover, state managers have done almost nothing to promote wolf recovery in the Northeast. Connecticut, Maine and Vermont consider the gray wolf a species of special concern but have taken no action aimed at promoting wolf recovery. Wildlife conservation strategies or action plans in Delaware, Maryland, Massachusetts, New Jersey, Pennsylvania and Rhode Island contain no mention of wolves, and the states offer them no protection.

The only states in the Northeast that protect wolves are New Hampshire and New York. The New Hampshire legislature passed a law (HB 240) in 1999 that bans the reintroduction of wolves into the state, although the law does not restrict natural recolonization by wolves (NHFGD 2011). In New York, the Department of Environmental Conservation lists wolves as extirpated with no plans for restoration (NYSDEC 2015).

B. Disease and Other Threats to Wolves

Disease. Disease has long been a serious threat to the gray wolf (Mech 2009). *See also* 75 Fed. Reg. 55,734. Wolf pathogens include canine parvovirus, canine distemper virus, mange, blastomycosis, Lyme disease, anaplasmosis, canine ehrlichiosis and heartworm (Stenglein and Van Deelen 2016).

Canine parvo virus has affected wolf recovery, killing between 40 and 60 percent of wolf pups in Minnesota (Mech et al. 2008). And because it is young wolves that disperse, reduced pup survival may cause reduced recolonization of unoccupied but suitable habitat (*id.*). Sarcopic mange has also slowed recovery in Michigan and Wisconsin, and the Service recognizes it as a continuing issue. 75 Fed. Reg. 55,734. Mange may increase wolf susceptibility to other diseases, and for example, oral papillomatosis was diagnosed in a Minnesota gray wolf with sarcopic mange (Knowles et al. 2017). Jara et al. (2016) found a high proportion of Wisconsin wolves were exposed to the agents that cause Lyme disease (65.6%) and anaplasma (47.7%), with a smaller proportion to ehrlichiosis (5.7%) and infected with heartworm (9.2%). In studies of disease in wolves in Yellowstone National Park, canine distemper virus (CDV) outbreaks and the presence and prevalence of mange are correlated with reduced pack growth rates. One has acute impacts on pup survival, while the other is linked to reduced pup survival and increased adult morbidity and mortality (Almberg et al. 2012).

As the population density of wolves increases, prevalence of disease is likely to increase. Global warming also increases the risk of disease outbreaks (Harvell et al. 2002). Studies reveal that warming temperatures can increase pathogen development, survival rates, and disease spread, with deleterious effects on host populations (Wilmers et al. 2006; USGS 2010). Parasites, such as the parasites that cause mange, may increase in many places, affecting more wildlife.

Reduced Genetic Diversity and Allee Effects. Isolation and small population size is a threat facing recolonizing wolves. Leonard (2014) concluded that cycles of repeated isolation and extinction has led to the observed low level of genetic diversity for gray wolves. Impacts of isolation and small population size can be compounded when those populations face other threats, like disease. Stenglein and Van Deelen (2016) found that a population also affected by

pathogens may be more prone to extinction than a population suffering from effects of small population alone, and that these effects can be more pronounced in social species, like wolves.

Moreover, existing wolf populations in the U.S. are below what scientists consider to be viable. For example, Traill et al. (2007) standardized estimates of minimum viable population (“MVP”) size for 212 species, including the gray wolf, and documented a median MVP of 4,169 individuals with a 95 percent confidence interval of 2,261 to 5,095. Likewise, Reed et al. (2003) used population viability analysis to estimate MVPs for 102 species, including the gray wolf, and found mean and median MVPs of 7,316 and 5,816 respectively. No region of the U.S. has wolf populations of that size. Wolves remain at risk until existing populations are connected through dispersal and satisfy the conservation biology principles of representation, resiliency, and redundancy—the three Rs—for reducing extinction risk and maintaining self-sustaining populations (Shaffer et al. 2000).

In sum, wolves continue to face threats to their survival and recovery. Threats to wolves are only going to increase if management is turned over to states without post-delisting management plans that strictly regulate discretionary mortality. Overutilization and inadequacy of state regulatory mechanisms and other threats -- in both occupied and unoccupied areas -- continue to threaten the species’ existence. *See* 16 U.S.C. § 1533(a)(1).

III. The Gray Wolf Continues to Qualify as Endangered or Threatened

As noted above, gray wolves previously inhabited most of North America, likely excluding only portions of the driest deserts and portions of the southeastern coastal plain of United States, which is the historical range of a separate canid species, the red wolf (*Canis rufus*). *See* 78 Fed. Reg. 35,664 (June 13, 2013). Scientists estimate that pre-European settlement as many as 2 million wolves may have lived in North America (Leonard et al. 2005). Today, multiple populations of gray wolves exist in the conterminous U.S. but the total population numbers less than 6,000 individuals.

Given the statutory definitions of “endangered” and “threatened,” 16 U.S.C. § 1532(6),(20), and the numerous court decisions interpreting them, gray wolves in the conterminous U.S. must remain protected until they are recovered in “all” “significant portions of their range.” *See, e.g., Humane Soc’y of the United States v. Jewell*, 76 F. Supp. 3d 69, 130 (D.D.C. 2014) (rejecting 2011 WGL DPS delisting rule); *Defenders*, 354 F. Supp. 2d at 1167, n.8 (rejecting 2005 downlisting rule). The Service cannot rely on its flawed interpretation of “significant portion of its range” to ignore wolf status outside of core population areas given that its “SPR Policy” has been recently vacated. *Desert Survivors v. U.S. DOI*, Case No. 16-cv-01165-JCS (N.D. Cal. Aug. 24, 2018); *see also Ctr. for Biological Diversity v. Jewell*, 248 F. Supp. 3d 946, 955–58 (D. Ariz. 2017) (rejecting SPR Policy in case involving the cactus ferruginous pygmy owl).

As explained below, numerous significant portions of the wolf’s range in the lower 48 states lack viable wolf populations and thus the wolf must remain protected under the ESA.

A. The Proposed Lower 48 DPS Qualifies as Threatened

Breeding populations of gray wolves remain absent from roughly 90 percent or more of their historical range in the United States (see **Figure 3**). The loss of roughly 90 percent of a species' historical range must be considered a "significant" portion. Numerous cases hold that a species is considered absent "throughout . . . a significant portion of its range" "if there are major geographical areas in which it is no longer viable but once was." *Def. of Wildlife v. Norton*, 258 F.3d 1136, 1145 (9th Cir. 2001) (flat-tailed horn lizard).²⁰ As such, due to the lost historical range, wolves in the Lower 48 DPS qualify as a threatened species.

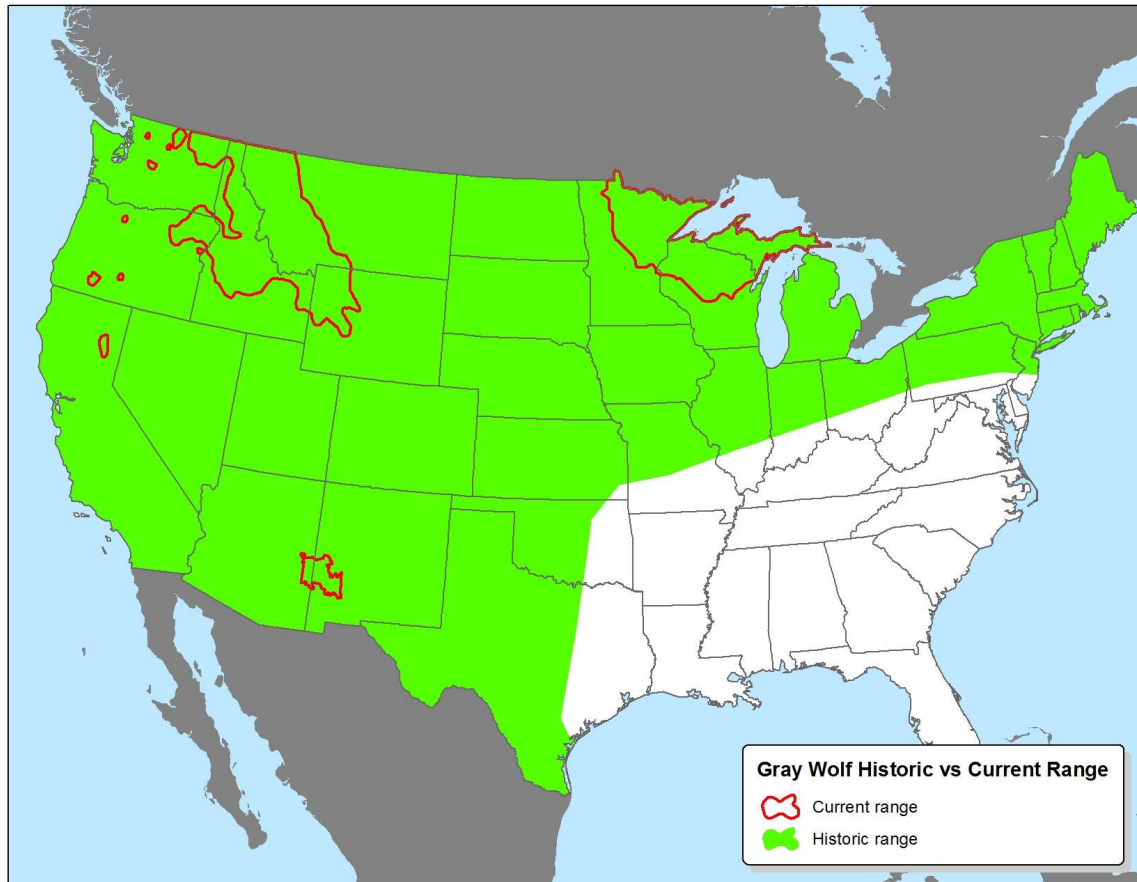


Figure 3. Historic and current range of the gray wolf in the lower 48 states.

²⁰ See also *Tucson Herpetological Soc’y v. Salazar*, 566 F.3d 870, 877 (9th Cir. 2009) (holding that the Service must “develop some rational explanation” for why lost and at-risk portions of a species’ range are not significant); *Colo. River Cutthroat Trout v. Salazar*, 898 F. Supp. 2d 191, 202-03 (D.D.C. 2012) (adopting and applying “the Ninth Circuit’s approach of requiring that the Service provide some reasoning for why a historical contraction in range does not reflect a ‘risk of extinction throughout . . . a significant portion of its range’”); *WildEarth Guardians v. Salazar*, 741 F. Supp. 2d 89, 100-01 (D.D.C. 2010) (vacating and remanding FWS finding where agency had not explained why 87 percent range reduction for the Utah prairie dog was not significant portion of species’ range); *Defenders of Wildlife v. Norton (Lynx I)*, 239 F. Supp. 2d 9, 21 (D.D.C. 2002) (vacated in part on other grounds).

Moreover, scientists have identified extensive wolf habitat in areas where wolves have not yet recovered (e.g. Mladenoff et al. 1995; Carroll et al. 2006; Morell 2008). In the western United States, this includes the Central and Southern Rocky Mountains in both Colorado and Utah, the Olympic Peninsula in Washington, the Cascade Mountains in Washington, Oregon and California and the Sierra Nevada in California. In the Northeastern United States, thousands of square miles of terrain spanning upstate New York and portions of Vermont, New Hampshire and Maine were identified as capable of supporting a wolf population. And some studies indicate the lower peninsula of Michigan could support wolves, as well as the Dakotas. Because these “significant portions” of the wolf’s range lack viable wolf populations, the proposed Lower 48 DPS qualifies for ESA protections.

According to mapping and modeling by scientists at the Center for Biological Diversity, approximately 538,000 square miles of suitable wolf habitat exist in the lower 48 states, of which roughly 171,000 square miles were occupied (Weiss et al. 2014). That means wolves have recovered to only roughly 30 percent of known suitable habitat. Thousands of additional wolves could likely populate the Northeast, Southern Rockies, and West Coast, nearly doubling the existing population and creating a network of interconnected populations bolstering genetic security.²¹

Even the Service has determined that wolves remain unrecovered in areas that could support them. 65 Fed. Reg. at 43,462 (identifying favorable wolf habitat in the Northeast); 71 Fed. Reg. 15279 (discussing unoccupied wolf habitat in Michigan and North Dakota); 65 Fed. Reg. at 43474 (noting that “there is certainly habitat that could support wolves” in western states such as Oregon, Utah, and Colorado); 68 Fed. Reg. at 15,814 (recognizing “expansive” habitat in Maine and New Hampshire and suitable, but isolated, habitat in New York); 68 Fed. Reg. at 15,814 (documenting an increasing number of wolves dispersing to North Dakota and South Dakota); 68 Fed. Reg. at 15,814 (explaining that the Pacific Northwest contains “suitable habitat and prey conditions” and anticipating “additional movement . . . into western Washington and Oregon and into the Cascade Range”); 78 Fed. Reg. at 35,680 (describing areas within the historical wolf range that lack “robust” wolf populations as the “Southern Rocky Mountains and Colorado Plateau, northern California, western Oregon, and western Washington.”); 78 Fed. Reg. at 35,685, 35,712 (discussing protected lands in Oregon and Washington where wolves could recolonize). The best available science shows overwhelming agreement that large tracts of suitable wolf habitat remain present in the proposed Lower 48 DPS.

Importantly, areas of unoccupied but suitable wolf habitat could be reoccupied. Wolves are long-range dispersers, capable of traveling for hundreds of miles in search of mates, adequate prey base, and suitable colonizing locations (Linnell et al. 2005). Experience shows that with federal protections, wolves expand their range (e.g. dispersal of wolves from Minnesota to

²¹ The Center scientists primarily reviewed available wolf habitat across the western United States, the upper Midwest and the Northeast. These areas encompass the majority of remaining gray wolf habitat but do not address the range of the red wolf in the Southeast, areas of potential gray wolf habitat in the Appalachian Mountains, or potential habitat in North and South Dakota—all areas that should be the subject of additional modeling prior to any final determinations about remaining suitable wolf habitat in the United States.

Wisconsin and Michigan; from the Northern Rocky Mountains to the Pacific Northwest; from the Northern Rocky Mountains to the Southern Rocky Mountains; from the Pacific Northwest to California). **Figure 4** shows a map of verified wolf dispersal events from 1981-2014. Since then, additional dispersal events have been documented, including from California to Nevada and from Minnesota to Missouri and the Dakotas (e.g. Associated Press 2017; Davis 2014; Huber 2015; Dokken 2017; Ferreira 2018). **Appendix B** summarizes known dispersal events, and we submitted documents establishing these dispersals with this petition. The fact that wolves could – through dispersal or reintroduction – reoccupy presently unoccupied but suitable wolf habitat provides additional reasons why these “significant portions” cannot be reasonably ignored when determining whether wolves in the conterminous U.S. continue to meet the definitions of endangered and threatened species.

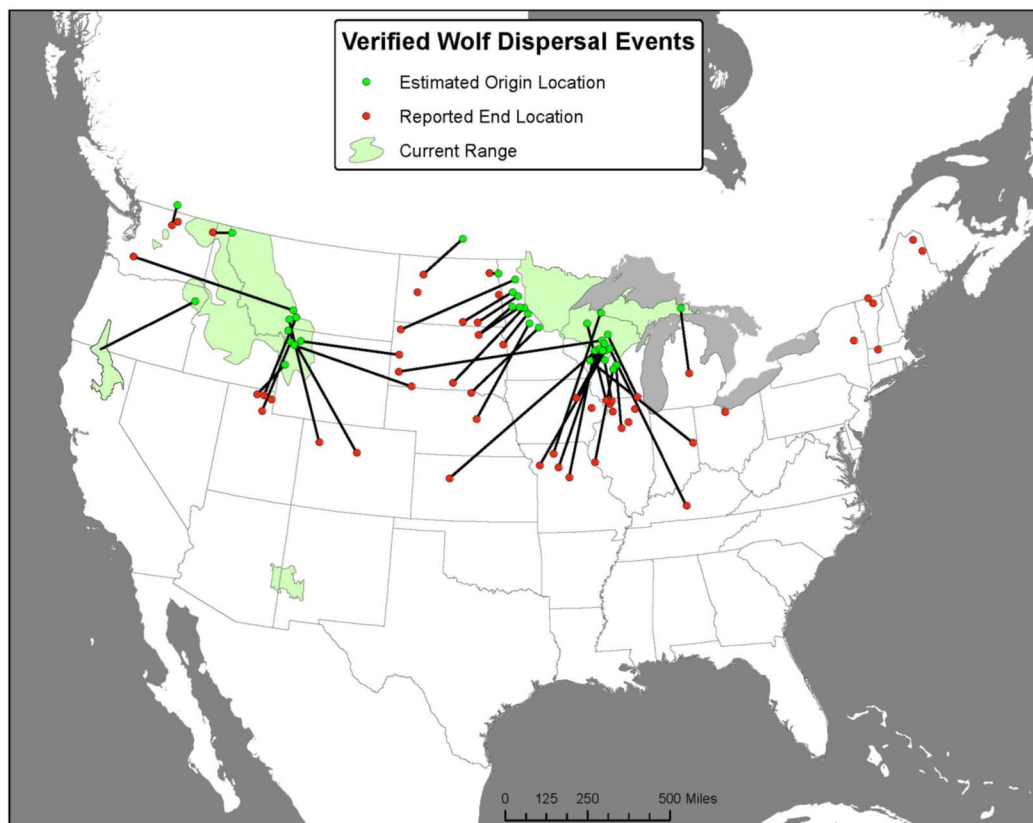


Figure 4. Map of verified wolf dispersal events from 1981-2014 (Weiss et al. 2014; see **Appendix B**).

Given the absence of viable wolf populations in these “significant” areas, the proposed Lower 48 DPS qualifies for protection under the ESA as a “threatened” species. Because of hostile state regulations in the Northern Rocky Mountains and because the DPS Policy does not allow excluding that region for political reasons, the Service must apply the threatened status uniformly within this DPS. As such, under this alternative, wolves within the area designated by the Service as the “Northern Rocky Mountains DPS” would regain federal protections as “threatened” along with the rest of the Lower 48 DPS.

B. The Proposed Eastern and Western DPSs Qualify as Threatened

For the same reasons explained above in the section on the proposed Lower 48 DPS, the proposed Eastern and Western DPSs should be listed as “threatened.”

C. The Proposed Regional DPSs Qualify as Endangered or Threatened.

The proposed regional DPSs qualify as either “endangered” or “threatened” based on the population status in those regions and, as discussed above, ongoing threats to wolves.

1. The Proposed West Coast DPS Qualifies as Endangered.

Wolves have begun to repopulate habitat west of the delisted Northern Rocky Mountains DPS in the Pacific Northwest and California. 77 Fed. Reg. at 35,711. And with continued protection, wolves will continue to expand into the proposed West Coast DPS. *Id.* But they occupy just a small fraction of the available habitat and therefore meet the definition of an endangered species. *See, e.g., Colo. River Cutthroat Trout v. Salazar*, 898 F. Supp. 2d 191, 202-03 (D.D.C. 2012).

At the end of 2017, Oregon was home to just 11 known breeding pairs with a total minimum of 124 wolves (Oregon Dept. Fish and Wildlife 2018). However, most of these wolves live in the eastern half of the state that lost federal protection with delisting of the Northern Rocky Mountain DPS. Wolf breeding outside of the delisted portion was first documented in 2014 by the Rogue Pack (Oregon Dept. Fish and Wildlife 2015). And that pack continues to be recognized as a breeding pair in the western portion of the state (Oregon Dept. Fish and Wildlife 2018). Washington had at least 122 wolves in 22 wolf packs with a total of 14 successful breeding pairs in 2017, but most of these live in the delisted portion (Washington Dept. Fish & Wildlife 2017). In California, the most recent data shows just one pack in the state (California Dept. of Fish and Wildlife 2018). That pack, known as the Lassen Pack, has successfully given birth to at least two pups in the state for two consecutive years (*id.*). (Such reproduction satisfies the Service’s definition of a population.²²)

2. The Proposed Midwest DPS Qualifies as Threatened.

Wolves have made progress toward recovery in Minnesota, Wisconsin and Michigan. In Minnesota, state managers estimated 2,856 wolves for the 2016-17 mid-winter population (MN DNR 2017b). At last count in 2015, Wisconsin had 883-924 wolves living in 238 packs and an additional 22 non-pack associated wolves (WI DNR 2015). State managers in Michigan found 662 wolves among 139 packs across the Upper Peninsula this past winter in 2017-2018 (MI DNR 2018). Robust populations in these states are needed to allow further recovery through dispersals to unoccupied areas (Treves et al. 2009).

But no breeding populations of wolves are known from the remaining states in the proposed Midwest DPS, and significant portions of the wolf’s range remain unoccupied. For

²² The Service in wolf rulemakings has defined “population” to mean “at least 2 breeding pairs of wild wolves successfully raising at least 2 young each year (until December 31 of the year of their birth), for 2 consecutive years.” 77 Fed. Reg. at 35,711.

example, Claeys (2010) identified approximately 3,000 km² of unoccupied suitable habitat in the Lower Peninsula of Michigan that could support 52-63 wolves. Confirmed gray wolves have dispersed into the Lower Peninsula on multiple occasions and most recently in 2015 (Ellison 2015). Licht and Huffman (1996) identified the Turtle Mountain region of North Dakota as capable of supporting wolves, and the Black Hills of North Dakota could also likely support wolves, and dispersing wolves have been identified in the area (Huber 2015). Because significant portions of the wolf's range in the proposed Midwest DPS lack viable wolf populations, this DPS must be listed as threatened.²³

3. The Proposed Northeast DPS Qualifies as Endangered.

A breeding population of wolves has not been documented in the Northeast in recent times. Yet numerous confirmed wolves and unidentified canids have dispersed into the region (Glowa et al. 2009). As a few examples, in 1993 a single female wolf was killed in western Maine, and in 1996 a second wolf or wolf-like canid was trapped and killed in central Maine. 68 Fed. Reg. 15,814. Another wolf-like canid was mistaken for a coyote and killed in 1997 in northern Vermont. *Id.* In January of 2002, a wolf was snared near the town of Sainte-Marguerite-de-Lingwick, Quebec, south of the St. Lawrence River and approximately 32 km from the New Hampshire border (Villemure and Jolicoeur 2003). The trapper claimed to have seen other wolves in the area (Glowa et al. 2009). This report is evidence that wolves can cross the St. Lawrence River from Canada and disperse into the northeastern U.S. (Wydeven et al. 1998; Harrison and Chapin 1997, 1998). Indeed, the well-established wolf population in Canada's Algonquin National Park is just 120 miles from the New York border. But no comprehensive surveys document the extent of the dispersing population. The lack of a viable wolf population in the Northeast means that this proposed DPS must be listed as endangered.

4. The Proposed Southern Rocky Mountains DPS Qualifies as Endangered.

No breeding population of wolves has been yet documented in the proposed Southern Rocky Mountains DPS. But wolves have dispersed into the region on several occasions. In 2002, a wolf was trapped in northeastern Utah (southwest of Ogden), and the Service released the wolf into Grand Teton National Park, where it likely originated (USFWS 2002). The Service explained that "[s]ubsequent reports have indicated that more wolves are present in northeast Utah" (*id.*). In 2004, a wolf died after being struck by a car on I-70 about 30 miles west of

²³ Threatened status for wolves in the Midwest DPS is also necessary given the possibility that a second wolf species, the eastern wolf (*C. lycaon*), may exist in the region. The presence of a second species would mean that the population numbers of gray wolves upon which the Service has relied are overinflated. The Service must also analyze how hybridization could be affecting the viability of gray wolves. It is possible that hybridization with eastern wolves is threatening the genetic uniqueness of the gray wolf. Also of concern is hybridization with coyotes. Nowak (2009, p. 246) cautions that if intact populations of eastern wolves undergo further introgression from coyotes, and if eastern wolves are indeed spreading westward, gray wolves would become exposed to intensified genetic introgression from coyotes. Indeed, scientists have concluded that gray wolves have not been restored to the Great Lakes region because of widespread hybridization with coyotes (Leonard and Wayne 2008a, 2008b; Nowak 2009).

Denver (USFWS 2004). In 2006, a black canid, that appeared to be a wolf was videotaped in northern Colorado (Gonzales 2006). In 2009, a wolf was poisoned by Compound 1080 south of Meeker, Colorado (USFWS 2011). In 2010, two wolves were shot and killed in Utah in Cache and Rich counties (Love 2010). In December of 2014, a coyote-hunter shot and killed a wolf in west-central Utah; she had previously been seen on North Rim of Grand Canyon and named “Echo” (Ketcham 2015). In April 2015, a wolf was mistaken for a coyote and shot and killed in northwestern Colorado (Padilla 2016).

Given the absence of a viable wolf population in this significant and discrete region where wolves could recover, the proposed Southern Rocky Mountains DPS qualifies as endangered.

5. The Existing Northern Rocky Mountains DPS May Remain Delisted.

Petitioners recognize that the Service delisted the Northern Rocky Mountains DPS. 76 Fed. Reg. 25,590 (May 5, 2011); 77 Fed. Reg. 55,530 (Sept. 10, 2012). While we object to the lack of a scientific basis for the 2011 Act of Congress directing the reissuance of the Service’s delisting rule as to part of the DPS,²⁴ and note the ongoing presence of threats to the population due to inadequate state regulatory mechanisms and overutilization as described above, Petitioners do not seek relisting of the Northern Rocky Mountains DPS under this regional DPS approach.

IV. The Proposed Framework Allows Regulatory Flexibility

With “threatened” listings, the Service could approve state officials to use lethal control to deal with bona fide wolf conflicts where consistent with the best available science and the overarching conservation goals of the ESA. The Section 4(d) rule that currently applies to wolves in Minnesota could be instructive, as it narrowly allows for livestock predation control “within one-half mile of the place where such depredation occurred,” performed “in a humane manner” and with mandatory release of “any young of the year taken on or before August 1.” 50 C.F.R. § 17.40(d).²⁵

Another important feature of the Minnesota rule is provision of refugia in northeastern Minnesota (“Zone 1”) where the prohibition on take applies without any allowance for livestock predation control. *Id.* We ask the Service to identify similar refugia for any Section 4(d) rule that it may promulgate for the threatened DPSs proposed in this petition. Indeed, scientists have documented the importance of such protected areas. For example, Sazatornil et al. (2016) recommends that managers provide wolves shelter from human interference to provide ideal breeding sites.

²⁴ P.L. 112-10 Section 1713 directed reissuance of the 2009 delisting rule as to the parts of the DPS outside of Wyoming but did not prohibit the Service from extending ESA protections to wolves in the Northern Rockies DPS in the future.

²⁵ Under the existing Section 4(d) rule for Minnesota, “[d]esignated employees or agents of the Service or the Minnesota Department of Natural Resources” may kill gray wolves in response to attacks on domestic animals. 50 C.F.R. § 17.40(d)(2)(i)(C). Petitioners request that any future Section 4(d) rule clarify that “agents” must be government employees.

With adoption of the petition's proposed framework, the Service should also craft a national recovery plan for the gray wolf—something it has never done before (Robinson and Greenwald 2010).

CONCLUSION

For all the reasons explained above, the Service must maintain protections for the gray wolf. Specifically, Petitioners believe that the existing ESA listing for gray wolves may, upon further review by the Service, warrant revision as follows:

- (1) Gray wolves could be listed as threatened as a Lower 48 DPS throughout the coterminous United States, except as noted below, or the Service could split the existing listing into two or more DPSs that encompass the entire range of the gray wolf in the coterminous U.S. and assign threatened status or retain endangered status to those DPSs as detailed above.
- (2) Mexican wolves (*C. l. baileyi*) are properly designated a separate subspecies of gray wolf in the southwestern United States and should remain listed as endangered.
- (3) Gray wolves were likely present in the Appalachian Mountains, and some overlap may exist within the historic ranges of gray wolves (*C. lupus*) and red wolves (*C. rufus*). Until the best available science makes clear that gray wolves were erroneously listed in a portion of the southeastern United States, this region should continue to be included within the listing for gray wolves and included in recovery planning for the species.

Authored by:

Collette Adkins, Senior Attorney
Center for Biological Diversity

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