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## Recent Developments

### The Big Bad Wolf Hybrid: How Molecular Genetics Research May Undermine Protection for Gray Wolves under the Endangered Species Act

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The gray wolf has made substantial progress towards recovery since first receiving protection under the Endangered Species Act (ESA) thirty years ago.<sup>1</sup> But the wolf now faces a new and unlikely threat. Molecular genetics research suggests that gray wolves have hybridized with coyotes in the northeastern United States.<sup>2</sup> The federal agency charged with protecting endangered and threatened plants and animals, the United States Fish and Wildlife Service (FWS), has used evidence of hybridization to help justify a proposal to abandon gray wolf recovery in the northeastern United States.<sup>3</sup> Even though a recent federal court ruling has derailed this proposal, the future for wolves in the northeastern United States remains uncertain.

Federal protection for the gray wolf has changed dramatically over the last thirty years. This change is due to the ability of the FWS to list a species, subspecies, or distinct population segment for protection under the ESA.<sup>4</sup> The original listing in 1974 protected two subspecies of gray wolf,<sup>5</sup>

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1. Removing the Eastern Distinct Population Segment of the Gray Wolf From the List of Endangered and Threatened Wildlife, 69 Fed. Reg. 43,664, 43,668-73 (proposed July 21, 2004).

2. *Id.* at 43,671-72.

3. *Id.* at 43,672.

4. Endangered Species Act, 16 U.S.C. § 1532(16) (2000). Listing under the ESA prompts extensive federal protection for the species. The killing of an endangered species is illegal and comes with stiff penalties. *See id.* § 1540.

5. *See* Final Rule To Reclassify and Remove the Gray Wolf From the List

with two additional subspecies added in 1976.<sup>6</sup> In 1978, FWS changed to a species-level listing, protecting gray wolves as an endangered species across the conterminous forty-eight states and Mexico, with the exception of Minnesota, where the species was downlisted to threatened status.<sup>7</sup> In April 2003, FWS changed the classification of the gray wolf, creating three distinct population segments (DPSs): Southwestern, Western, and Eastern.<sup>8</sup> FWS downlisted the wolf to threatened status in the Western and Eastern DPSs, retaining endangered status only for the Southwestern DPS.<sup>9</sup> The 2003 decision prompted sharp criticism from wolf advocates, who argued that federal wolf recovery efforts are needed in additional portions of the country, including the northeastern United States.<sup>10</sup> Coalitions of environmental and humane organizations challenged the 2003 decision in federal court.<sup>11</sup>

Even though the legal battle over the 2003 decision was ongoing, in July 2004 FWS proposed to completely remove the Eastern DPS of gray wolves from the list of protected species<sup>12</sup> The Eastern DPS covers twenty-one states and spans most of the eastern United States, excluding only the southeastern

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of Endangered and Threatened Wildlife in Portions of the Conterminous United States, 68 Fed. Reg. 15,804, 15,806 (Apr. 1, 2003).

6. Determination That Two Species of Butterflies Are Threatened Species and Two Species of Mammals Are Endangered Species, 41 Fed. Reg. 17,736, 17,740 (Apr. 28, 1976); Endangered Status for 159 Taxa of Animals, 41 Fed. Reg. 24,062, 24,066 (June 14, 1976).

7. Reclassification of the Gray Wolf in the United States and Mexico, with Determination of Critical Habitat in Michigan and Minnesota, 43 Fed. Reg. 9607 (Mar. 9, 1978); *see also* Final Rule To Reclassify and Remove the Gray Wolf From the List of Endangered and Threatened Wildlife in Portions of the Conterminous United States, 68 Fed. Reg. at 15,806.

8. Final Rule To Reclassify and Remove the Gray Wolf From the List of Endangered and Threatened Wildlife in Portions of the Conterminous United States, 68 Fed. Reg. at 15,818.

9. *Id.* at 15,857-62.

10. *See, e.g.*, Press Release, Defenders of Wildlife, Defenders Initiates Legal Steps to Keep Gray Wolf Recovery on Track (Apr. 1, 2003), at <http://www.defenders.org/releases/ind2003/html>; Andrew C. Revkin, *Rules on Gray Wolf May Soon Ease*, N.Y. TIMES, July 3, 2000, at A10.

11. *See* U.S. Fish and Wildlife Service, *Gray Wolf Recovery Status Reports* (June 26, 2004) (describing litigation brought by Defenders of Wildlife and others in the District Court of Oregon and by National Wildlife Federation and others in the District Court of Vermont), at <http://www.r6.fws.gov/wolf/wk07022004.htm> (last visited Apr. 24, 2005).

12. Removing the Eastern Distinct Population Segment of the Gray Wolf from the List of Endangered and Threatened Wildlife, 69 Fed. Reg. 43,664 (proposed July 21, 2004).

United States.<sup>13</sup> FWS estimates that over 3,000 wolves occupy the Eastern DPS, with nearly all of these wolves in Minnesota, Wisconsin, and Michigan.<sup>14</sup> Wolf advocates have objected to delisting in large part because the gray wolf has not recovered in the northeastern United States.<sup>15</sup> FWS has confirmed only a few scattered individual wolves in that region.<sup>16</sup> Although the gray wolf has not recovered in the northeastern United States, FWS has argued that gray wolf recovery in the Western Great Lakes Region satisfies its recovery obligations for the entire Eastern DPS.<sup>17</sup>

Environmental organizations have urged FWS to designate a separate Northeastern DPS.<sup>18</sup> Although FWS ultimately designated one large Eastern DPS, FWS proposed in 2000 to instead designate two smaller DPSs: Western Great Lakes and Northeastern.<sup>19</sup> This approach would have allowed FWS to downlist or delist the Western Great Lakes DPS, where wolves have made recovery progress, while retaining endangered status for wolves in the northeastern United States. The proposal advanced by FWS to delist the entire Eastern DPS lumped the northeastern United States with the Western Great Lakes region and foreclosed federal wolf recovery efforts in the northeastern United States.

On January 31, 2005, a federal judge in the District of Oregon sided with environmental and humane organizations and vacated FWS's 2003 decision to create three DPSs and

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13. Final Rule To Reclassify and Remove the Gray Wolf From the List of Endangered and Threatened Wildlife in Portions of the Conterminous United States, 68 Fed. Reg. at 15,818.

14. U.S. FISH AND WILDLIFE SERVICE, GRAY WOLF POPULATION IN THE UNITED STATES, at [www.fws.gov/midwest/wolf/population/status-map.htm](http://www.fws.gov/midwest/wolf/population/status-map.htm) (last visited Feb. 4, 2005).

15. See, e.g., Defenders of Wildlife, *Wolf Hearing Scheduled in Maine*, BULL. OF WOLF COUNCIL (Aug. 20, 2004), available at <http://www.defenders.org/wildlife/wolf/wolfupdate/issues/wl100404.html>.

16. Removing the Eastern Distinct Population Segment of the Gray Wolf From the List of Endangered and Threatened Wildlife, 69 Fed. Reg. at 43,671-72.

17. *Id.* at 43,672.

18. DEFENDERS OF WILDLIFE, SIERRA CLUB, RESTORE: THE NORTH WOODS, & THE WILDLANDS PROJECT, PETITION TO LIST A DISTINCT POPULATION OF GRAY WOLVES GENERALLY RECOGNIZED AS THE NORTHEASTERN UNITED STATES (Apr. 1, 2003), available at <http://www.defenders.org/wildlife/new/> (last visited Apr. 24, 2005).

19. Proposal To Reclassify and Remove the Gray Wolf From the List of Endangered and Threatened Wildlife in Portions of the Conterminous United States; 65 Fed. Reg. 43,450, 43,472-73 (proposed July 13, 2000).

downlist wolves in the Eastern and Western DPS.<sup>20</sup> The judge held that wolf recovery in core areas in the Western Great Lakes and Northern Rockies cannot be used to justify downlisting the large areas encompassed by the Western and Eastern DPSs.<sup>21</sup> The judge further determined that FWS failed to use sound biological principles when delineating the DPSs and rather used the DPSs to create a framework for illegally downlisting and ultimately delisting these large geographical areas.<sup>22</sup>

As a consequence of this court ruling, the wolf reverts back to its 1978 listing status until FWS finalizes a new listing rule or successfully appeals. The court ruling also means FWS cannot move ahead with its proposal to delist the Eastern DPS (because the ruling vacated the DPSs), and wolf advocates have renewed hope that FWS will initiate federal wolf recovery in the northeastern United States. The future for wolves in the northeastern United States, however, remains an open question.

FWS's decision to abandon federal recovery of wolves in the northeastern United States was motivated in part by recent molecular genetics research that questions the genetic identity of wolves in that region.<sup>23</sup> FWS has argued that it could not finalize a Northeast DPS because it has not confirmed that gray wolf populations exist in the region.<sup>24</sup> Wolf advocacy organizations have compiled numerous sightings of wolf-like canids in the northeastern United States over the last ten years, but FWS has refused to verify these as gray wolf sightings.<sup>25</sup> FWS suggests that these animals could be large coyotes, domestic dogs, or wolf hybrids.<sup>26</sup>

Molecular genetics testing of remains or salvages of wolf-

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20. *Defenders of Wildlife v. Norton*, No. 03-1348-JO (D. Or., Jan. 31, 2005).

21. *Id.* at slip op. 21.

22. *Id.* at slip op. 30.

23. *See* Final Rule To Reclassify and Remove the Gray Wolf From the List of Endangered and Threatened Wildlife in Portions of the Conterminous United States, 68 Fed. Reg. 15,804, 15,805, 15,836 (Apr. 1, 2003).

24. *Id.* at 15,836.

25. *See id.*; Removing the Eastern Distinct Population Segment of the Gray Wolf From the List of Endangered and Threatened Wildlife, 69 Fed. Reg. at 43,672 (proposed July 21, 2004).

26. Removing the Eastern Distinct Population Segment of the Gray Wolf From the List of Endangered and Threatened Wildlife; 69 Fed. Reg. at 43,671-72.

like canids from the northeastern United States have detected the presence of wolf hybrids.<sup>27</sup> For example, in 1996, an eighty-six pound male wolf-like canid was killed in Maine.<sup>28</sup> Genetic analysis conducted by a Canadian geneticist concluded that the canid was a wolf-coyote hybrid.<sup>29</sup> Similarly, in 1997, a seventy-two pound wolf-like canid was shot in Vermont.<sup>30</sup> FWS sent samples to three labs for genetic analysis.<sup>31</sup> Although the labs obtained inconsistent results, FWS concluded that the wolf was likely of hybrid origin.<sup>32</sup>

In the past, morphological characteristics were used to detect hybrid individuals, based on the assumption that hybrids are phenotypically intermediate to parent individuals.<sup>33</sup> However, this is often not the case.<sup>34</sup> The use of molecular genetic markers has simplified detection of hybrids,<sup>35</sup> beginning in the 1960's with protein electrophoresis.<sup>36</sup> Hybrids can be detected by the presence of alleles diagnostic for wolves and the hybridizing taxon at diagnostic loci.<sup>37</sup> Development of the polymerase chain reaction (PCR) and other recent advances in molecular techniques have increased the number of loci available for detection of hybrids.<sup>38</sup>

Although molecular genetics has facilitated the detection of hybrids, there is no easy answer as to whether hybrids should be protected under the ESA. Hybridization makes it difficult to define the appropriate unit for conservation efforts.<sup>39</sup> Early interpretations by FWS concluded that hybrids should receive no protection under the ESA.<sup>40</sup> Biologists criticized the policy

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27. *Id.*

28. *Id.* at 43,672.

29. *Id.*

30. *Id.*

31. *Id.*

32. Removing the Eastern Distinct Population Segment of the Gray Wolf From the List of Endangered and Threatened Wildlife; 69 Fed. Reg. at 43,672.

33. Fred W. Allendorf et al., *The Problems with Hybrids: Setting Conservation Guidelines*, 16 TRENDS IN ECOLOGY & EVOLUTION 613, 614 (2001).

34. *Id.*

35. Fred W. Allendorf et al., *Intercrosses and the U.S. Endangered Species Act: Should Hybridized Populations Be Included as Westslope Cutthroat Trout?*, 18 CONSERVATION BIOLOGY 1203, 1206 (2004).

36. *Id.*

37. *Id.*

38. *Id.*

39. *Id.* at 1204.

40. Proposed Policy and Proposed Rule on the Treatment of Intercrosses

as too rigid,<sup>41</sup> and FWS decided to withdraw the policy in December 1990.<sup>42</sup> FWS developed a proposed rule on management of hybrids in February 1996.<sup>43</sup> This policy would have protected hybrids when they have traits that characterize the listed parent and more closely resemble the listed parent's taxon than an intermediate entity.<sup>44</sup> The 1996 policy was never finalized, however, and FWS withdrew it in February 2001.<sup>45</sup>

In the absence of a general hybrid policy, FWS has stated that wolf-dog hybrids will be given no protection under the ESA.<sup>46</sup> FWS has no official position on gray wolf-coyote hybrids, but FWS's refusal to designate a Northeast DPS of gray wolves may indicate that the agency believes the wolf-coyote hybrids do not warrant protection.<sup>47</sup> Indeed, opponents to wolf protection have tried to utilize evidence of hybridization to argue that wolf conservation efforts are not warranted.<sup>48</sup> FWS received and considered petitions to delist the gray wolf and red wolf when molecular genetics analysis indicated evidence of coyote genes in these populations.<sup>49</sup> FWS denied

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and Intercross Progeny (the Issue of "Hybridization"), 61 Fed. Reg. 4710 (proposed Feb. 7, 1996).

41. See, e.g., Stephen J. O'Brien & Ernst Mayr, *Bureaucratic Mischief: Recognizing Endangered Species and Subspecies*, 251 SCIENCE 1187, 1188 (1991).

42. Proposed Policy and Proposed Rule on the Treatment of Intercrosses and Intercross Progeny (the Issue of "Hybridization"), 61 Fed. Reg. at 4710.

43. *Id.*

44. *Id.* at 4711.

45. Dep't of the Interior, Semiannual Regulatory Agenda, 66 Fed. Reg. 25,509, 25,566 (May 14, 2001).

46. Removing the Eastern Distinct Population Segment of the Gray Wolf From the List of Endangered and Threatened Wildlife, 69 Fed. Reg. 43,664, 43,665 (proposed July 21, 2004).

47. A similar issue has risen with the red wolf in southeastern United States. Molecular genetic analysis of red wolves has led some scientists to believe that the red wolf is actually a hybrid of gray wolves and coyotes. Allendorf et al., *supra* note 33, at 619. While some scientists dispute a hybrid origin for the red wolf, much of the debate has centered on whether the hybridization was historical or recent. See, e.g., R.M. Nowak & N.E. Federoff, *Validity of the Red Wolf: Response to Roy et al.*, 12 CONSERVATION BIOLOGY 722 (1998); Allendorf et al., *supra* note 34, at 619. If the hybridization was historical, then most agree that the red wolf is an ancient component of the ecosystem worthy of protection. Allendorf et al., *supra* note 34, at 619.

48. Ron Nowak, *Hybridization: The Double-edged Threat*, 3 CANID NEWS 1 (1995), at <http://www.canids.org/PUBLICAT/CNDNEWS3/hybridiz.htm>.

49. *Id.*

both petitions.<sup>50</sup>

The value of hybrids likely varies with each situation. Hybrids can be a threat to some listed species.<sup>51</sup> Wolf advocates acknowledge that the near disappearance of the red wolf was caused by genetic swamping from interbreeding with coyotes over the last hundred years.<sup>52</sup> On the other hand, hybridization can play an important role in restoring genetic variation to populations that have lost variation due to genetic drift or inbreeding depression.<sup>53</sup> Another consideration is the size of the non-hybridized population – the conservation value of a hybridized population increases when the non-hybridized population is small, especially if the hybrids can help fill the ecological role of the struggling non-hybridized population.<sup>54</sup>

The question of how FWS will treat hybrid individuals in the future remains unanswered. FWS is faced with a situation in which its policy has not kept up with technological advances in detecting hybrids. Nevertheless, development of a general hybrid policy may not be an appropriate goal. Each situation is unique and general rules are unlikely to be effective.<sup>55</sup>

As for wolves in the northeastern United States, FWS has been forced to act in the midst of scientific uncertainty.<sup>56</sup> Given

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50. Finding on a Petition to Delist the Red Wolf (*Canis rufus*), 57 Fed. Reg. 1246 (Jan. 13, 1992); Notice of Finding on a Petition to Delist the Gray Wolf (*Canis lupus*), 55 Fed. Reg. 49,656 (Nov. 30, 1990).

51. J.M. Rhymer & D. Simberloff, *Extinction by Hybridization and Introgression*, 27 ANN. REV. ECOLOGY AND SYSTEMATICS 83 *passim* (1996).

52. Nowak, *supra* note 48, at 2. As another example, conservation biologists have concluded that the listed western cutthroat trout has reduced fitness when it hybridizes with rainbow trout. Allendorf et al., *supra* note 35, at 1209.

53. Allendorf et al., *supra* note 35, at 1211; Sharon Guynup, *The mating game: ligers, zorses, wolphins, and other hybrid animals raise a beastly science question: what is a species?*, 59 SCI. WORLD, Jan. 4, 2003, at 12 (explaining how FWS used hybridization with the Texas cougar to add genetic variability to the Florida panther), available at [http://www.findarticles.com/p/articles/mi\\_m1590/is\\_8\\_59/](http://www.findarticles.com/p/articles/mi_m1590/is_8_59/) (last visited Apr. 24, 2005).

54. Allendorf et al., *supra* note 35, at 1211.

55. *Id.*

56. Scientific uncertainty regarding the genetic identity of wolves currently occupying the northeastern United States has been compounded by molecular genetics research suggesting that gray wolves were not the historical occupant of the region. For decades, wolf biologists have believed that a gray wolf subspecies, *Canis lupus lycaon*, historically occupied northeastern United States. Removing the Eastern Distinct Population Segment of the Gray Wolf From the List of Endangered and Threatened Wildlife; 69 Fed. Reg. 43,664, 43,665 (proposed July 21, 2004). A recent



the limited funds that FWS has available for conservation, an argument can be made that additional federal wolf recovery efforts in the northeastern United States could not be justified.<sup>57</sup> But the removal of federal protection in the region is dangerous because it may lead to extirpation of wolves with a unique genetic identity. Preserving and protecting genetic diversity is a core purpose of the ESA.<sup>58</sup> When making decisions in the midst of scientific uncertainty, FWS best fulfills the purposes of the ESA by giving the benefit of the doubt to the species.<sup>59</sup>

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molecular genetics study, however, suggests that northeastern United States was historically occupied by a separate species, a form of the red wolf. *Id.* FWS acknowledges that wolf systematics is evolving, however, and states that it is taking no final position on the historical identity of wolves in the northeastern United States. *Id.* at 43,666.

57. Robert K. Wayne, *On the Use of Morphologic and Molecular Genetic Characters to Investigate Species Status*, 6 CONSERVATION BIOLOGY 590, 592 (1992).

58. *T.V.A. v. Hill*, 437 U.S. 153, 178 (1978) (“*The value of this genetic heritage is, quite literally, incalculable . . . . From the most narrow possible point of view, it is in the best interests of mankind to minimize the losses of genetic variations.*”) (quoting H. R. REP. NO. 93-412, at 4-5 (1973) (alteration in original)).

59. H.R. CONF. REP. NO. 96-697 (1979), *reprinted in* 1979 U.S.C.C.A.N. 2572, 2576; *see Conner v. Burford*, 848 F.2d 1441, 1454 (9th Cir. 1988).