



**By Electronic Submittal and U.S. Mail**

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Public Comments Processing  
Attn: FWS-R3-ES-2011-0029  
Division of Policy and Directives Management  
U.S. Fish and Wildlife Service  
4401 N. Fairfax Drive, MS 2042-PDM  
Arlington, VA 22203

Re: Proposed Rule to Revise the List of Endangered and Threatened Wildlife for the Gray Wolf (*Canis lupus*) in the Eastern United States, Initiation of Status Reviews for the Gray Wolf and for the Eastern Wolf (*Canis lycaon*)

To Whom It May Concern:

On behalf of the Natural Resources Defense Council (NRDC) and our 1.3 million members and activists, please accept these comments on the U.S. Fish and Wildlife Service's (Service) proposed rule to remove the Upper Midwest's population of gray wolves from the list of endangered species and to recognize a new species of wolf, *Canis lycaon*, in the Eastern United States. See Proposed Rule to Revise the List of Endangered and Threatened Wildlife for the Gray Wolf (*Canis lupus*) in the Eastern United States, Initiation of Status Reviews for the Gray Wolf and for the Eastern Wolf (*Canis lycaon*), 76 Fed. Reg. 26086-26144 (May 5, 2011) (Proposed Rule).

Fundamentally, NRDC supports the delisting of gray wolves in the Midwest, including in Minnesota, Wisconsin and Michigan. However, NRDC does not believe that the best available scientific evidence supports the recognition of *Canis lycaon* as a species. Additionally, the proposed reclassification of many wolves occurring in the Midwest and all wolves in the northeastern United States, as *Canis lycaon* is unnecessary at this time and undermines, perhaps fatally, the Service's delisting proposal for Midwest wolves. Finally, NRDC strongly urges the Service to recognize and list a Distinct Population Segment (DPS) of wolves in the Pacific Northwest.

**I. Wolves in the Upper Midwest Constitute a Valid Distinct Population Segment and Should Be Delisted; However, the Proposed Rule Needs Improvement**

As a general matter, NRDC supports the delisting of wolves in the Great Lakes region. We agree with the Proposed Rule that wolves in the Upper Midwest constitute a distinct, significant, and recovered population. However, the Service could strengthen the Proposed Rule's delisting of a Great Lakes DPS, and make it better reflect current scientific research, with some modifications.

A. The Service Should Treat Wolves in the Upper Midwest as a Single, Connected Population and Analyze Them as Such

As the Proposed Rule acknowledges, wolves in the Great Lakes region represent well over 4,000 individuals in a continuous “connected” population across Minnesota, Wisconsin and Michigan. 76 Fed. Reg. at 2601. As described below, the best available science shows that a population of this size constitutes a viable, recovered population of wolves. However, instead of analyzing this single connected population for what it is, the Proposed Rule repeatedly implies that isolated wolf populations of 200 or even 100 individuals in the Great Lakes, as identified in the revised recovery plan for the region (USFWS 1992), would still be considered “viable.” See, e.g., id. at 26096, 26098, 26100. The best available science does not show, however, that such small isolated populations of wolves are viable and the Service’s delisting analysis should not be premised on such an assumption. Rather, it should analyze the gray wolf’s recovery in the Great Lakes Region based on the maintenance of a single, large and connected population.

It is a well-established principle of conservation biology that populations of organisms need substantial and robust numbers of individuals to maintain viability. An often cited estimate for minimum population viability (MPV) is an effective population size ( $N_e$ ) of 500 individuals to avoid the effects of genetic loss due to drift (Soule and Wilcox 1980, Frankel and Soule 1981, Soule 1986, Franklin and Frankham 1998). For these reasons, Soule and Simberloff (1986) concluded that “estimates of MVPs for many animal species are rarely lower than an *effective size* of a few hundred.” Since effective population sizes are generally only 10-20% of the census population, this lower limit translates into a total population count of 2,500-5,000 individuals (Frankham 1995, Palstra and Ruzzante 2008).

Other estimates have predicted that viable population numbers should be even higher. For example, Lande (1988) criticized the application of a blanket number like  $N_e=500$  because it fails to consider critical species-specific demographic data. Lande then outlined examples in which demographic parameters, such as an allee effect, stochasticity, edge effects or local extinctions in a patchy habitat, could require populations to have even larger numbers than an effective population of 500. Lande (1995) further explored this topic in the context of genetic variation and mutation and concluded that effective populations should number in the 5,000s. C. D. Thomas (1990) also estimated that MVPs should number in the thousands – ideally, 10,000 individuals for populations that experience fluctuations. Similarly, in 2004, Reed and Hobbs examined the population viability of 2,387 populations of 203 species and found that vertebrates need to number in the thousands for effective conservation.

Recently, a number of studies have been published that examine population viability of gray wolves specifically, based on empirical data. Brook et al. (2006) estimated the MVP for 1,198 species including the gray wolf and found that the median overall estimate was 1,377 individuals. Traill et al. (2007) conducted a meta-analysis of MVPs for 212 species including gray wolves and concluded that the MVP for most species will exceed a few thousand individuals. Finally, Reed et al. (2003) estimated the minimum viable population size for over 100 vertebrate organisms, including the gray

wolf. The MVP for *adult* gray wolves was estimated at 1,403. When Reed et al. (2003) corrected for 40 generations worth of data, the MVP for gray wolves was estimated to be 6,332.

Finally, Traill, Brook, Frankham and Bradshaw (2009) jointly reviewed empirical and theoretical MVP estimates published over the past few decades and determined:

This literature collectively shows that thousands (not hundreds) of individuals are required for a population to have an acceptable probability of riding-out environmental fluctuation and catastrophic events, and ensuring the continuation of evolutionary processes. The evidence is clear, yet conservation policy does not appear to reflect these findings, with pragmatic concerns on feasibility over-riding biological risk assessment.

Furthermore, these researchers conclude:

Current evidence from integrated work on population dynamics shows that setting conservation thresholds at a few hundred individuals only is a subjective and non-scientific decision, not an evidence-based biological one which properly accounts for the synergistic impacts of deterministic threats...Many existing conservation programs might therefore be managing inadvertently or implicitly for extinction.

While a subsequent paper criticized Traill et al. (2009) by arguing that species are likely to have unique ecological traits such that a blanket “magic number” cannot be applied broadly across all species, those authors nonetheless conclude, “We also suspect (as have others long before [60]) that multiple populations totaling thousands (not hundreds) of individuals will be needed to ensure long-term persistence.” (Flather et al. 2011).

In short, there is now substantial and compelling evidence that populations must number in the thousands of individuals to ensure long-term viability, which suggests that the Service’s original determination that wolf populations of 100-200 wolves constitute a viable population is not based on the best available science. As such, we believe that the Service should base its evaluation of wolf recovery in the Great Lakes region on the population as a whole.

B. The Service Should Recognize That North Dakota Has and Will Continue to Support Breeding Pairs of Wolves

While the Proposed Rule includes the eastern half of North Dakota in the Great Lakes DPS, it excludes the entire state from the “current wolf range.” 76 Fed. Reg. at 26102. Yet, the number of documented wolf sightings in North Dakota has been increasing. 76 Fed. Reg. at 26,117. Between 1981 and 1992, ten wolves were killed in the Dakotas (Licht and Fritts 1994, pp. 76-77). Six more have been killed in North Dakota since 1992, including an adult male shot near Devil's Lake in 2002 and an adult male shot in Richland County in 2003. 76 Fed. Reg. at 26100. In 2005, one wolf was

sighted near the Carter Dam area north of Greene, three wolves were sighted near Minot, and one wolf was sighted near Carpio. In 2009, a wolf was found dead in Eddy County. 76 Fed. Reg. at 26,117. From 1993 to 1998, six wolf depredation reports were investigated in North Dakota, two of which were verified. From 1999-2003, 16 wolf sightings and depredation incidents in North Dakota were reported to USDA-APHIS-Wildlife Services, nine of which were verified. 76 Fed. Reg. at 26117. And in late 2005, two wolf depredation incidents were verified north of Garrison. Id.

Many of the wolf sightings in North Dakota have occurred in the Turtle Mountains, a deciduous forest ecosystem in the northern part of the state that straddles the Canadian border. Between January 1, 1992, and December 31, 1995, the Service's Ecological Services program recorded 34 wolf sightings, 12 of which were in the Turtle Mountains (Licht and Huffman 1996, p. 171). During the same time period, U.S. Department of Agriculture Animal Damage Control (no Wildlife Services) personnel reported 17 incidents of wolf tracks in the Turtle Mountains, and other reports of wolves came from within 25 kilometers (km) of the Turtle Mountains. Id. Unlike in other areas of North Dakota, there is evidence that wolves in the Turtle Mountains are not simply dispersers. Rather, at least one breeding pair has been reported in the vicinity. Id. (citing Collins in litt. 1998). Clusters of wolf reports are a better indicator of established wolf territory than are individual reports (Fritts et al. 1995, pp. 107-126). The relatively high number of wolf reports in the Turtle Mountains area, combined with the fact that the reports have been made during every season, suggests that wolves have established populations in the vicinity (Licht and Huffman 1996, p.172).

Not only is there evidence that a non-dispersing population of wolves exists in the Turtle Mountains, but also the area appears to provide suitable habitat for wolves due to its low road density, low human density, and adequate prey base. According to the Proposed Rule, road density is the best predictor of habitat suitability in the Midwest due to the correlation between roads and human-related wolf mortality. 76 Fed. Reg. at 26107-08. In fact, road density is such a strong indicator of established wolf territory that some scientists have used this factor alone to determine areas of suitable wolf habitat. 76 Fed. Reg. at 26106. Most scientists have concluded that, in order to maintain breeding packs, an area should have a road density of 0.7 km per square (sq) km or less (Mladenoff et al. 1995, p. 289).<sup>1</sup> The North Dakota section of the Turtle Mountains meets this criterion, with 0.54 km of roads per sq km (Licht and Huffman 1996, p. 172). In terms of human density, at least one study has indicated that the 1.2 humans per sq km in North Dakota's section of the Turtle Mountains is low enough for wolves to establish a viable population (Id., p. 172). This is bolstered by the Proposed Rule, which states that in Minnesota, areas with a human density of up to 4 people per sq km are suitable if they have road densities of less than 0.7 km of roads per sq km. 76 Fed. Reg. at 26,106. Lastly, the Turtle Mountains maintain a sufficient prey base of

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<sup>1</sup>While the Proposed Rule discusses a number of studies regarding road density, it does not explicitly state what it considers to be an acceptable figure. Additionally, the Proposed Rule does not specify the road densities in areas that *have* been included in the current range of the Great Lakes wolf. Thus, it is difficult to discern what the Service views as an acceptable road density. However, the majority of the studies the Proposed Rule cites deem road densities of 0.7 km per sq km acceptable.

large ungulate species to support a viable wolf population, with white-tailed deer, moose, and elk populations (Licht and Huffman 1996, p. 172).

Given these facts, we question the Proposed Rule's conclusion that the existence of a wolf population in North Dakota would not "make a meaningful contribution to the maintenance of the current viable, self-sustaining, and representative metapopulation of wolves in the proposed WGL DPS." 76 Fed. Reg. at 26131. We therefore recommend that the Service revise the Proposed Rule to include North Dakota's Turtle Mountains in the current range of the Great Lakes wolf and analyze its delisting rule accordingly.

### C. The Service Should Seek Improvements in State Management Plans

As part of its delisting analysis, the Proposed Rule examines the adequacy of regulatory mechanisms that will be in place to protect wolves in the Great Lakes region, post-delisting. 76 Fed. Reg. at 26118; 16 U.S.C. § 1533(a)(1)(C). Most important among these mechanisms are the presence and adequacy of management plans in the States in which wolves are found.

In evaluating these or other existing regulatory mechanisms, however, the Service is not permitted to rely on non-binding or speculative conservation plans. Greater Yellowstone Coal., Inc. v. Servheen, 672 F. Supp. 2d 1105, 1115-17 (D. Mont. 2009); Or. Natural Res. Council v. Daley, 6 F. Supp. 2d 1139, 1141 (D. Or. 1998); Save Our Springs v. Babbitt, 27 F. Supp. 2d 739, 748 (W.D. Tex. 1997). Specifically, the Service cannot rely on state management plans if the plans contain "goals" and "guidelines" rather than legally enforceable standards. Greater Yellowstone, 672 F. Supp. 2d at 1117. The Service is also forbidden from relying on plans that fail to require action in the event stated goals are not achieved. Id. This limitation on the "existing regulatory mechanisms" factor makes sense, because "[a]bsent some method of enforcing compliance, protection of a species can never be assured." Or. Natural Res. Council, 6 F. Supp. 2d at 1155.

In this case, wolf management plans have been approved in Minnesota, Wisconsin, and Michigan.<sup>2</sup> While these plans have many strengths, they could be improved. Most troubling, perhaps, is the fact that while the Minnesota wolf management plan is state law, the Wisconsin and Michigan plans are non-binding agreements instead of legally enforceable standards. But the Minnesota Plan is also flawed because it states only that the Minnesota Department of Natural Resources (DNR) will "take appropriate management actions to address the cause of the reduction and assure recovery to the

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<sup>2</sup> As the Proposed Rule notes "North Dakota lacks as State endangered specie slaw or regulation and wolves are currently classified in the state as only "having a moderate level of conservation priority" because they "are believed to be peripheral or do not breed in North Dakota." 76 Fed. Reg. at 26131. Given the existence of suitable wolf habitat in North Dakota as well as documented instances of breeding pairs in the State we urge the Service to encourage North Dakota to revise its classification of the wolf and adopt a wolf management plan for the State.

minimum level in the shortest possible time” if the population falls below this number.<sup>3</sup> However, the Plan does not specify what these actions are or mandate any required actions if the wolf population falls below minimum levels. By contrast, if the wolf population falls below 250 wolves for 3 years, the Wisconsin Plan commits the State to recommend listing wolves as threatened under Wisconsin’s Endangered Species Act, and wolves will reach endangered status if their population falls below 80 for 1 year. 76 Fed. Reg. at 26123.

Additionally, whereas the Minnesota and Michigan plans allow for possible population growth, we are concerned that Wisconsin’s state plan aims to manage the state’s wolf population at half of its current size (350 versus ,) which would likely require aggressive reduction efforts.

Despite these flaws, however, we believe that the Minnesota, Wisconsin, and Michigan plans, if successfully implemented, will succeed in maintaining a viable wolf population. Even if these three states allowed their wolf populations to drop to the minimum numbers identified in their plans, the tri-State wolf population would still number above 2,000 individuals. Therefore, while we maintain that these state management plans should be legally enforceable and could be strengthened, we also believe that, if followed as described, the Great Lakes population of wolves will continue to be managed for a recovered population upon delisting.

## II. The Service Should Not Recognize *Canis lycaon* at This Time

### A. The Service’s Taxonomic Revision is Not Supported by the Best Available Science

While the issue of wolf taxonomy has long been debated, the existence of an Eastern wolf, *C. lycaon*, as a separate species is not fully supported by the scientific community. In fact, the Service has based its taxonomic revision on a fundamental misunderstanding of the data. Additionally, the taxonomy of wolves in this region is the subject of current and active research. As such, it is premature to declare the existence of *C. lycaon* as a distinct species and the Service should, at a minimum, reevaluate its proposed taxonomic revision in a separate rule-making process outside of the Great Lakes delisting rule.

The taxonomy of canids in the Great Lakes region and the northeastern United States is complicated by a series of both historic and recent hybridization events between wolf and coyote populations. Scientists generally agree that wolves in the Great Lakes and northeastern United States are characterized by a smaller body size than their western gray wolf relatives. This could be due to local adaptation to the smaller prey size of deer in this region and may, in part, explain why hybridization with coyotes has occurred in this area but not in other regions of the gray wolf’s range (see Koblmuller et

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<sup>3</sup> *Minnesota Wolf Management Plan*, MINNESOTA DEPARTMENT OF NATURAL RESOURCES, 20 (Feb. 2001) (available at <http://www.fws.gov/midwest/wolf/stateplans/pdf/mn-wolf-plan-01.pdf>).

al. 2009). The smaller body size may, alternatively, be a result of early hybridization with coyotes.

1. Alternative Hypotheses Regarding Coyote-like Haplotypes Found in Wolves

Controversy over the existence of *C. lycaon* centers around the fact that some wolf-like canids have been found to contain genetic material that groups more closely with coyotes than with gray wolves (Wilson et al. 2000, 2003, Kyle et al. 2006, Leonard and Wayne 2007, Koblmuller et al. 2009, Wheeldon et al. 2010). Notably, certain haplotypes that are coyote-like are currently found only in wolves – including some historic samples of wolves in an area in the east before coyotes were present there. This pattern has been explained by competing hypotheses. One hypothesis is that the existence of the coyote-like haplotypes in current wolves is a reflection of an ancient hybridization event between gray wolves (*C. lupus*) and coyotes (*C. latrans*) in which the corresponding haplotype in coyotes has since diverged or disappeared (Leonard and Wayne 2007, Koblmuller et al. 2009). The hybridization event would have taken place within the geographic range of overlap for the two species and moved east geographically via gray wolf dispersal. The competing hypothesis, embraced by the Proposed Rule, is that although the haplotypes are coyote-like, they actually represent a separate species of wolf—*C. lycaon*, which is distinct from gray wolves (*C. lupus*) and closely related to coyotes (Wilson et al. 2000, Wheeldon and White 2009, Wheeldon et al. 2010). This conclusion essentially designates certain genetic haplotypes that group most closely with coyotes as wolf, *C. lycaon*. There are several flaws with this hypothesis.

2. Existence of *C. lycaon* is Unnecessary to Explain the Data

First, the existence of a separate wolf species, *C. lycaon*, is not necessary to explain the observed data. Instead, the pattern of observed haplotypes can be more easily explained by hybridization between gray wolves, *C. lupus*, and coyotes, *C. latrans*.

Indeed, even researchers who *support* the existence of *C. lycaon* admit that they cannot rule out the possibility that what they refer to as *C. lycaon* is actually a reflection of past hybridization between coyotes and gray wolves (*C. lupus*). For example, Wheeldon et al. (2010), who argue that wolves and coyotes are not hybridizing in the Great Lakes area, state that they “cannot rule out the occurrence of historic hybridization between [Western Great Lakes Region] wolves and coyotes” (pg. 8). Similarly, Kyle et al. (2006) conclude, “[t]he hypothesis that eastern wolves are the result of *C. lupus/C. latrans* hybridization cannot be rejected by all of the molecular data.” As recently as last month, Brent Patterson, a co-author of Wheeldon et al. (2010) wrote, “[f]uture research might yet reveal that there never was a North American evolved Red wolf or Eastern wolf, and that these animals are indeed merely hybrids between *C. lupus* and *C. latrans*.” (Patterson, email communication) (attached). In short, despite some researchers’ conclusion that a separate wolf species, *C. lycaon*, exists, these authors cannot definitively distinguish between their conclusion and the conclusion that *C. lycaon* is not a species all, but a hybrid between gray wolves and coyotes.

Because the data are entirely consistent with the more parsimonious explanation that gray wolves (*C. lupus*) and coyotes (*C. latrans*) have periodically hybridized in this geographic region the Service should not take the drastic step of declaring a new species of wolf to exist in the Proposed Rule.

3. Additional Data Not Cited in the Proposed Rule Do Not Support the Existence of Two Wolf Species in the Great Lakes

Second, other researchers who have worked on this same issue have found no evidence to support the existence of a separate wolf species. Yet the Proposed Rule fails to note this fact or mistakenly conflates the findings of these researchers as supporting the Service's identification of a new species.

For example, the Proposed Rule relies on the conclusions of Leonard and Wayne (2007) and Koblmuller et al. (2009) to support the existence of a separate taxonomic wolf unit in the Great Lakes region, 76 Fed. Reg. at 26093. But these researchers disagree that a *C. lycaon* species or any other new wolf taxon exists. Leonard and Wayne (2007) and Koblmuller et al. (2009) believe that wolves in the Great Lakes are a distinguishable gray wolf (*C. lupus*) population with a history of hybridization with coyotes (*C. latrans*). This is distinctly different than Wilson et al. (2000), Kyle et al. (2006) and Wheeldon et al. (2010)'s conclusion that a separate coyote-like wolf species (*C. lycaon*) existed that has hybridized with gray wolves (*C. lupus*) in the Great Lakes. In fact, in direct response to the conclusion of a separate *C. lycaon* wolf species, Koblmuller et al. (2009) conclude:

We do not find evidence for a unique grouping of GL wolves in microsatellite, mtDNA or Y-chromosome analyses that would support the past presence of a unique species of wolf in the Great Lakes area (Wilson et al. 2000; Kyle et al. 2006).

They additionally conclude, "[Great Lakes] wolves *should be considered gray wolves*" (Koblmuller et al. 2009, pg. 2321) (emphasis added).

Other genetic studies of wolves in the western Great Lakes region, including the most extensive analysis of canid genomics ever conducted, have concluded that the wolves in this region represent a cohesive population of gray wolf, *C. lupus* (Leonard and Wayne 2007, Koblmuller et al. 2009, vonHoldt et al. 2011). While these authors recognize wolves in the Great Lakes as an ecotype or distinct population of gray wolves, these papers have *not* detected the presence of a second separate species of wolf – nor evidence for hybridization between two separate wolf species. Again, data from the research group that supports the *C. lycaon* hypothesis is also consistent with the conclusion that the Great Lakes population represents a single cohesive population rather than two distinct species and their hybrids. For example, Wheeldon et al. (2010) write, "[a]lthough the mtDNA and Y-chromosome data appear to indicate that nonhybridized gray wolves and eastern wolves exist in the WGLR..., our autosomal microsatellite data indicates that *they cluster in the same population.*" (emphasis added). This is highly significant because non-hybridized individuals cannot be



identified by mtDNA and Y-chromosome data alone since this type of DNA is inherited from a single parent. Autosomal microsatellite data, which are inherited bi-parentally, demonstrate a single cohesive population rather than the existence of two separate wolf species.

The Proposed Rule's reliance on mtDNA and Y-chromosome haplotypes to identify *C. lycaon* is extremely problematic, as these components could easily reflect past hybridization with coyotes rather than a more accurate representation of the individual's entire genome. A recent study examined North American canids at the genome level and was able to clearly distinguish the extent to which wolves in the Great Lakes and Northeast United States represent gray wolf versus coyote ancestry (vonHoldt et al. 2011). Again, while these authors recognize wolves in the Great Lakes as an ecotype or distinct population of gray wolves, this study did not reveal the presence of a second species of wolf – only introgression between gray wolves, *C. lupus* and coyotes, *C. latrans*.

For the purposes of the Service's review of the Proposed Rule, it must be emphasized that this issue is *not* simply a disagreement between whether the wolves in the Great Lakes region constitute a population, subspecies or species. These researchers have fundamentally different conclusions about the taxonomy of wolves in the Great Lakes. This fundamental disagreement stems from the fact that Wilson/Kyle/Wheeldon's conclusions hinge on a handful of genetic haplotypes that group with coyotes, but that they consider to be wolf (*C. lycaon*). The "coyote-like" haplotypes that Wilson/Kyle/Wheeldon refer to as *C. lycaon*, Leonard/Wayne/Koblmueller/vonHoldt interpret simply to be coyote. That is, while Leonard/Wayne/Koblmueller/vonHoldt et al. believe that gray wolves in the Great Lakes are a unique ecotype, they believe that gray wolves (*C. lupus*) and coyotes (*C. latrans*) (and their hybrids) are the only species-level canids from the genus *Canis* that exist in the United States. This is significant because it suggests that what the Service is recognizing as a distinct species of wolf is actually a gray wolf (*C. lupus*) that has hybridized with coyotes. In addition to possibly being scientifically inaccurate, the Service's conclusion affects wolves well outside the region of the proposed Great Lakes DPS in a way that would remove protections from wolves in the eastern United States due to an "erroneous" taxonomic reclassification. 76 Fed. Reg. at 26090.

#### 4. *C. lycaon* Is Not Identifiable

A third problem with the Service's proposed taxonomic reclassification is that it is not currently possible to identify *C. lycaon* in the wild. In fact, any so-called eastern wolf, *C. lycaon*, does not appear to be readily distinguishable in any way from individuals otherwise referred to as *C. lupus* in the Great Lakes and Northeast regions except by matching specific genetic profiles to a handful of selected 'coyote-like' haplotypes that are inherited from one parent and furthermore are not monophyletic (the mtDNA haplotypes that are used to identify *C. lycaon* do not form a single clade). Additionally, *C. lycaon* does not appear to be identifiable based on bi-parentally inherited genetic markers such as autosomal microsatellites and SNPs.

This is simply not a sufficient criterion for recognizing a species under any species concepts discussed in the Proposed Rule, 76 Fed. Reg. at 26091-92, including the biological species concept and the phylogenetic species concept (Avice 2004). Furthermore, researchers who support the existence of *C. lycaon* admit that hybridization of *C. lycaon* (if such species has ever existed) with *C. lupus* and *C. latrans* has been so extensive that “there are likely no remaining unhybridized eastern wolves in the wild” (Patterson, email communication). If there are no true representatives of the species in the wild that are identifiable either by morphology, geography or genetics, there seems to be no basis for the designation of a separate species.<sup>4</sup>

In short, the Service’s reliance on Leonard and Wayne (2007) and Koblmuller et al. (2009) to support the existence of *C. lycaon* as a separate wolf taxon represents a fundamental misunderstanding of the data and the disagreement between research groups working on this issue. Leonard/Wayne/Koblmuller/vonHoldt et al. believe that wolves in the Great Lakes region and the Northeast United States represent a population of gray wolves (*C. lupus*) with a history of hybridization with coyotes (*C. latrans*). They do *not* believe there is any scientific support for the existence of a separate species of coyote-like wolf, *C. lycaon*, as described by Wilson/Kyle/Wheeldon et al. Furthermore, what Wilson/Kyle/Wheeldon et al. describe as *C. lycaon* is distinctly different than what Leonard/Wayne/Koblmuller/vonHoldt et al. describe as a Great Lakes ecotype. To equate the two or use their differing conclusions to support the Service’s taxonomic revision is both inaccurate and unjustifiable. Finally, the existence of *C. lycaon* is highly questionable both historically and presently as researchers who support its existence cannot rule out the possibility that the ‘species’ is simply a hybrid between gray wolves, *C. lupus*, and coyotes, *C. latrans*; and they do not believe that there are any true representatives of the species currently in the wild.

Because we are not convinced that the data support the existence of a separate species, *C. lycaon*, we do not believe this taxonomic issue should have an effect on the Service’s proposal to delist a Great Lakes DPS. Accordingly, we also believe it is entirely premature, if not inappropriate, for the Service to propose to revise the geographic range and taxonomy of the gray wolf, *C. lupus*, as listed under the Endangered Species Act. As recent data has shown, the genetic signature of *C. lupus* has been present within the Northeast and Southeast United States including within the range of *C. rufus* (vonHoldt et al. 2011). The Service relies on other morphological

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<sup>4</sup> While the current mtDNA composition of wolves in the region does not appear to be identical to the historic population that occupied the area (Leonard and Wayne 2007), autosomal DNA seems to indicate only a slight change to the population, indicating a continuity in the genetic composition of wolves in the Great Lakes over time (Koblmuller et al. 2009). There is continuing research and debate over the extent of current hybridization with coyotes, but this hybridization appears to have occurred historically as well, indicating that it is a phenomenon that extends beyond human-mediated factors. Therefore, although we believe that research should continue to explore the historic origin of Great Lakes wolves and the extent and cause of hybridization between Great Lakes wolves and coyotes, we believe that these factors do not currently pose any complications to the proposal to recognize and delist the Great Lakes DPS.

evidence to support this revision; however, such evidence is not as reliable for species identification as genetic data (Wayne and Jenks, 1991, Roy et al., 1996). For example, this morphological data could easily be inconsistent with genetic identification of the same individual.

Given that genetic data suggest that *C. lupus* was present in many of the twenty-nine eastern states, we suggest the Service suspend this geographic revision of the *C. lupus* range until there is greater clarity on the historic range of the species and until there is greater clarity within the scientific community regarding the existence of *C. lycaon*. As described below, if the Service is compelled to proceed with amending the geographic range and taxonomy of *C. lupus*, we think this would be more appropriately addressed within the context of the species' 5- year review or, alternatively, in a separate rulemaking altogether. It is unnecessary for this complicated and controversial decision to be made in concert with the decision to delist the Great Lakes DPS.

B. The Proposed Reclassification Casts Doubt on the Service's Delisting Analysis for the Great Lakes DPS

It should also be noted that the Service's recognition of a new species of wolf, *C. lycaon*, occurring within the Great Lakes DPS would greatly (and, as described above, unnecessarily) complicate the proposed delisting.

On the one hand, the Proposed Rule asserts that *C. lupus* and *C. lycaon* are both present in the Midwest and that these two "species" interbreed. See 76 Fed. Reg. at 26094. Indeed, the Proposed Rule discusses hybridization of *C. lupus* and *C. lycaon* as a potential "threat" to the existence of the *C. lupus* DPS. Id. at 26139. Yet nowhere in the Proposed Rule does the Service actually estimate the number of *C. lupus* individuals (or breeding pairs) that are actually present in the Great Lakes DPS.<sup>5</sup>

This is particularly problematic because in much of the rest of the Proposed Rule the Service treats all wolves in the Great Lakes region as if they were gray wolves. For example, when describing "Recovery Trends for Wolves in the Western Great Lakes Region," the Proposed Rule discusses the total number of "wolves" in Minnesota, Wisconsin, and Michigan. See 76 Fed. Reg. at 26096-26100. In this portion of the Proposed Rule the Service repeatedly asserts, for example, that "[a]s of 1998 Minnesota wolves had reached approximately twice the number specified in the recovery planning goal for Minnesota." Id. at 26097. Similar language is present for all three states. See id. at 26098 ("[i]n 2002, wolf numbers in Wisconsin alone surpassed the 1992 Revised Recovery Plan criterion for a second population within 100 miles of the Minnesota population."); 26099 ("[s]ince that time, wolf packs have spread

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<sup>5</sup> The closest the Proposed Rule comes to such an estimate is to note that 66% of mtDNA samples of wolves in the region showed *C. lycaon* haplotypes and 50-54% of Y-chromosome samples showed these haplotypes. 76 Fed. Reg. at 26094. As discussed above, relying solely on mtDNA and Y-chromosome samples is inherently problematic. See, supra, p. 9. Regardless, the Proposed Rule never elucidates how the Service translates these studies into actual population estimates for *C. lupus* in the Great Lakes DPS.

throughout the UP.”). And, in summarizing wolf recovery in the Great Lakes, the Proposed Rule asserts that “[t]he wolf’s numeric and distributional recovery criteria in the [Western Great Lakes] have been met.” *Id.* at 26100. But, of course, if the Service’s taxonomic distinction between *C. lupus* and *C. lycaon* is to be taken seriously the number of “wolves” in the Great Lakes region is irrelevant. In assessing the recovery of the gray wolf in the Great Lakes the relevant metric is the population of *gray wolves*—not gray wolves plus another canid species. The Service can no more rest its proposed delisting of gray wolves on population estimates of *C. lupus* and *C. lycaon* than it could, for example, base a proposed delisting of red wolves (*C. rufus*) in the Southeast by combining red wolf and coyote (*C. latrans*) into a single population estimate.

To be clear, NRDC does not believe that, ultimately, this problem should prohibit the recognition and delisting of gray wolves in the Great Lakes because the scientific evidence does not support the recognition of *C. lycaon* as a species in the first place. The Proposed Rule’s treatment of the Great Lakes DPS would be far more defensible if the Service simply treated all wolves in the Great Lakes as constituting a distinct and significant population of gray wolves (indeed, the presence of unique haplotypes in this population would strengthen the case for recognizing a DPS).

In short, when viewed as a single species, the Service’s conclusion that a recovered DPS of gray wolves can be found in the Great Lakes region is well-supported and defensible. But when combined with an already tenuous identification of a new species of Eastern wolves mixed with that population it becomes far more problematic.

### **III. If the Service is Determined to Proceed with the Reclassification it Should, at a Minimum, Simultaneously Determine Whether to List *C. lycaon***

As discussed above, we do not believe that the best available science supports the Proposed Rule’s recognition of the existence of a new wolf species, *C. lycaon*, and the corresponding revision of the recognized historic range of the gray wolf, *C. lupus*.

However, if the Service proceeds with this reclassification and revision, it should at least maintain protections for *C. lupus* and *C. lycaon* during that process. Protecting these species throughout their historic range during the Service’s reconsideration will maintain the status quo and help ensure that *C. lycaon* is able to survive and recover. Both the Service and the National Marine Fisheries Service (NMFS) have protected species that were already listed during taxonomic reclassifications.

For example, in 2007 scientific information was published indicating that the flatwoods salamander, which had been listed as a threatened species since 1999, should actually be considered as two distinct species. Both of the newly recognized salamander species—the reticulated flatwoods salamander and the frosted flatwoods salamander—occupied the previously designated flatwoods salamander range. Responding to these studies, in 2008, the Service published a proposed rule to split the flatwoods salamander into two separate species. Proposed Endangered Status for Reticulated Flatwoods Salamander; Proposed Designation of Critical Habitat for Frosted Flatwoods Salamander and Reticulated Flatwoods Salamander, 73 Fed. Reg.

47258 (Aug. 13, 2008); Proposed Endangered Status for Reticulated Flatwoods Salamander; Proposed Designation of Critical Habitat for Frosted Flatwoods Salamander and Reticulated Flatwoods Salamander, 73 Fed. Reg. 54125-02 (Sept. 18, 2008).

Unlike the Proposed Rule here, however, the flatwood salamander proposal simultaneously assessed the status of both salamander species, proposing to maintain the frosted flatwoods salamander's threatened status, 73 Fed. Reg. at 54132, and to reclassify the reticulated flatwoods salamander as endangered, 73 Fed. Reg. at 47260. The final rule replaced the flatwood salamander's place on the threatened list with both the reticulated flatwoods salamander and the frosted flatwoods salamander. Determination of Endangered Status for Reticulated Flatwoods Salamander; Designation of Critical Habitat for Frosted Flatwoods Salamander and Reticulated Flatwoods Salamander, 74 Fed. Reg. 6700-01 (Feb. 10, 2009). Thus, the Service appropriately ensured that there was no "gap" during which either species lacked protections that might be warranted.

NMFS took a similar approach when revising the taxonomic status of the right whale. The right whale had been listed as a single endangered species since 1970, but in 2006, after reviewing a petition to separately list the North Pacific right whale as endangered, NMFS recognized that right whales in the northern hemisphere are two genetically distinct species. 71 Fed. Reg. 77694, 77698-77699 (Dec. 27, 2006). Because of this determination, NMFS was "requir[ed] . . . to consider these species separately for the purposes of listing under the ESA." *Id.* In the same proposed rule, NMFS reviewed the status of the North Pacific right whale, and published a second proposed rule that day to review the North Atlantic right whale's status. *Id.*; Endangered and Threatened Species; Proposed Endangered Status for North Atlantic Right Whales, 71 Fed. Reg. 77704-01 (Dec. 27, 2006). NMFS determined that both the North Pacific right whale and the North Atlantic right whale should be classified as endangered. 71 Fed. Reg. at 77703; 71 Fed. Reg. at 77714. In 2008, FWS published a final rule announcing that both North Pacific and North Atlantic right whales would be listed as endangered species. Endangered Status for North Pacific and North Atlantic Right Whales. 73 Fed. Reg. 12024-01, 12024 (Mar. 6, 2008).

Here, however, the Service has apparently taken a different approach. Rather than simultaneously determining whether *C. lycaon* merits protection under the ESA and, if so, simultaneously proposing to list them as either endangered or threatened, the Proposed Rule states:

With regard to *Canis lycaon* we are announcing a rangewide status review of this species...A determination as to whether to proceed with any *C. lycaon* listing action—and if listing is warranted, whether or not to include the northeastern United States in the listed range—will depend on the results of the status review. Notification of our intention with regard to *C. lycaon* will be provided in conjunction with publication of the *final rule for the WGL DPS*. Meanwhile, we propose to revise the range of the gray wolf (the species *C. lupus*) by removing all or parts of the 29 eastern states that we now recognize were not part of the historical range of the gray wolf.

76 Fed. Reg. at 26090.

At a minimum, the Service has created a situation where it may withdraw all protections for wolves (under the umbrella of *C. lupus*) in the Northeast while a proposal to list *C. lycaon* is pending, thus (absent an emergency listing) temporarily depriving wolves of all protections, even if the Service itself thinks they are warranted. At worst, the Service may conclude that listing *C. lycaon* is “warranted but precluded,” which would effectively deny wolves in the Northeast any federal protections indefinitely.

This approach is both unnecessary and not in the best interests of wolf conservation. If the Service delists *Canis lupus* in the East and proceeds with a status review for *Canis lycaon*, the Service should, at a minimum, ensure that its rulemaking maintains Endangered Species Act protections for wolves in the Northeast while conducting its status review and any rulemakings to list *Canis lycaon*.

#### **IV. Wolves in the East Should Remain Protected Under the Endangered Species Act in the East**

If the Service proceeds with reclassification and removes Endangered Species Act protections for *Canis lupus* in the East, the Service must list *Canis lycaon* as endangered under the Endangered Species Act to enable the recovery of wolves in the Northeast, where significant suitable wolf habitat still exists and dispersing wolves have recently been found.

Harrison and Chapin (1998) analyzed wolf habitat in the northeastern United States and found that tens of thousands of square kilometers of suitable, viable wolf habitat exist in the Northeast. They noted that the Service’s 1992 recovery plan for the eastern timber wolf “identified 24,287 km<sup>2</sup> in New York and 35,751 km<sup>2</sup> in Maine as areas that warranted further consideration as potential habitat for wolves, but those areas were not quantified and mapped.” As part of this study, the authors quantified and mapped the extent, distribution, and connectivity of potential habitat for wolves in the northeastern United States. The authors also mapped potential dispersal corridors between wolf populations in southeastern Canada and these areas.

For wolf habitat in the Northeast, Harrison and Chapin (1998) ultimately found:

The [Service’s] recovery plan considered potential wolf habitat in northwestern and eastern Maine as discreet areas; however, our analysis suggests that potential habitat is contiguous throughout northern, western, and eastern Maine, and extends well into northern New Hampshire. Contiguous core habitat in Maine and New Hampshire could likely support 488 - 1,951 wolves; . . . The Adirondack Mountains region of northern New York also represents a large, contiguous area (14,618 km<sup>2</sup>) of land meeting our criteria as potential core habitat for wolves. . . . New York would likely support 146 - 584 wolves. . . . [Finally,] [t]here is limited and widely scattered potential core (2,470 km<sup>2</sup>) and dispersal

(1,430 km<sup>2</sup>) habitat for wolves in Vermont. . . . Much of the limited habitat for wolves in Vermont occurs in the extreme northeastern portion of the state and is contiguous with an expansive area of suitable habitat in northern New Hampshire, Quebec, and Maine. That habitat could contribute incrementally to regional populations if wolves return to Maine and New Hampshire.

The analyses performed by Harrison and Chapin (1998) “were based on thresholds of road and human densities established for long-established wolf populations in Minnesota (Fuller et al. 1992)” and clearly show that the large swaths of contiguous wolf habitat needed to host a wolf population that will be viable over the long term are still present in the northeastern United States.

Furthermore, multiple wolves have been documented dispersing into the Northeast. In October 2007, a wolf was killed on a farm in Shelburne, Massachusetts, and in March 2008 Thomas J. Healy, head of the Service’s Northeast regional office, said that recent DNA tests at the Service’s Oregon labs confirmed it was a gray wolf with no indication it was ever held in captivity.<sup>6</sup> Additionally, two wolves were killed in Maine in 1993 and 1996.<sup>7</sup> The Maine Department of Inland Fisheries and Wildlife also notes that “[t]racks and other evidence suggest there may be additional wolf-like canids in the state, but there is no conclusive evidence of reproduction or establishment of packs.”<sup>8</sup> Other recent wolf sightings in the Northeast have also occurred.<sup>9</sup>

Given the fact that wolves are currently dispersing into the Northeast, as well as the documented presence of significant suitable habitat sufficient to support a breeding population of wolves, if the Service proceeds with its taxonomic reclassification of the gray wolf, it is vitally important that it maintain ESA protections for wolves in the Northeast while conducting its status review for *Canis lycaon* – and then list *Canis lycaon* as endangered under the ESA to enable the recovery of wolves in the Northeast.

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<sup>6</sup> Beth Daley, *First wolf found in Mass. in 160 years*, BOSTON GLOBE, Mar. 4, 2008, available at [http://www.boston.com/news/local/breaking\\_news/2008/03/first\\_wolf\\_foun.html](http://www.boston.com/news/local/breaking_news/2008/03/first_wolf_foun.html) (last visited June 29, 2011); Stephanie Reitz, Associated Press, *Rare Gray Wolf Appears in Western Massachusetts*, NATIONAL GEOGRAPHIC NEWS, Mar. 5, 2008, available at <http://news.nationalgeographic.com/news/2008/03/080305-AP-wolf-return.html> (last visited June 29, 2011).

<sup>7</sup> Maine Department of Inland Fisheries and Wildlife, available at [http://www.maine.gov/ifw/wildlife/species/endangered\\_species/gray\\_wolf](http://www.maine.gov/ifw/wildlife/species/endangered_species/gray_wolf) (last visited June 29, 2011); *Signs Suggest a Return Of Timber Wolf to Maine*, NEW YORK TIMES, Dec. 22, 1996, available at <http://www.nytimes.com/1996/12/22/us/signs-suggest-a-return-of-timber-wolf-to-maine.html> (last visited June 29, 2011).

<sup>8</sup> Maine Department of Inland Fisheries and Wildlife, available at [http://www.maine.gov/ifw/wildlife/species/endangered\\_species/gray\\_wolf](http://www.maine.gov/ifw/wildlife/species/endangered_species/gray_wolf) (last visited June 29, 2011).

<sup>9</sup> See January 31, 2009, Petition to Interior Secretary Salazar re: Northeast Wolf Recovery, available at <http://mainewolfcoalition.org/wp-content/uploads/2010/09/ESA-petition-2009-final.htm> (last visited June 29, 2011).

**V. If the Service Delists Wolves in the Lower-48, It Should Create a Pacific Northwest DPS and Protect that DPS under the Endangered Species Act**

The Proposed Rule states that “[t]he biological and conservation status of wolves in the Pacific Northwest is being assessed to determine their appropriate listing classification. When this review is completed, we will evaluate a potential Pacific Northwest DPS in accordance with our DPS policy and will reclassify this population as appropriate through an additional rulemaking process.” 76 Fed. Reg. at 26090. Because significant suitable wolf habitat exists in the Pacific Northwest and wolves currently inhabit parts of the Pacific Northwest, if the Service delists wolves in the lower-48, it should designate a broad Pacific Northwest DPS and protect that DPS under the ESA.

In determining whether to recognize a DPS, the Service examines two factors: the “discreteness” of the population and the population’s “significance” to the taxon as a whole. Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act, 61 Fed. Reg. 4722, (Feb. 7 1996); 76 Fed. Reg. at 26101. If a population meets both of those tests, it can be identified as a DPS. Id. Then, a third factor, the DPS’s conservation status, is evaluated in relation to the ESA’s standards for listing, delisting, or reclassification. Id. Here, the wolf population in the Pacific Northwest meets both the discrete and significance tests and its conservation status unquestionably merits an endangered listing under the ESA.

Pacific Northwest wolves constitute a discrete population. Carroll et al. (2006) noted that wolf habitat “is not distributed uniformly across the western United States” and that, among other regions, the “Pacific states . . . could serve as the basis for [a] DPS[] or multistate management coordination area[].” The habitat-suitability map created by Carroll et al. (2006) (Figure 2) clearly shows a significant north-south stretch of unsuitable habitat that separates the suitable wolf habitat in the Pacific Northwest from the Northern Rocky Mountains. Carroll et al. (2006) specifically noted that “[e]cological barriers, such as expanses of unsuitable habitat, are more appropriate for delineating DPSs than geographic divisions, such as state boundaries,” and the Service’s DPS policy explicitly states that “a population segment of a vertebrate taxon may be considered discrete if it . . . is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors.” 76 Fed. Reg. at 26102.

The Pacific Northwest wolf population is also significant because of its geography, the unique ecology of the region, the fact that the loss of this population would lead to a significant reduction in wolves’ range, and because the wolves currently occupying the region appear to be genetically different from wolves in the Northern Rocky Mountains or other regions.

Recent genetic data adds to both the discreteness and the significance of the Pacific Northwest wolf population. According to the Draft Wolf Conservation and Management Plan for Washington, genetic testing of the breeding male and female of the Lookout Pack in north-central Washington, the first confirmed pack in the Pacific Northwest in years, suggested they are partially descendants from wolves in coastal British



Columbia.<sup>10</sup> In their recent paper on a genome-wide perspective on the evolutionary history of enigmatic wolf-like canids, vonHoldt et al. (2011) found that “in the New World, Mexican wolves appear as the most genetically distinct group, . . . [but] [o]ther genetic partitions were defined in North America as well, including distinct populations on the British Columbian coast, Northern Quebec, and interior North America.” Pacific Northwest wolves may thus represent a genetically distinct population of gray wolf (a mixture of the Interior and British Columbia wolves) that is not found in other areas.

Clearly, the Pacific Northwest wolf population meets both the discrete and significance tests, and with wolves just recently beginning to return to the ample suitable wolf habitat in the region, the conservation status of the wolf population in the Pacific Northwest should certainly be listed as endangered under the ESA.

Finally, regarding the geographical scope of the Service’s review of wolves in the Pacific Northwest, the Proposed Rule states that it considers the Pacific Northwest to be the area “west of the [Northern Rocky Mountain] gray wolf population, including portions of Oregon, Washington, northern California, and western Nevada.” 76 Fed. Reg. at 26090. But in its May 2011 Gray Wolf Recovery Questions and Answers, the Service also includes “the Sierra Nevada Mountains” in its description of what the “appropriate geographic extent of the status review” should be.<sup>11</sup> The Service should include the Sierra Nevada Mountains in its designation of the Pacific Northwest and broadly construe the Pacific Northwest area. Carroll et al. (2006) analyzed and mapped “potential wolf habitat and population viability across the western contiguous United States, from the western edge of the Great Plains to the Pacific Ocean, an area of about 2,800,000 square kilometers (km<sup>2</sup>).” In their map of suitable wolf habitat in the West (Figure 2), Carroll et al. (2006) identified the Sierra Nevada Mountains as suitable wolf habitat. As such, and given the proximity of the Sierra Nevada Mountains to the Pacific Coast, these areas should be included with northern California, western Nevada, and those portions of Oregon and Washington west of the Northern Rocky Mountain DPS, in any designation of a Pacific Northwest DPS.

## **VI. Conclusion**

Today a healthy population of gray wolves exists in the Upper Midwest. The recovery of the population is a major conservation success and a credit to the Endangered Species Act and to the Service. NRDC believes that the time to delist these wolves has arrived. However, the manner in which the Service has gone about its proposed delisting of this population is troubling. Current scientific evidence does not support the recognition of a new species of wolf, *C. lycaon*. Moreover, it certainly does not support the Service’s proposal to withdraw all protections from wolves in the northeastern United States, which contain both dispersing wolves and large expanses of suitable

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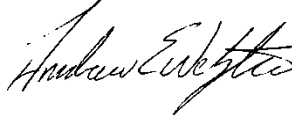
<sup>10</sup> Draft Wolf Conservation and Management Plan for Washington, p. 22, May 25, 2011, available at [http://wdfw.wa.gov/publications/00001/draft\\_wolf\\_plan\\_052311.pdf](http://wdfw.wa.gov/publications/00001/draft_wolf_plan_052311.pdf) (last visited June 29, 2011).

<sup>11</sup> (May 2011 Gray Wolf Recovery Questions and Answers, p. 12 available at [http://www.fws.gov/home/feature/2011/pdf/Wolf\\_Actions\\_FAQs.pdf](http://www.fws.gov/home/feature/2011/pdf/Wolf_Actions_FAQs.pdf) (last visited June 29, 2011).)

wolf habitat, while the Service conducts a status review of *C. lycaon*. Finally, the Service should recognize and list a Pacific Northwest gray wolf DPS to further advance the recovery of this endangered and crucial keystone species.

Thank you for considering these comments.

Very truly yours,

A handwritten signature in black ink, appearing to read "Andrew E. Wetzler". The signature is written in a cursive, flowing style.

Andrew E. Wetzler  
Director, Land & Wildlife Program

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From: Patterson, Brent (MNR) <brent.patterson@ontario.ca>  
To: Meril, Rick  
Sent: Wed May 25 12:13:46 2011  
Subject: RE: Fwd: FW: new canid genetics paper

Hi Rick,

**Tyler, Linda & I first heard Roland present these results at the Midwest wolf Stewards meeting in Wisconsin about a month ago and were certainly both interested and intrigued. While we remain open to rigorous testing of the ideas suggested by this work re the origins and taxonomy of eastern wolves (C. lycaon), we are not yet convinced and have concerns that impact the conclusions of vonHoldt et al. concerning the eastern wolf.**

One of our primary concerns is that the authors refer to eastern wolves and Great Lakes wolves interchangeably, and conduct their subsequent analyses based on this assumption. We must assume some of the blame for this confusion given suggestions in earlier works from this lab of a broad range for eastern wolves (e.g. Grewal et al. 2004; J. Mammalogy 85: 625-632), but in recent papers (e.g. Rutledge et al. 2010: Heredity 105: 520-531; Wheeldon et al. 2010: Molecular Ecology 19: 4428-4440) we tried to clarify that: 1) while there are likely no remaining unhybridized eastern wolves in the wild, the closest living relatives to the historic eastern wolf live in and immediately around Algonquin park in central Ontario. These wolves are distinct from wolves in NE and NW Ontario, as well as the Great Lakes States, and 2) Although wolves in the Great Lakes States and much of Ontario and Quebec contain some eastern wolf genetic material, they are not eastern wolves and both phenotypically and genetically (based on autosomal microsatellites) group more closely with Gray wolves, *C. lupus* than with *C. lycaon* (again, as typified by wolves in Algonquin). Given this, the finding that Great Lakes wolves and Red wolves did not share a common evolutionary origin is not surprising. We have suggested a common origin for Red wolves and Eastern wolves (again typified by, and largely restricted to wolves in Algonquin), NOT between Red wolves and the Great Lakes wolf which, as mentioned above, is a hybrid of *C. lupus* and *C. lycaon*.

**Given that VonHoldt et al. only analyzed DNA from 2 Algonquin wolves, and that we don't know when and exactly where these samples were collected (i.e. they could have been coyotes or hybrids collected somewhere in or around Algonquin), we don't believe that the hypothesis of eastern wolves as a distinct North American evolved species was adequately assessed by this work. Note also that the Wilson et al. (2000) canid evolutionary model (CJZ 78: 2156-2166) of the eastern wolf suggests divergence from the western coyote only 150-300K years ago. This time is barely sufficient to see differences in the mtDNA control region resulting from mutation, so the finding that genomic SNPs did not differentiate eastern wolves from western coyotes is not surprising. Another concern relates to the analyses conducted using the program Structure. Anyone familiar with this program, used to assign membership to different genetic groups, knows that it would be highly unlikely for any "population" consisting of only 2 individuals to separate as a distinct group from other larger populations. Nonetheless, it is interesting that the PCA conducted by VonHoldt et al. (see their Fig. 3) places the 2 Algonquin samples separate from all other groups although the authors arbitrarily grouped them with Great Lakes wolves.**

**Future research might yet reveal that there never was a North American evolved Red wolf or Eastern wolf, and that these animals are indeed merely hybrids between *C. lupus* and *C. latrans*, but if so we wonder how the following lines of evidence supporting a North American evolved wolf distinct from the Gray wolf will be rectified:**

- 1) Hybridization between eastern wolves/ red wolves and coyotes is pervasive where they are sympatric in eastern North America but hybridization between wolves and coyotes remains exceedingly rare or absent in the west. Hybridization between wolves and coyotes is also very rare across the Western Great Lakes region (see Wheeldon et al. paper cited above), and in northern Ontario (east and west). The range of ratios of abundance of wolves: coyotes vary widely in both eastern and western North America so saying the 2 species only hybridized in the east because of skewed species ratios requires quite a leap of faith.
- 2) How does one explain the presence of mitochondrial haplotypes C3 and C13 (see Rutledge and Wheeldon refs cited above); both of which are common in eastern wolves and their associated hybrids, but neither of which are found in non-hybridizing wolves or coyotes (i.e. gray wolves and western coyotes).
- 3) Evidence of a separate Y-chromosome eastern wolf lineage (Wilson et al., manuscript in review).

**In summary, while we agree that the approaches employed by VonHoldt et al. represent an important step forward re analysis of canid taxonomy; until a more representative and balanced sample containing eastern wolves (i.e. Algonquin wolves), historic pre-Columbian eastern wolf samples, and the appropriate out groups, is similarly analyzed we consider the hypothesis of a North American evolved wolf independent of the gray wolf still viable.**

Cheers,

Brent

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From: Bradley White <bradley.white@sympatico.ca>  
To: Meril, Rick  
Sent: Sun May 22 14:27:52 2011  
Subject: RE: Fwd: FW: new canid genetics paper  
Hi Rick:

We still interpret the data such that the eastern/red wolf are distinct but closely related species to the western coyote. Wayne et al are still making interpretations about coyote /gray wolf hybridization to support the original Wayne suggestion that the red wolf was formed a hybrid. The Biology is clear; coyotes and gray wolves do not hybridise. The gray/eastern hybrids do not hybridize with either eastern or western coyotes. Coy wolves or eastern coyotes have little to no gray wolf material.

Brad

From: Ron Nowak <ron4nowak@cs.com>

To: Meril, Rick

Sent: Sun May 22 11:24:25 2011

Subject: Re: new canid genetics paper

Rick---it's just more of the same; the paper is filled with questionable material and conclusions. And as long as there is another major team of geneticists taking a diametrically opposite view, I cannot accept the validity of that whole approach---Ron

Visit <http://coyotes-wolves-cougars.blogspot.com/>