

THE DESIGNATION OF “DISTINCT POPULATION SEGMENTS”  
UNDER THE ENDANGERED SPECIES ACT IN LIGHT OF *NATIONAL  
ASSOCIATION OF HOMEBUILDERS V. NORTON*

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INTRODUCTION

The United States Fish and Wildlife Service (“FWS”) first noticed that the cactus ferruginous pygmy-owl (“cactus pygmy-owl”) population was declining in 1989.<sup>1</sup> In response to this decline, the FWS placed the cactus pygmy-owl on the candidate list<sup>2</sup> of endangered or threatened species. The FWS has identified the loss of riparian habitat as one of the major causes of the decline of the cactus pygmy-owl.<sup>3</sup> This habitat loss is attributed to, among other things, “urban and agricultural encroachment.”<sup>4</sup> Much of Arizona is experiencing rapid population growth and development in areas of suitable habitat for the cactus pygmy-owl.<sup>5</sup>

After the cactus pygmy-owl was placed on the candidate list, a field biologist at the FWS prepared a report recommending that the cactus pygmy-owl be listed as either endangered<sup>6</sup> or threatened.<sup>7</sup> After preparing

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1. Determination of Endangered Status for the Cactus Ferruginous Pygmy-Owl in Arizona, 62 Fed. Reg. 10,730, 10,731 (Mar. 10, 1997).

2. The FWS and the National Marine Fisheries Service (“NMFS” or collectively, “the Agencies”) place species on a “candidate list” once they have determined that the species might be threatened or endangered while they are deciding the status of the species. A species is often placed on the candidate list after a listing petition is received by one of the Agencies.

3. *Id.* at 10,740.

4. *Id.*

5. *Id.* at 10,741.

6. Under the Endangered Species Act, a species is considered endangered when it “is in danger of extinction throughout all or a significant portion of its range.” 16 U.S.C. § 1532(6) (2000).

7. Email from Kieran Suckling, Policy Director, Southwest Center for Biological Diversity, to Katherine Hausrath, Summer Law Clerk, Earthjustice (June 30, 2004) (on file with author) [hereinafter Suckling Email II]. A species is considered threatened if it is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. 16 U.S.C. § 1532(20).

the report, however, the biologist was discouraged from continuing with the full listing of the cactus pygmy-owl.<sup>8</sup>

After learning of the FWS's reluctance to list the cactus pygmy-owl, the Center for Biological Diversity ("CBD") extensively reviewed all of the published and unpublished scientific studies on cactus pygmy-owl biology and distribution from the nineteenth century to the present.<sup>9</sup> The CBD also conducted field surveys of the areas where cactus pygmy-owls were known to exist in the past in order to gather accurate figures regarding the distribution of the cactus pygmy-owl.<sup>10</sup> In 1992, the CBD used this information to compile a listing petition<sup>11</sup> under the Endangered Species Act ("ESA") for the cactus pygmy-owl.<sup>12</sup>

Despite the extensive scientific information contained in the listing petition, the FWS did not actually list the cactus pygmy-owl as endangered until 1997.<sup>13</sup> The FWS concluded that the Arizona population ("Arizona cactus pygmy-owl") warranted listing as endangered, while new information indicated that listing the cactus pygmy-owl in Texas was not warranted.<sup>14</sup> The FWS therefore listed the Arizona cactus pygmy-owl population under the provision of the ESA that permits the listing of a "distinct population segment" ("DPS") of vertebrate fish or wildlife species.<sup>15</sup>

The FWS did not designate "critical habitat" for the cactus pygmy-owl until 1999,<sup>16</sup> and only in response to a lawsuit filed in October 1997.<sup>17</sup> The ESA requires the FWS to designate critical habitat for a species when it is listed.<sup>18</sup> Critical habitat refers to geographic areas that are essential to the

8. Email from Kieran Suckling, Policy Director, Southwest Center for Biological Diversity, to Katherine Hausrath, Summer Law Clerk, Earthjustice (June 12, 2004) (on file with author) [hereinafter Suckling Email I].

9. Suckling Email II, *supra* note 7.

10. *Id.*

11. "Listing" consists of placing a species on an actual list of endangered or threatened species. 16 U.S.C. § 1533(c). Every species of animal and plant, except pest insects such as mosquitoes, is eligible for listing. *Id.* § 1532(6). Currently, 1,855 species, subspecies, and DPSs are listed under the ESA, of which 1,290 are U.S. species. United States Fish and Wildlife Service, *Summary of Listed Species: Species and Recovery Plans as of 10/15/2004*, at [http://ecos.fws.gov/tess\\_public/TESSBoxscore](http://ecos.fws.gov/tess_public/TESSBoxscore) (last visited Jan. 16, 2005). See *infra* note 130 for an explanation for why the United States is able to list species in other countries.

12. Suckling Email I, *supra* note 8.

13. Determination of Endangered Status for the Cactus Ferruginous Pygmy-Owl in Arizona, 62 Fed. Reg. 10,730, 10,730 (Mar. 10, 1997).

14. *Id.*

15. 16 U.S.C. § 1532(16).

16. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Cactus Ferruginous Pygmy-Owl (*Glaucidium brasilianum cactorum*), 64 Fed. Reg. 37,419, 37,419 (July 12, 1999).

17. *Id.* at 37,420.

18. 16 U.S.C. § 1533(b)(5)(C).

conservation of the species.<sup>19</sup> After a species is listed, the ESA protects both the species itself and the critical habitat on which the species depends.<sup>20</sup>

Once a species is listed, the ESA comprehensively protects the species. The ESA prohibits killing, harming, or otherwise taking a species, even if the species occurs on private land.<sup>21</sup> The same protection is afforded to a DPS as a listed species, even if the rest of the population of the species is healthy.<sup>22</sup> In the listing petition, the FWS noted that they were aware of five new housing and development projects that would affect habitat where most of Arizona pygmy-owls existed at the time of listing.<sup>23</sup> The existence of the cactus pygmy-owl effectively barred the development of the subdivisions. Because of the restrictions on the use of the land that a DPS designation can entail, the question of whether a particular population is truly "distinct" from other populations of the species is often litigated. If a landowner is able to obtain a court decision finding that a listed population is not a DPS, the landowner will not be subject to any restrictions on use of the land as a result of a species' listing.

The term DPS has no defined scientific meaning; when Congress amended the ESA to allow the listing of a DPS, it left the problem of defining the term to the appropriate agencies.<sup>24</sup> In response to litigation regarding the meaning of DPS, the FWS and the National Marine Fisheries Service ("NMFS" and collectively, the "Agencies") jointly promulgated a policy for the listing of DPSs ("Joint Policy").<sup>25</sup> The Joint Policy uses a two-part test to determine whether a population of a species qualifies as a DPS under the ESA. To be eligible for listing as a DPS, the population

19. Specifically, critical habitat is defined as:

(i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with [the ESA], on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and

(ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions [of the ESA], upon a determination by the Secretary that such areas are essential for the conservation of the species.

*Id.* § 1532(5)(A).

20. *Id.*

21. United States Fish & Wildlife Service, *Our Endangered Species Program and How It Works With Landowners*, at <http://endangered.fws.gov/landowner/landown.pdf> (last visited Jan. 17, 2005).

22. 16 U.S.C. § 1532(16).

23. Determination of Endangered Status for the Cactus Ferruginous Pygmy-Owl in Arizona, 62 Fed. Reg. 10,730, 10,741 (Mar. 10, 1997).

24. Draft Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act; Request for Public Comment, 59 Fed. Reg. 65,884, 65,884 (Dec. 21, 1994).

25. Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act, 61 Fed. Reg. 4,722, 4,725 (Feb. 7, 1996).

must be (1) discrete and (2) significant.<sup>26</sup> It is only after an agency has determined that the population is a DPS that the listing agency decides whether the DPS is threatened or endangered.<sup>27</sup> Despite the existence of this policy, the Agencies have failed to apply the Joint Policy consistently, and this has resulted in judicial reversal of DPS listing decisions.

In *National Association of Homebuilders v. Norton*, the Homebuilders and others sued the FWS in district court, alleging that the decision to list the Arizona pygmy-owl was “arbitrary and capricious”<sup>28</sup> because the Arizona pygmy-owl was not truly distinct from the rest of the species.<sup>29</sup> The court upheld the listing, and the Homebuilders appealed the decision to the Ninth Circuit. The Ninth Circuit reversed and held that the Arizona pygmy-owl was not a DPS under the FWS’s own Joint Policy, because the population segment was not significant.<sup>30</sup> The court therefore determined that the FWS acted arbitrarily and capriciously in designating the Arizona pygmy-owl population as a DPS under the Joint Policy.<sup>31</sup>

*Homebuilders* clearly illustrates the problems with the current method for designating DPSs. These problems include inconsistent listing decisions and the failure to list populations of species that require ESA protection. In order to more accurately identify DPSs and avoid similar judicial reversals of listing decisions, the Agencies should amend their Joint Policy to reflect the prevailing view of scientists in the field. In addition, the courts should adopt a precautionary principle in order to afford the Agencies greater latitude to protect DPSs. Both of these changes would lead to more consistent results in DPS listing decisions and fulfill the mandates and purposes of the

26. Draft Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act; Request for Public Comment, 59 Fed. Reg. at 65,884–85.

27. *Id.*

28. The Administrative Procedures Act outlines the standard of review that a court must use in reviewing an agency action. The statute states in relevant part “[t]he reviewing court shall . . . hold unlawful and set aside agency action, findings, and conclusions found to be . . . *arbitrary, capricious*, an abuse of discretion, or otherwise not in accordance with law.” 5 U.S.C. § 706 (2000) (emphasis added). The Supreme Court held that a decision will be considered “arbitrary and capricious” if the agency:

has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise.

*Motor Vehicle Mfrs. Ass’n v. State Farm Mut. Auto Ins. Co.*, 463 U.S. 29, 43 (1983). A court only may use the administrative record in order to review an agency decision. *Camp v. Pitts*, 411 U.S. 138, 142 (1973). The court’s role is to make sure that the agency’s decision is based on appropriate factors and is not a “clear error of judgment.” *Motor Vehicle Mfrs. Ass’n*, 463 U.S. at 43.

29. *Nat’l Ass’n of Homebuilders v. Norton*, No. CIV-00-0903-PHX-SRB, 2001 U.S. Dist. LEXIS 24817, at \*11 (Sept. 19, 2001).

30. *Nat’l Ass’n of Homebuilders v. Norton*, 340 F.3d 835, 838 (9th Cir. 2003).

31. *Id.*

ESA by ensuring the proper protection of endangered and threatened species.

This Comment will analyze the *Homebuilders* decision, as well as other Agency DPS listing decisions, and advance a standard for the designation of DPSs that should be used by the Agencies and the courts in the future. Part I will briefly review the scientific definition of "species," the ESA, and the amendment to the ESA allowing for the listing of DPSs. Part II will analyze the Joint Policy, including the history of the Joint Policy, the substantive provisions of the Joint Policy, and the application of the Joint Policy to DPS listing decisions. Part III will analyze the Arizona District Court and Ninth Circuit holdings in *Homebuilders*. Part IV will argue for (1) a simplified "Evolutionary Unit" rule for listing DPSs, (2) a minimum viable population requirement for DPS listings, (3) a uniform standard of proof for the Agencies to require when listing DPSs, and (4) a "precautionary principle" for the courts to follow when analyzing DPS listing decisions. Part IV also will apply the proposed standard to the *Homebuilders* case to illustrate the application of the new policy.

## I. THE ENDANGERED SPECIES ACT

### A. *What is a Species?*

Scientists have put forth two competing theories regarding the definition of a species. Species have traditionally been defined using the biological species concept.<sup>32</sup> The biological species concept identifies a species by its reproductive isolation from other members of the species.<sup>33</sup> This theory centers on the idea of whether the different members of the species can interbreed with one another. Only those members of the species that are incapable of interbreeding can constitute a unique biological species.

The second theory regarding the definition of species is the phylogenetic species theory.<sup>34</sup> Under this concept, species are defined as distinctive units that have a "unique evolutionary role or trajectory."<sup>35</sup> Basically, species are defined by how they have evolved and not by whether they can

32. American Museum of Natural History, *What is a "Species?"*, at <http://research.amnh.org/ornithology/crossbills/species.html> (last visited Jan. 17, 2005) [hereinafter American Museum of Natural History].

33. NAT'L RESEARCH COUNCIL, SCIENCE AND THE ENDANGERED SPECIES ACT 41 (1995), available at <http://books.nap.edu/books/0309052912/html/index.html> [hereinafter NAT'L RESEARCH COUNCIL].

34. *Id.* at 42; American Museum of Natural History, *supra* note 32.

35. NAT'L RESEARCH COUNCIL, *supra* note 33, at 42.

interbreed. The phylogenetic theory states that identifiable geographic forms of the same basic type of animal—or populations of the animal that are separated geographically—should be considered different species.<sup>36</sup>

### B. *The Provisions of the ESA*

Congress enacted the Endangered Species Act in 1973 in response to concerns about the decline and extinction of species around the world.<sup>37</sup> The ESA's purpose is to conserve and recover "listed" species as well as the ecosystems on which these species depend.<sup>38</sup> The ESA authorizes the Secretaries of Interior and Commerce to list species, and the Secretaries have delegated their listing authority to the FWS and the NMFS respectively.<sup>39</sup> The FWS is responsible for listing terrestrial and freshwater species, while the NMFS is responsible for listing marine species.<sup>40</sup>

The ESA is "the most comprehensive legislation for the preservation of endangered species ever enacted by any nation."<sup>41</sup> Presently, 1,855 species, subspecies, and DPSs are listed under the ESA, of which 1,290 are U.S. species.<sup>42</sup> Congress enacted the ESA based on the finding that many species in the United States had become extinct due to economic growth and development, and other species had been so depleted that they were in danger of extinction.<sup>43</sup> The ESA directs the FWS and NMFS to promulgate rules to protect endangered or threatened species.<sup>44</sup> The Agencies must base their listing decisions on the best available scientific and commercial data.<sup>45</sup>

A species is considered endangered when it "is in danger of extinction throughout all or a significant portion of its range."<sup>46</sup> A species is considered threatened if it is likely to become endangered throughout all or a significant portion of its range within the foreseeable future.<sup>47</sup> The ESA requires the Agencies to list a species if one or more of the following five

36. *Id.*

37. Endangered Species Act of 1973, Pub. L. No. 93-205, 87 Stat. 884.

38. *Id.* § 1531(b).

39. 50 C.F.R. § 402.01(b) (2003).

40. National Marine Fisheries Service, *Endangered Species Act (ESA) of 1973*, at <http://www.nmfs.noaa.gov/pr/laws/esa.htm> (last visited Jan. 17, 2005).

41. *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 180 (1978).

42. *See supra* note 11. *See infra* note 130 for an explanation for why the United States is able to list species in other countries.

43. 16 U.S.C. § 1531(a).

44. *Id.* § 1533(h).

45. *Id.* § 1533(b)(1)(A).

46. *Id.* § 1532(6).

47. *Id.* § 1532(20).

factors is met: (1) the present or threatened destruction, modification, or curtailment of the species' habitat or range; (2) overutilization of the species for commercial, recreational, scientific, or educational purposes; (3) disease or predation of the species; (4) the inadequacy of existing regulatory mechanisms to protect the species; or (5) other natural or manmade factors affecting the continued existence of the species.<sup>48</sup>

After a species is listed, the listing Agency must take affirmative steps to recover the listed species from its endangered or threatened status.<sup>49</sup> One of the first actions that the Agency must take is to designate "critical habitat" that will be protected along with the listed species.<sup>50</sup> Critical habitat is meant to include those lands that are in need of immediate intervention or those lands that need to be protected in order to avoid the immediate extinction of the species.<sup>51</sup> Once the critical habitat is designated, the ESA requires the Agencies to take additional measures to manage and protect both the species and its critical habitat.<sup>52</sup>

### C. *The ESA Amendment Allowing the Listing of DPSs*

In 1978, Congress amended the ESA to allow for the listing of DPSs.<sup>53</sup> The original version of the ESA included within the definition of species "any subspecies of fish or wildlife or plants and any other group of fish or wildlife of the same species or smaller taxa in common spatial arrangement that interbreed when mature."<sup>54</sup> The 1978 amendment retained subspecies within the definition of species but eliminated the reference to "taxa in common spatial arrangement."<sup>55</sup> Instead, the amendment added to the definition any "distinct population segment of any species of vertebrate fish or wildlife."<sup>56</sup>

Congress restricted the listing of DPSs to vertebrates because of the controversy surrounding the protection of noncharismatic<sup>57</sup> populations and

48. *Id.* § 1533(a)(1).

49. *Id.* § 1533(f).

50. *Id.* § 1533(b)(6)(C).

51. *Id.* § 1532(5)(A).

52. *Id.* § 1533(f).

53. Endangered Species Act Amendments of 1978, Pub. L. No. 95-632, 92 Stat. 3751; *see also* Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act, 61 Fed. Reg. 4,722, 4,722 (Feb. 7, 1996) (citing 16 U.S.C. § 1532(16)).

54. *Id.*

55. *Id.*

56. *Id.*

57. Charismatic refers to high-profile endangered or threatened species that attract broad public concern, such as pandas or whales. David Suzuki, *Science Matters* (Jan. 25, 2002), at [http://www.davidsuzuki.-org/About\\_us/Dr\\_David\\_Suzuki/Article\\_Archives/weekly01250201.asp](http://www.davidsuzuki.-org/About_us/Dr_David_Suzuki/Article_Archives/weekly01250201.asp).

species at the time the amendment was enacted in 1978.<sup>58</sup> The cost and impracticality of protecting DPSs of insect species was also a factor in the decision to restrict the listing of DPSs to vertebrate species.<sup>59</sup> Congress directed the Agencies to list DPSs “sparingly and only when the biological evidence indicates that such action is warranted.”<sup>60</sup> Congress did not define the term DPS; instead, Congress delegated that responsibility to the Agencies.<sup>61</sup> According to the Supreme Court, Congress delegated this power to the Agencies because “[t]he task of defining and listing endangered and threatened species requires an expertise and attention to detail that exceeds the normal province of Congress.”<sup>62</sup>

## II. THE AGENCIES’ JOINT POLICY ON DISTINCT POPULATION SEGMENTS

### A. *Prior DPS Policy*

Before the current Joint Policy was created, the Agencies formulated a policy on DPSs that was never finalized; this prior policy was withdrawn for unknown reasons.<sup>63</sup> Although this previous policy was never enacted as a final rule, many of its elements are similar to those of the present Joint Policy. Because the rationale behind the promulgation of the current policy is unclear, the development of the former policy provides useful background analysis.

The FWS formulated the previous policy by holding a workshop in June 1990 to develop a practical definition of a DPS.<sup>64</sup> Biologists with genetics and population dynamics backgrounds, as well as representatives from the FWS, the NMFS, and academia participated in the conference.<sup>65</sup> The contributors agreed that genetic data should not be required to identify DPSs because of the difficulty in understanding and interpreting such

58. Email from Holly Doremus, Professor, University of California at Davis School of Law, to Dan Tarlock, Professor, Chicago-Kent College of Law (Mar. 25, 2004).

59. *Id.*

60. Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act, 61 Fed. Reg. 4,722, 4,722 (Feb. 7, 1996) (citing S. REP. NO. 96-151, at 7 (1979)).

61. Draft Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act; Request for Public Comment, 59 Fed. Reg. 65,884, 65,884 (Dec. 21, 1994).

62. *Babbitt v. Sweet Home Chapter of Communities for a Great Or.*, 515 U.S. 687, 708 (1995).

63. Department of the Interior, Semiannual Agenda of Rules Scheduled for Review or Development, 57 Fed. Reg. 51,442, 51,472 (Nov. 3, 1992).

64. *Maine v. Norton*, 257 F. Supp. 2d 357, 378 (D. Me. 2003) (citing DPS Policy Administrative Record, at 38–50 (minutes of meeting)).

65. *Id.*

data.<sup>66</sup> Rather, the conference members discussed the benefits of other types of data, including morphological data,<sup>67</sup> for identifying DPSs.<sup>68</sup> One research paper that was presented stated that morphology may be a sign of adaptation to local environmental conditions and may actually be better than genetic data for identifying characteristics worth conserving.<sup>69</sup>

After the June 1990 workshop, the FWS prepared a draft proposal that would have defined the term "vertebrate population."<sup>70</sup> The proposed rule noted that each of the common methods used for analyzing taxonomic differences—morphological, behavioral, and biochemical differences—had limitations.<sup>71</sup> The Agencies also recognized that near-total isolation of a population is central to the concept of a DPS. The FWS stated:

The limitations on gene flow created by this isolation could have the long-term effect of allowing a certain degree of genetic distance to form between the population and other members of the same taxon. Local mutations that favor the population in the isolated portion of its range may develop and survive in that population alone.<sup>72</sup>

However, the Agencies stated that *complete and total* isolation of a population is rare and not required for a DPS.<sup>73</sup> The draft proposal also considered the consequences of the extinction of an isolated population. The Agencies determined that extinction of an isolated biological unit is "irreversible because it involves the permanent loss of genetic resources capable of regenerating that unit."<sup>74</sup> Additionally, the impact of this extinction is exacerbated by the fact that it is unlikely neighboring populations would be able to repopulate the extinct population's range within a reasonable amount of time.<sup>75</sup> For unspecified reasons, the Agencies withdrew the draft proposed rule and eventually issued the current Joint Policy standard.<sup>76</sup>

66. *Id.*

67. Morphology is defined as the "form and structure, as of an organism, regarded as a whole." WEBSTER'S NEW WORLD COLLEGE DICTIONARY 938 (4th ed. 2000).

68. *Maine v. Norton*, 257 F. Supp. 2d at 378–79.

69. *Id.*

70. *Id.* at 379.

71. *Id.*

72. *Id.* (citing DPS Policy Administrative Record at 110–11).

73. *Id.*

74. *Id.*

75. *Id.*

76. *Id.*

### B. Provisions of the Current Joint Policy

The current Joint Policy uses a two-part analysis to identify a DPS. The Agency must establish (1) that the population is discrete and (2) that the population is significant.<sup>77</sup> Once the Agency has identified a population that is both discrete and significant, the Agency must then determine whether the DPS is threatened or endangered according to the criteria outlined in the ESA.<sup>78</sup>

The Agencies list several purposes for promulgating the Joint Policy. First, the ability to list, delist, or reclassify DPSs allows the Agencies to protect a threatened or endangered population of the species before the whole species is threatened.<sup>79</sup> Second, the policy allows the Agencies to address species' decline in a timelier and more cost-effective manner.<sup>80</sup> Finally, the policy allows the Agencies to address local issues more effectively.<sup>81</sup>

The Joint Policy outlines two criteria for finding that a population is discrete.<sup>82</sup> These criteria are disjunctive; if either of these criteria is satisfied, the Agency may find that the population is discrete.<sup>83</sup> First, a population is discrete if it "is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors. Quantitative measures of genetic or morphological discontinuity may provide evidence of this separation."<sup>84</sup> Second, a population is discrete if it "is delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist."<sup>85</sup>

If an Agency finds that a population is discrete according to one of the above criteria, the Agency will then look at the population's biological and ecological significance.<sup>86</sup> In determining whether a population is significant to its taxon, the Agencies may consider four nonexclusive factors. First, the Agency must analyze whether the DPS persists in an "ecological

77. Draft Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act; Request for Public Comment, 59 Fed. Reg. 65,884, 65,884–85 (Dec. 21, 1994).

78. *Id.* at 65,885. *See supra* text accompanying note 48 for the factors.

79. *Id.*

80. *Id.*

81. *Id.*

82. *Id.*

83. *Id.*

84. *Id.*

85. *Id.*

86. *Id.*

setting unusual or unique for the taxon.”<sup>87</sup> Second, the Agency must decide if there is any “[e]vidence that loss of the discrete population segment would result in a significant gap in the range of a taxon.”<sup>88</sup> Third, the Agency must consider any “[e]vidence that the discrete population segment represents the only surviving natural occurrence of a taxon that may be more abundant as an introduced population outside its historic range.”<sup>89</sup> Finally, the Agency must look at any “[e]vidence that the discrete population segment differs markedly from other populations of the species in its genetic characteristics.”<sup>90</sup>

The Joint Policy notes that these criteria should be evaluated in a manner consistent with Congress’ directive that DPSs listings should be used “sparingly.”<sup>91</sup> However, the Agencies point out that this significance determination is in line with Congress’ intention to encourage “the conservation of genetic diversity.”<sup>92</sup> In order to ensure that a population is truly significant to the taxon to which it belongs, the Joint Policy directs the Agencies to consider all available scientific evidence. The Joint Policy notes that the Agencies could list different DPSs of the same taxon differently.<sup>93</sup> In other words, one population of the species could be listed as endangered, while another population might be listed as threatened or not listed at all under the ESA.

### C. *An Analysis of the Agencies’ Application of the Joint Policy*

The Agencies have published seventeen final rules listing or delisting DPSs since the Joint Policy was published in 1996.<sup>94</sup> An analysis of the final rules implementing the Agencies’ Joint Policy reveals that the Agencies do not consistently apply the factors as outlined in the Joint Policy.<sup>95</sup>

The Agencies mainly use geographical separation to prove discreteness.<sup>96</sup> Fourteen of the seventeen final rules relied entirely or in part on

87. *Id.*

88. *Id.*

89. *Id.*

90. *Id.*

91. *Id.* at 65,884.

92. *Id.* at 65,885.

93. *Id.*

94. A rule is considered final after the Agency has given the public a chance to comment on the proposed rule and has published the rule in the Federal Register. 5 U.S.C. § 553 (2000).

95. In order to analyze the final listing rules, I conducted a search in the Federal Register database on the Lexis-Nexis online legal research system. I searched for final rules that contained the phrase “distinct population segment” within a paragraph of the Joint Policy, 61 Fed. Reg. 4,722 (Feb. 7, 1996). I set the date parameters to cover the time period from February 7, 1996, to August 16, 2004. February 7, 1996, is the date the Joint Policy was published.

96. See tables *infra* for this and the following data.

geographical separation to prove discreteness.<sup>97</sup> Genetic differences and the international border criteria are used less often. Nine of the seventeen final rules applying the Joint Policy also have relied in whole or part on genetic research to establish discreteness. Eight of the seventeen final rules applying the Joint Policy have relied in whole or part on international boundaries to show discreteness.

The Agencies depend primarily on the gap the loss of a DPS would create in the range of a taxon when deciding whether a population is significant. Twelve of the seventeen final rules regarding DPSs utilized the “significant gap” factor in whole or part to prove significance. The Agencies use the “genetic difference” factor to a lesser extent. The Agencies relied on evidence that the discrete population segment differed markedly in its genetic characteristics in only nine listing decisions.

The Agencies rarely use the other remaining factors to prove significance. The Agencies found significance based on a species representing the only surviving natural occurrence of a taxon in only one DPS listing decision. Four of the seventeen final rules proved significance in whole or part by finding that the DPS persisted in an unusual or unique ecological setting. The following tables outline the factors used by the Agencies in the seventeen final rules that the Agencies have promulgated since the Joint Policy was created:<sup>98</sup>

97. Because the Agencies generally used more than one factor to prove discreteness and significance in the listing decisions, the following analyses will add up to more than the seventeen published final rules.

98. Final Rule To Remove the Douglas County Distinct Population Segment of Columbian White-Tailed Deer From the Federal List of Endangered and Threatened Wildlife, 68 Fed. Reg. 43,647, 43,649 (July 24, 2003); Final Endangered Status for a Distinct Population Segment of Smalltooth Sawfish (*Pristis pectinata*) in the United States, 68 Fed. Reg. 15,674, 15,675–76 (Apr. 1, 2003); Final Rule To Reclassify and Remove the Gray Wolf From the List of Endangered and Threatened Wildlife in Portions of the Conterminous United States; Establishment of Two Special Regulations for Threatened Gray Wolves, 68 Fed. Reg. 15,804, 15,819 (Apr. 1, 2003); Final Rule to List the Columbia Basin Distinct Population Segment of the Pygmy Rabbit (*Brachylagus idahoensis*) as Endangered, 68 Fed. Reg. 10,388, 10,395 (Mar. 5, 2003); Reclassification of Certain Vicuña Populations From Endangered to Threatened With a Special Rule, 67 Fed. Reg. 37,695, 37,715 (May 30, 2002) (unclear from the listing rule what factor the FWS used to find that the DPS is significant); Final Rule To List the Mississippi Gopher Frog Distinct Population Segment of Dusky Gopher Frog as Endangered, 66 Fed. Reg. 62,993, 62,995 (Dec. 4, 2001); Final Endangered Status for a Distinct Population Segment of Anadromous Atlantic Salmon (*Salmo salar*) in the Gulf of Maine, 65 Fed. Reg. 69,459, 69,460 (Nov. 17, 2000); Determination of Threatened Status for the Contiguous U.S. Distinct Population Segment of the Canada Lynx and Related Rule, 65 Fed. Reg. 16,052, 16,060 (Mar. 24, 2000); Final Rule To List the Sierra Nevada Distinct Population Segment of the California Bighorn Sheep as Endangered, 65 Fed. Reg. 20, 22 (Jan. 3, 2000); Determination of Threatened Status for the Jarbidge River Population Segment of Bull Trout, 64 Fed. Reg. 17,110, 17,112–13 (Apr. 8, 1999); Final Rule to List the Arkansas River Basin Population of the Arkansas River Shiner (*Notropis girardi*) as Threatened, 63 Fed. Reg. 64,772, 64,774 (Nov. 23, 1998); Determination of Threatened Status for the Klamath River and Columbia River Distinct Population Segments of Bull Trout, 63 Fed. Reg. 31,647, 31,650 (June 10, 1998); Endangered Status for the Peninsular Ranges Population Segment of the Desert Bighorn Sheep in

**TABLE 1** Discrete

DPS	Geographic Separation	Genetic Difference	International Border
White-Tailed Deer	X	X	
Smalltooth Sawfish			X
Gray Wolf	X		X
Pygmy Rabbit	X	X	
Gopher Frog	X		
Atlantic Salmon	X	X	X
California Tiger Salamander	X	X	
Canada Lynx	X		X
Klamath and Columbia River Bull Trout	X	X	X
California Bighorn Sheep	X	X	
Jarbridge Bull Trout	X		
Arkansas River Shiner	X		
Desert Bighorn Sheep	X	X	X
Steller Sea Lion		X	
Arizona Pygmy-Owl	X	X	X
Copperbelly Water Snake	X		
Vicuña			X

Southern California, 63 Fed. Reg. 13,134, 13,136 (Mar. 18, 1998); Change in Listing Status of Steller Sea Lions Under the Endangered Species Act, 62 Fed. Reg. 24,345, 24,349–50 (May 5, 1997); Determination of Endangered Status for the Cactus Ferruginous Pygmy-Owl in Arizona, 62 Fed. Reg. 10,730, 10,731 (Mar. 10, 1997); Determination of Threatened Status for the Northern Population of the Copperbelly Water Snake, 62 Fed. Reg. 4,183, 4,184 (Jan. 29, 1997); Listing of the Central California Distinct Population Segment of the California Tiger Salamander; Reclassification of the Sonoma County and Santa Barbara County Distinct Populations from Endangered to Threatened; Special Rule, 68 Fed. Reg. 28,648, 28,652 (May 23, 2003). The FWS has since published a final rule listing all of the California Tiger Salamander populations as threatened. *See* Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the California Tiger Salamander; and Special Rule Exemption for Existing Routine Ranching Activities, 69 Fed. Reg. 47,212, 47,212 (Aug. 4, 2004). However, the final rule still refers to the three different DPSs, so the analysis of the factors relied on is currently relevant.

**TABLE 2** Significance

DPS	Gap	Genetic Difference	Only Natural Member Taxon	Unique Habitat
White-Tailed Deer	X	X		
Smalltooth Sawfish	X			
Gray Wolf	X	X		
Pygmy Rabbit		X		X
Gopher Frog		X		
Atlantic Salmon	X	X		
California Tiger Salamander	X	X		
Canada Lynx				X
Klamath and Columbia River Bull Trout	X	X		
California Bighorn Sheep	X	X		
Jarbridge Bull Trout				X
Arkansas River Shiner			X	
Desert Bighorn Sheep	X	X		X
Steller Sea Lion	X			
Arizona Pygmy-Owl	X			
Copperbelly Water Snake	X			
Vicuña	X			

1. The Agencies have required varying levels of evidence in order to prove geographic isolation.

While geographic isolation is clearly an important factor to consider in identifying a DPS, the Agencies' listing decisions vary greatly in the amount of evidence required to determine geographic isolation. Out of the seventeen final rules regarding DPSs, fourteen of the rules used geographic isolation to wholly or partially prove discreteness. An examination of the Agencies' final rules reveals inconsistencies in the evidence utilized to establish geographic isolation of a population. The listing decisions vary vastly; some decisions clearly outline the number of miles or geographic features that separate the DPSs, while other decisions simply state that the DPS are geographically separated without providing additional information.

In a decision to remove the Columbia River DPS of white-tailed deer from the list of threatened and endangered species, the FWS partially relied

on geographical isolation as evidence of discreteness.<sup>99</sup> The listing decision states that the population of white-tailed deer exists in two locations: along the Columbia River in Washington and Oregon, and in Douglas County, Oregon.<sup>100</sup> The two identified populations are separated by over 200 miles of mainly unsuitable habitat.<sup>101</sup> This listing is just one example of a situation where the FWS has relied on an area of unsuitable habitat to prove geographic isolation.<sup>102</sup>

In a decision to list a DPS of tiger salamanders and to reclassify other DPSs of the tiger salamander, the FWS also partially relied on geographic isolation.<sup>103</sup> The DPS at issue was separated from the nearest members of its populations by a mountain range, a river, and straits.<sup>104</sup> These geographic features comprised a gap of about forty-five miles.<sup>105</sup> A state Agency was quoted as stating that there had been no known records of the tiger salamander in the intervening areas.<sup>106</sup> Two mountain ranges and a plain separated the other two populations of the tiger salamander.<sup>107</sup> The listing decision did not mention the actual distance in miles of this geographic separation.<sup>108</sup> In defining a DPS of the dusky gopher frog, the FWS did outline the specific number of miles and geographic features that separate the DPS from the rest of the population.<sup>109</sup>

In other listing decisions, the FWS has relied on less data to conclude that a DPS is geographically isolated from the rest of the species. In at least one case, the FWS found that a population is geographically separated

99. Final Rule To Remove the Douglas County Distinct Population Segment of Columbian White-Tailed Deer From the Federal List of Endangered and Threatened Wildlife, 68 Fed. Reg. at 43,649.

100. *Id.*

101. *Id.*

102. The FWS relied on the existence of a 180-mile area of unsuitable habitat to identify a DPS of the copperbelly snake. Determination of Threatened Status for the Northern Population of the Copperbelly Water Snake, 62 Fed. Reg. at 4,184. This gap exists between the populations of copperbelly snakes in Michigan, Ohio, and northeastern Indiana, and the rest of the copperbelly snakes in southern Indiana, Kentucky, and Illinois. *Id.* The FWS relied on a study that looked at historical and more recent known locations for the snake to conclude that the lack of habitat made copperbelly water snake movement though this 180-mile gap extremely unlikely. *Id.*

103. Listing of the Central California Distinct Population Segment of the California Tiger Salamander; Reclassification of the Sonoma County and Santa Barbara County Distinct Populations From Endangered to Threatened; Special Rule, 68 Fed. Reg. at 28,652.

104. *Id.*

105. *Id.*

106. *Id.* (citing Interview with D. Warenycia, Cal. Dep't of Fish & Game (2002)).

107. *Id.*

108. *Id.*

109. In a decision that used geographical isolation alone to prove discreteness, the FWS relied on the fact that the DPS of dusky gopher frog was separated by 125 miles of unoccupied habitat and the Mobile River delta from the rest of the species. Final Rule To List the Mississippi Gopher Frog Distinct Population Segment of Dusky Gopher Frog as Endangered, 66 Fed. Reg. 62,993, 62,995 (Dec. 4, 2001).

without explicitly stating the current location of other populations of the species. In a final rule to list the Columbia Basin DPS of the pygmy rabbit, the FWS stated that the “Columbia Basin pygmy rabbit has been physically discrete from the remainder of the taxon for several millennia.”<sup>110</sup> Fossil records show that the Columbia Basin pygmy rabbits have been “disjunct” from the rest of the species’ range since the Holocene, or for the last 7,000–10,000 years.<sup>111</sup> The FWS stated that there are approximately thirty Columbia Basin pygmy rabbits remaining in Douglas County, but they did not address the location of the nearest pygmy rabbit population.<sup>112</sup>

Finally, the FWS has found that a population is geographically separated without advancing any actual proof of the separation. In a final rule to list the Peninsular Ranges DPS of desert bighorn sheep, the FWS simply stated conclusively that the DPS is “geographically isolated and separate” from other populations.<sup>113</sup> As these listing decisions demonstrate, the Agencies have used vastly different levels of proof to establish geographic isolation.

2. The Agencies rely on the lack of genetic exchange to distinguish a DPS.

The Agencies have incorporated the concept of genetic exchange<sup>114</sup> into their analysis of the discreteness of DPSs. In a final rule listing a DPS of the California bighorn sheep as endangered, the FWS noted that “gene flow” no longer occurred between the bighorn sheep populations in the Sierra Nevada.<sup>115</sup> In a description of the discreteness of the Columbian white-tailed deer DPS, the FWS stated that large genetic differences between the two white-tailed deer populations indicated a lack of “gene flow.”<sup>116</sup> When the FWS listed the Mississippi dusky gopher frog as a DPS, the FWS used the fact that a population of gopher frogs was separated from other gopher frogs by 125 miles of unoccupied habitat, as well

110. Final Rule to List the Columbia Basin Distinct Population Segment of the Pygmy Rabbit (*Brachylagus idahoensis*) as Endangered, 68 Fed. Reg. 10,388, 10,395 (Mar. 5, 2003).

111. *Id.* at 10,391.

112. *Id.* at 10,393.

113. Endangered Status for the Peninsular Ranges Population Segment of the Desert Bighorn Sheep in Southern California, 63 Fed. Reg. 13,134, 13,136 (Mar. 18, 1998).

114. Genetic exchange or genetic mixing refers to the question of whether members of one population of species breed with members of another population. If two populations do not exchange genetic material, it is more likely that the two populations already are, or will become, genetically distinct.

115. Final Rule To List the Sierra Nevada Distinct Population Segment of the California Bighorn Sheep as Endangered, 65 Fed. Reg. 20, 22 (Jan. 3, 2000).

116. Final Rule To Remove the Douglas County Distinct Population Segment of Columbian White-Tailed Deer From the Federal List of Endangered and Threatened Wildlife, 68 Fed. Reg. 43,647, 43,649 (July 24, 2003).

as the Mobile River delta, to prove that the DPS does not "mix" with other populations of gopher frogs.<sup>117</sup> These listing decisions show that the Agencies have implicitly adopted the lack of genetic exchange, or "gene flow," as an important factor for identifying DPSs.

III. THE NINTH CIRCUIT HELD THAT THE ARIZONA PYGMY-OWL WAS NOT SIGNIFICANT IN *HOMEBUILDERS*.

A. *The Arizona Pygmy-Owl and the FWS's Listing Rule*

The cactus pygmy-owl is one of four subspecies of the ferruginous pygmy-owl.<sup>118</sup> The cactus pygmy-owl's habitat stretches from Arizona south into the Mexican states of Colima and Michoacan, and from southern Texas south into the Mexican states of Tamaulipas and Nuevo Leon.<sup>119</sup> The cactus pygmy-owl was first described as a subspecies in 1937.<sup>120</sup> Since then, numerous scientific authorities have recognized the cactus pygmy-owl as a subspecies.<sup>121</sup> Based on this evidence, the FWS accepted the cactus pygmy-owl as a separate subspecies in 1991.<sup>122</sup>

The FWS has identified four separate populations of the cactus pygmy-owl: eastern Mexico, western Mexico, eastern United States (Texas), and western United States (Arizona).<sup>123</sup> In the United States, an 805-kilometer-wide area in which cactus pygmy-owls have never been sighted separates the eastern and western populations of pygmy-owls.<sup>124</sup> In Mexico, the eastern and western populations are considered by some experts to be completely separated by mountains because the pygmy-owl generally only occurs at elevations below 1,200 meters.<sup>125</sup> Other experts argue that the two populations are contiguous at the far southern end of their range.<sup>126</sup>

The cactus pygmy-owl is nonmigratory; therefore, the FWS concluded that it was unlikely that genetic mixing would occur across the wide geo-

117. Final Rule To List the Mississippi Gopher Frog Distinct Population Segment of Dusky Gopher Frog as Endangered, 66 Fed. Reg. 62,993, 62,995 (Dec. 4, 2001).

118. Determination of Endangered Status for the Cactus Ferruginous Pygmy-Owl in Arizona, 62 Fed. Reg. 10,730, 10,730 (Mar. 10, 1997).

119. *Id.*

120. *Id.*

121. *Id.*

122. *Id.*

123. *Id.* at 10,731.

124. *Id.*

125. *Id.*

126. *Id.*

graphic separations discussed above.<sup>127</sup> The FWS also noted distinctions between the plumages of the two populations.<sup>128</sup>

In 1992, a group of conservation organizations petitioned the FWS to list the cactus pygmy-owl as an endangered subspecies.<sup>129</sup> In 1997, the FWS issued a listing decision (“Listing Rule”) in which the FWS decided to further review the evidence for the Mexican populations,<sup>130</sup> list the Arizona pygmy-owl as endangered, and withhold finalizing the listing of the Texas population.<sup>131</sup>

### B. *The Decision by the Arizona District Court*

In January of 2000, Plaintiffs, the National Association of Homebuilders, Southern Arizona Homebuilders Association, and Homebuilders Association of Central Arizona, submitted a motion for summary judgment against the FWS.<sup>132</sup> The Plaintiffs argued that the Arizona pygmy-owl was not discrete and requested that the court declare unlawful and set aside two rules promulgated by the FWS in the 1997 Listing Rule. The rules listed the Arizona pygmy-owl as endangered and designated critical habitat for the Arizona pygmy-owl.<sup>133</sup> The district court held that the FWS did not act arbitrarily or capriciously in finding that the Arizona population of the Arizona pygmy-owl was discrete and significant.<sup>134</sup>

The Plaintiffs only challenged a portion of the FWS’s listing. The Plaintiffs conceded that the eastern (Texas plus eastern Mexico) and western (Arizona plus western Mexico) populations were DPSs and therefore qualified as “species” under the ESA.<sup>135</sup> The Plaintiffs also did not challenge the FWS listing based on the significance of the population seg-

127. *Id.*

128. *Id.*

129. *Id.* at 10,732.

130. The United States specifically makes a commitment to the “worldwide protection of endangered species and threatened species” in the ESA. 16 U.S.C. § 1537(a) (2000). The ESA was enacted partially in order to implement various international environmental treaties. In its declaration of purpose for the ESA, Congress stated that the United States has pledged to protect endangered and threatened species in several international treaties, including migratory bird treaties with Canada and Mexico, the Migratory and Endangered Bird Treaty with Japan, the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere, the International Convention for the Northwest Atlantic Fisheries, the International Convention for the High Seas Fisheries of the North Pacific Ocean, and the Convention on International Trade in Endangered Species of Wild Fauna and Flora. *Id.* § 1531(a).

131. Determination of Endangered Status for the Cactus Ferruginous Pygmy-Owl in Arizona, 62 Fed. Reg. at 10,731.

132. Nat’l Ass’n of Homebuilders v. Norton, No. CIV-00-0903-PHX-SRB, 2001 U.S. Dist. LEXIS 24817, at \*2 (Sept. 19, 2001).

133. *Id.* at \*2, 11.

134. *Id.* at \*18.

135. *Id.* at \*12.

ment.<sup>136</sup> Despite this, the court held that the FWS had properly found that the Arizona population was significant to its taxon, and thus satisfied the significance factor outlined in the Joint Policy.<sup>137</sup> The court noted that the population was declining in Arizona, and Arizona used to constitute the cactus pygmy-owl's "major United States" range.<sup>138</sup> Because of these facts, the court held that the FWS's Listing Rule was warranted.<sup>139</sup>

The Plaintiffs also argued that the FWS could not list the Arizona population without considering the Mexican population of the pygmy-owl because there was no biological difference between the two populations.<sup>140</sup> The court rejected this argument; it held that dividing the Arizona pygmy-owl population by the international border between Mexico and the United States was "consistent with the policy and intent of the ESA."<sup>141</sup> Agreeing with the FWS, the court held that the differences in management that exist between Mexico and the United States justified distinguishing between the two populations.<sup>142</sup>

### C. *The Decision by the Ninth Circuit*

In 2003, the Plaintiffs appealed the district court's decision upholding the designation of the Arizona pygmy-owl as a DPS.<sup>143</sup> The Plaintiffs argued that the FWS's designation of the Arizona pygmy-owl as a DPS violated the Joint Policy because the Arizona pygmy-owl population is neither discrete nor significant.<sup>144</sup> In their appeal, the Plaintiffs did not challenge the Joint Policy itself; the Plaintiffs agreed that the Joint Policy was subject to *Chevron* deference.<sup>145</sup> The Plaintiffs only challenged the application of

136. *Id.*

137. *Id.* at \*14–15.

138. *Id.* at \*15–16.

139. *Id.* at \*16–18.

140. *Id.* at \*12.

141. *Id.* at \*17.

142. *Id.* at \*15.

143. *Nat'l Ass'n of Homebuilders v. Norton*, 340 F.3d 835, 838 (9th Cir. 2003).

144. *Id.* at 841.

145. *Id.* Because the Plaintiffs did not challenge the Joint Policy itself, judicial deference was not an issue in *National Association of Homebuilders*. The recommendations that follow are based on the assumption that the Agencies have the authority to interpret the meaning of distinct population segment. The Supreme Court outlined a two-part test for judicial analysis of agency rulemaking in *Chevron U.S.A., Inc. v. Natural Resources Defense Council, Inc.*, 467 U.S. 837, 842 (1984). First, the court must decide whether Congress has "directly spoken to the precise question at issue." *Id.* If the Congressional intent is clear, both the court and the agency must fulfill the express intent of Congress. *Id.* at 842–43. If the court determines that the Congressional intent is unclear, the court cannot merely impose its own interpretation of the statute. *Id.* at 843. In the event that the statute is "silent or ambiguous with respect to the specific issue," the court must decide whether the agency's interpretation is a "permissible construction of the statute." *Id.* The Supreme Court has recently addressed the issue of judicial deference to

the Joint Policy to the Arizona pygmy-owl.<sup>146</sup> The Ninth Circuit found that the FWS acted arbitrarily and capriciously in designating the Arizona pygmy-owl as a DPS.<sup>147</sup> The Ninth Circuit reversed the district court's decision and remanded the Listing Rule to the district court.<sup>148</sup>

The Ninth Circuit did not completely overturn the district court's decision. The court did not find that the FWS acted arbitrarily in relying on the differences in the conservation status of pygmy-owls across the international border to find that the Arizona pygmy-owl satisfied the discreteness element of the Joint Policy.<sup>149</sup> The FWS's finding that pygmy-owls were very limited in Arizona even though the species existed in greater numbers in northwestern Mexico was an appropriate application of Agency expertise.<sup>150</sup>

The court did find, however, that the FWS failed in its finding on the second element for identifying a DPS; the FWS did not demonstrate a rational basis in the Listing Rule for its finding that the Arizona pygmy-owl is significant to its taxon.<sup>151</sup> The FWS relied on two factors to find that the Arizona pygmy-owl is significant to its taxon. First, the FWS based its decision on evidence that the loss of the Arizona pygmy-owl would result in a significant gap in the range of its taxon.<sup>152</sup> Second, the FWS relied on evidence that the Arizona pygmy-owls' genetic characteristics differ markedly from other populations of the species.<sup>153</sup>

The court agreed with the FWS that the loss of the Arizona pygmy-owl population would cause a gap in the range of the taxon.<sup>154</sup> Because the definition of "gap" is unclear, the FWS is entitled to deference in interpreting its own regulations.<sup>155</sup> Even though the court agreed with the FWS that the loss of the Arizona pygmy-owl would create a gap in the range of the taxon, however, the court found that the gap would not be *significant*.<sup>156</sup>

agency decision making in *United States v. Mead Corp.*, 533 U.S. 218 (2001). *Chevron* deference to agencies is mandatory when Congress has "delegated authority to the agency generally to make rules carrying the force of law," and the agency interpretation of the statute was developed while exercising that authority. *Id.* at 226–27. Congressional delegation of authority may be shown in many ways, including an agency's ability to adjudicate or make rules. *Id.* at 227.

146. *Nat'l Ass'n of Homebuilders*, 340 F.3d at 841.

147. *Id.* at 842.

148. *Id.* at 838.

149. *Id.* at 844.

150. *Id.*

151. *Id.*

152. *Id.* at 845.

153. *Id.* at 850.

154. *Id.* at 846.

155. *Id.* at 845.

156. *Id.* at 850.

Although the FWS advanced four factors supporting the finding that the gap would be significant, the court did not accept any of the rationales. According to the FWS, the gap would be significant because the extinction of the Arizona pygmy-owl would "(1) decrease the genetic variability of the taxon; (2) reduce the current range of the taxon; (3) reduce the historic range of the taxon; and (4) extirpate the western pygmy-owl from the United States."<sup>157</sup>

Regarding the first rationale, the decrease in the genetic variability of the taxon, the court found that the FWS had not proven that the Arizona population of the pygmy-owl was genetically distinct from the northwestern Mexico population of pygmy-owl.<sup>158</sup> The court stated that the FWS's Listing Rule does not contain evidence of genetic variability between the Arizona and northwestern Mexico pygmy-owls. Therefore, arguing that the loss of the Arizona population is significant because it would "decrease the genetic variability of the taxon" seemed to be a "post hoc rationalization."<sup>159</sup>

Second, the FWS stated that the extinction of the Arizona pygmy-owl would reduce the current range of the pygmy-owl population as a whole. The court found that the FWS did not apply this factor in either of the two ways that the FWS has previously applied it.<sup>160</sup> First, in order to find a "reduction in current range," the population at issue must cover a large enough geographic area that the loss of the population would extensively decrease the taxon's range. However, the FWS stated in the Listing Rule that the range of the Arizona pygmy-owls only was "a small percentage" of the total range of the western pygmy-owls.<sup>161</sup> The second way that the loss of a discrete population could be considered to reduce the current range of the taxon is if the discrete population makes up a large percentage of the total population of the taxon.<sup>162</sup> However, the FWS did not claim that the loss of the population of twenty to forty cactus pygmy-owls would significantly restrict the cactus pygmy-owls' total population.<sup>163</sup> Thus, the court found that the western pygmy-owl population is largely composed of the Mexican pygmy-owl population, and that the loss of the Arizona

157. *Id.* at 846.

158. *Id.* at 847.

159. *Id.* (internal quotation marks omitted).

160. *Id.*

161. *Id.* at 848 (quoting Determination of Endangered Status for the Cactus Ferruginous Pygmy-Owl in Arizona, 62 Fed. Reg. 10,730, 10,737 (Mar. 10, 1997)).

162. *Id.*

163. *Id.*

pygmy-owl would not significantly reduce the current range of the whole western pygmy-owl population.<sup>164</sup>

For the third factor, the court held that the FWS did not provide a rational basis for the claim that the loss of the Arizona pygmy-owl would result in a reduction of the historical range of the taxon. The meaning of a reduction in the historical range of the taxon is not clear. Therefore, the court analogized to the “significant portion of the range” required to list an entire species.<sup>165</sup> An “endangered species” under the ESA is defined as “any species which is in danger of extinction throughout all or a significant portion of its range.”<sup>166</sup> This phrase is not defined in the ESA, and in a prior case, the Ninth Circuit held that a species would be extinct through a significant portion of its range “if there are major geographical areas in which it is no longer viable but once was.”<sup>167</sup>

Using this analogy, the historical range of the pygmy-owl taxon would be reduced if the range of the Arizona pygmy-owl constitutes a “major geographical area” of the total viable range of the pygmy-owl.<sup>168</sup> According to the court, the map that the FWS included within the listing decision did not clearly show that the range of the Arizona pygmy-owl constituted a “major geographical area” of the total pygmy-owl range.<sup>169</sup> Thus, the court found that while the Arizona range might be significant to the taxon’s historic range, the FWS did not rationally justify this conclusion in the Listing Rule.<sup>170</sup>

For the final factor, the court held that the FWS erroneously found that the gap caused by the loss of the Arizona pygmy-owl would be significant merely because it would extirpate the United States population of the western pygmy-owl. The court also dismissed the Appellees’ argument that the Arizona pygmy-owl’s range is significant because it is located in the United States where the Arizona pygmy-owl can receive ESA protection.<sup>171</sup> In order to identify a DPS under the Joint Policy, the FWS must find that a discrete population is significant to the taxon as a whole, not just

164. *Id.*

165. *Id.* at 848–49.

166. *Id.* at 848 (quoting 16 U.S.C. § 1532(6) (2000) (emphasis omitted)).

167. *Id.* (quoting *Defenders of Wildlife v. Norton*, 258 F.3d 1136, 1145 (9th Cir. 2001)).

168. *Id.* at 849. This is an erroneous comparison. The FWS never included the word significant in the statement that the loss of the pygmy-owl would “reduce the historical range of the taxon.” The court added the word significant on its own. Because the word significant was not in the original claim by the FWS, the court should not have used it to analogize.

169. *Id.*

170. *Id.*

171. *Id.*

to the United States.<sup>172</sup> The court relied on the past practices of the FWS to make this decision; in the past, the FWS only has found a gap to be significant because of a loss of the United States population when some further significance to the taxon as a whole also was present.<sup>173</sup> In this case, the FWS advanced no evidence that the Arizona pygmy-owl has additional significance to the taxon as a whole.<sup>174</sup>

Finally, the court found that the FWS did not satisfactorily prove the fourth significance factor outlined in the Joint Policy; the FWS did not prove<sup>175</sup> that the Arizona pygmy-owl "differs markedly from other populations of the species in its genetic characteristics."<sup>176</sup> Because the FWS divided the Arizona pygmy-owls and the northwestern Mexico pygmy-owls into separate populations in the Listing Rule, the court held that the FWS was required to demonstrate that the Arizona pygmy-owls differed genetically from the northwestern Mexico pygmy-owls.<sup>177</sup> The court concluded, however, that neither the Listing Rule nor the record contained facts supporting the FWS's claim of marked genetic variation between the pygmy-owls in Arizona and northwestern Mexico.<sup>178</sup>

Accordingly, the court held that the FWS did not state a rational basis in the Listing Rule for the finding that the discrete Arizona pygmy-owl population was significant—neither because the loss of the Arizona pygmy-owl would result in a significant gap in the range of its taxon nor because the Arizona pygmy-owl diverged genetically from the northwestern Mexico pygmy-owls.<sup>179</sup> Therefore, the court determined that the FWS acted arbitrarily and capriciously in designating the Arizona pygmy-owl population as a DPS.<sup>180</sup> This holding illustrates that the courts require an exceptionally high level of proof to uphold Agency listings of DPSs.

172. *Id.*

173. *Id.*

174. *Id.* at 850.

175. The court made this statement despite evidence in the Listing Rule to the contrary. The Listing Rule stated that cactus pygmy-owls are nonmigratory and the two populations are separated by "basin-and-range mountains and intervening Chihuahuan Desert basins" and the "highlands of the Sierra Madre Oriental and Occidental, and the Mexican Plateau" in Mexico. *Id.* at 851 (citing Determination of Endangered Status for the Cactus Ferruginous Pygmy-Owl in Arizona, 62 Fed. Reg. 10,730, 10,731 (Mar. 10, 1997)). The Listing Rule also cited a scientific study that had found morphological differences in plumage between the two populations. *Id.*

176. *Id.*

177. *Id.* at 850.

178. *Id.*

179. *Id.* at 852.

180. *Id.*

IV. THE AGENCIES SHOULD AMEND THE JOINT POLICY AND THE COURTS SHOULD USE THE PRECAUTIONARY PRINCIPLE WHEN REVIEWING DPS LISTINGS.

The current system for designating DPSs is flawed in several ways. First, the Joint Policy does not adequately identify DPSs; this failure to properly identify DPSs leads to inconsistent protection of endangered and threatened DPSs. Second, the Agencies do not apply the Joint Policy as written; the Agencies use geographic isolation and lack of genetic exchange as determinative factors in their listing decisions, and do not satisfactorily support their findings of “significance.” Because the Joint Policy does not emphasize the importance of these factors and specifically requires a finding of “significance,” the courts have criticized the Agencies’ failure to follow their own policy and have voided their listing decisions. Third, the Agencies do not require consistent levels of information and proof to identify DPSs, which also has led to judicial reversals of Agency listing decisions. Finally, the courts hold the Agencies to an unreasonably high burden of proof when analyzing Agency DPS listing decisions; this excessively high standard of proof leads to the invalidation of legitimate DPS listings. Because the existing system is flawed in the above ways, the Agencies and courts should take the following actions to correct the problems presented by the current application of the Joint Policy: (1) the Agencies should use an “Evolutionary Unit” rule for listing DPSs, which would emphasize the importance of geographic isolation and lack of genetic exchange and deemphasize the significance factor; (2) the Agencies only should list a DPS if it would be a “minimum viable population” if the population were healthy; (3) the Agencies should adopt a uniform standard of proof for the Agencies to require when listing DPSs; and (4) the courts should follow a “precautionary principle” when analyzing DPS listing decisions.

A. *The Agencies should combine the factors outlined in both the “discreteness” and “significance” standard into one “Evolutionary Unit” standard.*

The Agencies should merge the factors outlined in both the discreteness and significance elements into one Evolutionary Unit standard in order to better identify DPSs. The National Research Council, a division of the National Academy of Sciences, supports the Evolutionary Unit standard.<sup>181</sup>

181. NAT’L RESEARCH COUNCIL, *supra* note 33, at 45.

An Evolutionary Unit is a "group of organisms that represent a segment of biological diversity that shares evolutionary lineage and contains the potential for a unique evolutionary future."<sup>182</sup>

The primary characteristic of an Evolutionary Unit is that it is entirely distinct from other Evolutionary Units.<sup>183</sup> A distinct population indicates an independent evolutionary future, or the potential for a genetic divergence from the rest of the species.<sup>184</sup> The Evolutionary Unit analysis focuses on the potential for differentiation between the population at issue and the rest of the species. The National Research Council states that the distinctiveness necessary to identify an Evolutionary Unit can be shown in many different ways, including morphological, behavioral, genetic, molecular, physiological, or ecological information.<sup>185</sup> The type of studies that might need to be conducted in order to identify an Evolutionary Unit would include an analysis of "reproductive isolation, genetic variation, ecological distinctiveness and importance, details of reproductive ecology and dispersal, geographic isolation, and historic and prehistoric range changes and their causes."<sup>186</sup>

Combining the two current elements into one Evolutionary Unit element is logical given the way that the Agencies have defined the significance factor. All of the factors that the Agencies have currently outlined to find that a discrete population is significant are simply attempts to determine whether a population is isolated and distinct from the other members of the species. If the Agencies adopt the Evolutionary Unit standard to establish discreteness, this standard will also address all of the currently outlined factors for significance.

The first significance factor, persistence of the species in an "ecological setting unusual or unique for the taxon," appears to be trying to identify populations that have adapted to a different habitat. If the population is adapted to a different habitat, it is likely to be different genetically, behaviorally, morphologically, or in some other way.

The second significance factor, whether the loss of the population "would result in a significant gap in the range of a taxon," is attempting to quantify genetic differences. This attempt to identify genetic differences is

182. *Id.* The Evolutionary Unit standard is different from the Evolutionarily Significant Unit developed by NMFS in two important respects. First, the Evolutionary Unit does not emphasize reproductive isolation as a factor. Second, the Evolutionary Unit stresses the evolutionary future of the population more clearly than the Evolutionarily Significant Unit does. *Id.* at 45 n.2.

183. *Id.* at 45.

184. *Id.*

185. *Id.* at 45, 53.

186. *Id.* at 53.

related to the theory of genetic drift. Genetic drift occurs when an isolated population has a different gene frequency than the larger population of the species.<sup>187</sup> In other words, genetic drift results in the isolated population having different genetic characteristics from the main population of the species. If the loss of the population at issue in a DPS listing decision results in two sections of the taxon that never exchange genetic information, the two populations are more likely to become extremely different genetically. Because the first two significance factors both relate to genetic diversity, applying an Evolutionary Unit standard will identify the same considerations as these significance factors.

The third significance factor, whether the population “represents the only surviving natural occurrence of a taxon that may be more abundant as an introduced population outside its historic range,” also relates to genetic diversity. A population that still lives in the same habitat from which it evolved is likely to be evolutionarily distinct from members of the species that have been reintroduced from other parts of the world. The population has likely evolved differently from other members of its species because it has adapted to its local environment. Finally, the fourth factor, which questions whether the population “differs markedly from other populations of the species in its *genetic* characteristics” clearly relates to genetic diversity. Both the “distinct” and “significance” standards would be addressed by the Evolutionary Unit standard.

In both the “distinct” and the “significance” elements, the Agencies are simply trying to identify the characteristics of a differentiated population; both of the elements are trying to prove the same fact. Because the two elements prove essentially the same thing, the Agencies do not support their conclusions of “significance” with much evidence. This lack of support often leads to judicial reversal. Therefore, both elements should be consolidated into one Evolutionary Unit standard that encompasses the same criteria.

1. The Agencies should continue to rely on geographical separation in order to prove the Evolutionary Unit standard.

The Joint Policy currently relies heavily on geographical separation to prove discreteness; the Evolutionary Unit standard would formalize this reliance. Geographical separation is an important way of differentiating between species.<sup>188</sup> The names of subspecies of species that vary morpho-

187. Arthur L. Buikema, *Genetic Drift*, at <http://bioinquiry.biol.vt.edu/bioinquiry/Cheetah/cheetah-paid/cheetahhtmls/drift3.html> (last visited Jan. 17, 2005).

188. American Museum of Natural History, *supra* note 32.

logically according to geographic area often incorporate distinctive geographic forms.<sup>189</sup> Using geographical separation in order to prove discreteness is logical; it is objective rather than subjective and does not require the completion of sophisticated scientific studies.

Relying on geographical separation also is scientifically valid. Geographically isolated but morphologically similar species have traditionally been considered closely related.<sup>190</sup> However, many scientists now believe that geographically separated populations are actually genetic varieties within a species.<sup>191</sup> These genetic differences are the precursors to the formation of separate species.

The two foundational elements of the formation of species are isolation and differentiation.<sup>192</sup> When a population of a species becomes isolated from the rest of the species, genetic drift occurs.<sup>193</sup> Genetic drift leads to small discrete populations that do not exchange genes with the larger gene pool of the species.<sup>194</sup> If this genetic drift leads to the small population having a different rate of occurrence for genetic traits than the larger population, the new population will eventually become genetically different from the rest of the species.<sup>195</sup> Genetic drift can occur quickly and lead to dramatic changes in the morphological or genetic traits, or both, of the population.<sup>196</sup> Because genetic drift—and thus species differentiation—depends on geographic isolation, geographical separation is a valid factor to rely on when identifying DPSs.<sup>197</sup>

189. *Id.*

190. *Id.*

191. NAT'L RESEARCH COUNCIL, *supra* note 33, at 42.

192. *Id.* at 41.

193. Buikema, *supra* note 187.

194. *Id.*

195. *Id.*

196. A dramatic example of genetic drift is the white-tailed deer population in the Seneca Army Depot. The Seneca Army Depot consists of 11,000 acres that were fenced off in the 1950s. Hunting is not allowed at the depot; this ban is strictly enforced. White-phased deer, which are normally very rare, occur in great numbers within the fenced area. In 1993, there were an estimated 150 albino deer and 300 normal deer. *Id.*

197. Relying on geographic separation in order to prove differentiation (including genetic differentiation) is preferable to relying too heavily on genetic studies. Genetic studies require more equipment and training than other types of studies. Many ESA listing petitions are initiated by small environmental organizations that cannot necessarily afford to conduct or fund sophisticated genetic studies. The Biodiversity Legal Foundation of Colorado is a paradigm example of a small environmental organization that creates listing petitions. For the fiscal year ending in 2002, the Biodiversity Legal Foundation had \$7,980 in revenue. Guidestar, *Biodiversity Legal Foundation: Financial Snapshot for Fiscal Year Ending 2002*, at [http://www.guidestar.org/controller/searchResults.gs?action\\_gsReport=1&npold=-65759](http://www.guidestar.org/controller/searchResults.gs?action_gsReport=1&npold=-65759) (last visited Jan. 17, 2005). In 1999, the Biodiversity Legal Foundation and the Northwest Ecosystem Alliance petitioned the FWS to list Washington state's greater sage grouse populations as a DPS. Susan J. Tweit, *The Next Spotted Owl?*, AUDUBON (Nov.–Dec. 2000), at <http://magazine.audubon.org/features0011/sagegrouse.html>.

2. The Agencies should adopt lack of genetic exchange as one of the factors for identifying an Evolutionary Unit.

In order to accurately identify DPSs, the Agencies should include the lack of genetic exchange as a factor in the proposed Evolutionary Unit standard. The lack of genetic exchange would prove the discreteness of a population; the less actual genetic mixing that occurs between the populations, the more likely it is that the two populations are actually differentiated.<sup>198</sup>

Lack of genetic exchange can be proven through many methods. Obviously, the Agencies or the organization that prepares the listing petition could rely on genetic studies to prove differences in the DNA of the populations. Alternatively, the Agency could look at the typical range of the species to make such a determination. For example, if a species has a range of less than five square miles, it is unlikely that there is much genetic exchange between populations separated by fifty miles. The Agencies also could look at the migratory habits of the species; if the species is nonmigratory, then the potential DPS is less likely to exchange genetic material with a geographically separated population. Or, the Agencies could evaluate the suitable habitat surrounding the population. If the populations were separated by great expanses of unsuitable habitat, it would suggest that there is little genetic exchange between the populations.

*B. The Agencies should require a "minimum viable population."*

In addition to the Evolutionary Unit element for determining a DPS, the Agencies should adopt a "minimum viable population" standard as the second element for identifying a DPS. This would alleviate criticism of the DPS listings but still allow the Agencies to fulfill the purposes of the ESA and the Joint Policy. Opponents to the ESA amendment allowing the listing of DPSs argued that the DPS amendment could be used to list inappropriately small populations. The General Accounting Office originally requested that Congress amend the ESA in order to revoke the authority to list DPSs.<sup>199</sup> The General Accounting Office argued that the DPS amendment could be used to list a DPS of squirrels in a city park while there were other, healthy populations of the same species of squirrel in other parks in

198. *Maine v. Norton*, 257 F. Supp. 2d 357, 379 (D. Me. 2003).

199. David S. Pennock & Walter M. Dimmick, *Critique of the "Evolutionarily Significant Unit" as a Definition for "Distinct Population Segments" Under the U.S. Endangered Species Act*, 11 CONSERVATION BIOLOGY 611, 612 (June 1997) (citing General Accounting Office 1979).

the same city.<sup>200</sup> This argument against DPS listing is clearly exaggerated, but it illustrates the main critique of DPS listing decisions.

The Agencies only should list as DPSs those populations that would be minimum viable populations if the population were healthy. The glossary of terms relating to the Convention on Biodiversity defines a minimum viable population as the "smallest isolated population having a good chance of surviving for a given number of years despite the foreseeable effects of demographic, environmental, and genetic events and natural catastrophes. (The probability of persistence and the time of persistence are often taken to be 99 percent and 1,000 years, respectively.)"<sup>201</sup> One way that the Agencies could identify whether a population is a minimum viable population is through historical data. Strong evidence that a population has successfully existed in a certain area for an extensive amount of time lends credence to the suggestion that the population is viable. Historical evidence could be used to model whether the population would be viable if the threats it faced were alleviated. Under this set of principles, the Agencies would be unable to list small distinct populations such as the General Accounting Office's example of squirrels in a city park.

Adopting the minimum viable population standard would allow the Agencies to make more objective, uniform decisions. This in turn would lead to fewer court reversals of Agency decisions; it is difficult for a court to find that a decision is "arbitrary and capricious" if the Agency has a clear scientific rationale for its decision.

*C. The Agencies should adopt a uniform standard of evidence requirement for listing petitions.*

The Agencies should use comparable levels of proof in DPS listing decisions in order to make more rational listing decisions and create consistent results. A uniform standard of proof requirement would prevent unintentional exhibition of biases by the listing Agencies. Studies of human behavior and decision making have shown that intuitive decision making leads to more arbitrary and inconsistent decision making.<sup>202</sup> A more uniform standard of proof also would make it easier for environmental groups to develop listing decisions and would lead to fewer surprises for parties

200. *Id.* at 612–13.

201. European Community Biodiversity Clearing-House Mechanism, *Glossary of Terms Associated with the Convention on Biological Diversity*, at [http://biodiversity-chm.eea.eu.int/CHMIndex-Terms/Glossary/M/minimum\\_viable\\_population](http://biodiversity-chm.eea.eu.int/CHMIndex-Terms/Glossary/M/minimum_viable_population) (last visited Jan. 17, 2005).

202. NAT'L RESEARCH COUNCIL, *supra* note 33, at 123.

who are adversely affected by DPS listings. Finally, a uniform standard would lead to fewer court reversals of listing decisions.

The uniform standard of proof requirement would resemble the requirements for a complaint. Each element of the new DPS listing standard should be supported by an ultimate fact in the listing decision. For example, if the Agencies were relying on geographic separation in order to identify an Evolutionary Unit, the Agency would be required to identify all of the facts used to decide this, including the actual distance of the geographic separation and the Agencies' basis for concluding that the two populations are actually separated. These conclusions could be based on lack of suitable habitat, geographic features, or scientific studies noting an absence of the species in the area.

The Agencies currently use drastically different levels of proof to support similar assertions in different DPS listing decisions. For example, the Agencies often use geographic separation to identify a DPS, but only occasionally identify the level of geographic separation. In the California salamander DPS listing decision, the FWS relied on geographical separation to prove distinctiveness and clearly outlined both the distance of separation and the geographic features separating the populations.<sup>203</sup> In contrast, in a decision to list the Peninsular Ranges DPS of the desert bighorn sheep, the FWS simply stated that the population is geographically separated without providing any evidence of this fact.<sup>204</sup>

The Agencies need not adjust their listing process dramatically in order to develop a uniform standard of proof. The uniform proof standard does not always require more information; the Agencies simply need to supply the information in an orderly, logical manner. The Agencies should simply support each claim that they make, and if there is no actual science directly on point, the Agencies should identify the science from which they are extrapolating.<sup>205</sup>

203. Listing of the Central California Distinct Population Segment of the California Tiger Salamander; Reclassification of the Sonoma County and Santa Barbara County Distinct Populations From Endangered to Threatened; Special Rule, 68 Fed. Reg. 28,648, 28,652 (May 23, 2003).

204. Endangered Status for the Peninsular Ranges Population Segment of the Desert Bighorn Sheep in Southern California, 63 Fed. Reg. 13,134, 13,136 (Mar. 18, 1998).

205. In certain cases, the Agencies might need to rely exclusively on expert opinion in order to fill in the gaps of the scientific evidence. This would be a reasonable use of agency expertise as long as the agencies clearly outline the level of expertise of the expert. Experts have often accumulated enough experience to allow them to make informed statements about endangered species listings and sometimes, the only available information is an expert opinion. NAT'L RESEARCH COUNCIL, *supra* note 33, at 124.

D. *The courts should adopt the "precautionary principle" when reviewing DPS designations.*

The changes to the Agencies' Joint Policy suggested above will make judicial reversal less likely. However, these Agency actions alone are not enough to solve the problems with the current DPS listing process if the courts can still erroneously overturn Agency listing decisions. Thus, the courts should follow the precautionary principle when analyzing scientific information in order to avoid falsely voiding a valid Agency listing decision.<sup>206</sup> The Rio Declaration outlines the precautionary principle in Principle 15: "[w]here there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."<sup>207</sup> The Declaration also states "the precautionary approach shall be widely applied by States."<sup>208</sup>

Courts have noted that Congress intended courts to err on the side of protecting species when analyzing the ESA. The Supreme Court stated that Congress made it "abundantly clear that the balance has been struck in favor of affording endangered species the highest of priorities, thereby adopting a policy which it described as institutionalized caution."<sup>209</sup> In relation to the issuance of injunctions, the Ninth Circuit has stated "the language, history, and structure of the ESA demonstrates Congress' determination that the balance of hardships and the public interest tips heavily in favor of protected species."<sup>210</sup>

The courts should adopt the precautionary principle because the risk from failing to protect a population that is actually distinct is much greater than the risk from falsely designating a population as distinct.<sup>211</sup> The bio-

206. The Administrative Procedures Act sets the "arbitrary and capricious" threshold for analyzing Agency decisions. *See supra* note 28. The precautionary principle is not an attempt to undermine the Administrative Procedures Act; the precautionary principle complies with the minimum threshold outlined by the Administrative Procedures Act. The precautionary principle is simply an interpretation of the "best available science" requirement set by the ESA. 16 U.S.C. § 1533(b)(1)(A) (2000).

207. Declaration on Environment and Development, June 14, 1992, Principle 15, at <http://www.unep.org/Documents/Default.asp?DocumentID=78&ArticleID=1163>. The Rio Declaration is a nonbinding instrument that was drafted during the 1992 United Nations Conference on Environment and Development in Rio de Janeiro. The Rio Declaration's twenty-seven principles reaffirm and add to the Stockholm Declaration on the Human Environment. Many environmental agreements drafted since the Rio Conference have included the Principles from the Rio Declaration. United Nations Environmental Program, *MEAs and Non-binding Instruments: Multilateral Environmental Agreements*, at <http://www1.unep.org/geo-text/0136.htm> (last visited Jan. 17, 2005).

208. *Id.*

209. *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 194 (1978) (internal quotation marks omitted).

210. *Nat'l Wildlife Fed'n v. Burlington N.R.R.*, 23 F.3d 1508, 1511 (9th Cir. 1994).

211. NAT'L RESEARCH COUNCIL, *supra* note 33, at 127.

logical and socioeconomic costs of the two different types of errors are highly uneven.<sup>212</sup> For example, failing to designate an endangered or threatened population as distinct can lead to an irreparable consequence: the extinction of a biologically and genetically diverse population. This extinction could then have irreversible impacts on biodiversity and the species as a whole. DPSs are often part of a “metapopulation,” or a network of populations that depend on sporadic interbreeding with other populations for their long-term survival.<sup>213</sup> The loss of this ability to occasionally exchange genes can lead to genetic isolation; genetic isolation can make the metapopulation as a whole more vulnerable to extinction.<sup>214</sup>

Conversely, the false designation of a distinct population has neutral environmental and biological effects and only *possible* negative socioeconomic effects.<sup>215</sup> Also, if more information becomes available, anyone can petition the Agencies to delist the DPS or challenge the distinctiveness of the DPS. However, it is not possible to list a DPS once the DPS becomes extinct.

Clearly, the courts should still require the Agencies to provide support for any action that they take. However, lack of complete scientific certainty should not be used to frustrate the purposes of the ESA. The ESA simply requires the Agencies to rely on the “best scientific and commercial data available.”<sup>216</sup>

The court should require a standard of proof that is commensurate with the type of action the agency is attempting to take. A decision to not designate a DPS should be held to a higher standard of proof than a decision to designate a DPS. Differing burdens of proof are common throughout the law. For example, the courts should analogize to criminal law, where the prosecution has a much higher burden of proof than the defendant. For DPSs, the consequences of not designating a genuine DPS are much more disastrous than of falsely designating a DPS, just as the consequences of wrongly convicting an innocent person are more harmful than wrongly freeing a guilty person.

If a court found the standard of proof unmet by the Agency, it could treat the DPS as if it were listed (i.e., place a moratorium on development) and require the Agency to provide more information at a further date. This strategy would correct “arbitrary and capricious” decisions while still ap-

212. *Id.*

213. *Id.* at 46.

214. *Id.*

215. *Id.* at 127.

216. 16 U.S.C. § 1533(b)(1)(A) (2000).

plying the precautionary principle to protect potential endangered species. This is a familiar theory in law; it would be similar to a temporary restraining order or a preliminary injunction. The treatment of the species as if it were listed would prevent the potential DPS from going extinct before the Agency could develop enough information to conclusively decide whether to designate the population as a DPS.

The adoption of a moratorium on any activities that harm the possible DPS would help advance the purposes of the ESA and the Joint Policy. It would allow the Agencies to protect species and the ecosystems on which they depend before the whole species is threatened or endangered.<sup>217</sup> It also would allow the Agencies to address the species' decline in a timelier manner.<sup>218</sup>

The NMFS implicitly applied the precautionary principle when it listed the Snake River Sockeye Salmon as endangered despite the fact that it was unclear whether the population at issue was actually distinct from other populations.<sup>219</sup> The NMFS listed the population solely based on preliminary evidence that the population was distinct from other salmon populations.<sup>220</sup> Subsequent scientific research showed that the Snake River Sockeye Salmon was actually genetically distinct from other salmon populations.<sup>221</sup>

#### *E. An Application of the New DPS Policy to Homebuilders*

Applying the advocated factors to the Arizona pygmy-owl would have the following result: (1) the Arizona pygmy-owl would be considered an Evolutionary Unit because it is geographically separated and does not exchange genetic material with other populations; (2) historical data would show that the Arizona pygmy-owl is a minimum viable population, if the factors threatening it were removed; (3) a uniform standard of proof would help the Listing Rule withstand judicial scrutiny; and (4) if the court were to apply the precautionary principle, it would uphold the FWS's listing of the Arizona pygmy-owl.

First, if an Evolutionary Unit standard were used rather than the discrete and significant tests currently applied, the listing decision would have

217. 16 U.S.C. § 1531(b).

218. Draft Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act; Request for Public Comment, 59 Fed. Reg. 65,884, 65,885 (Dec. 21, 1994).

219. Endangered Status for Snake River Sockeye Salmon, 56 Fed. Reg. 58,619, 58,619 (Nov. 20, 1991).

220. *Id.*

221. NAT'L RESEARCH COUNCIL, *supra* note 33, at 134 n.1.

satisfied judicial review. The Arizona pygmy-owl is an Evolutionary Unit because it is geographically separated and does not exchange genetic material with other populations of cactus pygmy-owls. The distinctiveness necessary to identify an Evolutionary Unit can be shown by many different ways, including morphological, behavioral, genetic, molecular, physiological, or ecological information.<sup>222</sup> Both geographic isolation and lack of genetic exchange fit into the categories of behavioral and ecological information.

The Arizona pygmy-owl is geographically separated from the other three populations of the cactus pygmy-owl;<sup>223</sup> the FWS outlined several facts that support this assertion. First, the Arizona pygmy-owl is separated from the eastern United States population of cactus pygmy-owl by 805 kilometers; the cactus pygmy-owl has never been sighted in this 805-kilometer gap.<sup>224</sup> This large area is composed of mountains and the Chihuahuan desert;<sup>225</sup> neither of these areas provide suitable habitat for the cactus pygmy-owl because the cactus pygmy-owl subsists at elevations below 1,200 meters<sup>226</sup> and prefers to inhabit mesquite and cottonwood forests rather than open desert uplands.<sup>227</sup> Second, plateaus separate the eastern and western Mexican populations; the cactus pygmy-owl is rare or nonexistent on these plateaus.<sup>228</sup> Third, the two United States populations are separated from the two Mexican populations by 241 kilometers of habitat of the northern Sonoran desert in which the cactus pygmy-owl no longer occurs.<sup>229</sup> The 241 kilometers of separation exists because the area no longer contains suitable habitat; the vegetation has been converted from suitable mesquite and bosque forests to exotic<sup>230</sup> livestock forage.<sup>231</sup> The United States and Mexican populations also are separated by extensive agricultural and urban development in northern Mexico; the development

222. *Id.* at 45; *see supra* note 186 and accompanying text for a discussion of studies that could be used to identify Evolutionary Units.

223. *See supra* Part III.A for a discussion of the four populations of the cactus pygmy-owl.

224. Determination of Endangered Status for the Cactus Ferruginous Pygmy-Owl in Arizona, 62 Fed. Reg. 10,730, 10,731 (Mar. 10, 1997).

225. *Id.*

226. *Id.*

227. *Id.* at 10,740.

228. *Id.* at 10,731.

229. *Id.* at 10,741.

230. Exotic species refers to plants that are not native to a geographic area. Generally, humans have introduced exotic species. WEBSTER'S NEW WORLD COLLEGE DICTIONARY, *supra* note 67, at 499.

231. Determination of Endangered Status for the Cactus Ferruginous Pygmy-Owl in Arizona, 62 Fed. Reg. at 10,741.

makes it extremely unlikely that cactus pygmy-owls will move between the two populations.<sup>232</sup>

The Arizona pygmy-owl exchanges little genetic material with members of other cactus pygmy-owl populations. No genetic studies have been conducted on the Arizona pygmy-owl;<sup>233</sup> however, it is possible to show lack of genetic exchange in many ways besides genetic studies. First, the Arizona pygmy-owl is nonmigratory throughout its range.<sup>234</sup> Because the Arizona pygmy-owl is nonmigratory, it is less likely to exchange genetic material with the other geographically separated population. As stated above, the Arizona pygmy-owl is separated from the other United States population by 805 kilometers in which it has never been seen. In Mexico, the populations are separated by high plateaus, and Arizona pygmy-owls are usually only found at elevations below 1,200 meters. There is also evidence that the Arizona pygmy-owl is separated from the western Mexico population. The cactus pygmy-owl is almost absent in the 241 kilometers south of the United States-Mexico border. Additionally, the area in Mexico just south of the border is heavily developed, which inhibits the movement of cactus pygmy-owls between the two populations. Because the cactus pygmy-owl is nonmigratory, and the different populations are separated by wide expanses of unsuitable habitat in which the cactus pygmy-owl is not prevalent, it is very likely that the Arizona pygmy-owl does not exchange genetic material with other cactus pygmy-owl populations.

The Arizona pygmy-owl is an Evolutionary Unit because it is geographically separated from other members of the species and it does not exchange genetic material with other populations of cactus pygmy-owls. Therefore, the Arizona pygmy-owl exhibits a unique evolutionary future; there is a great potential that the Arizona pygmy-owl is or will become genetically differentiated from the other populations.

Second, even though the Arizona pygmy-owl would meet the requirements of an Evolutionary Unit, the proposed DPS test also would require the Agencies to demonstrate that the listing meets the minimum viable population requirement. The Arizona pygmy-owl does meet this requirement because historical data demonstrates that the Arizona pygmy-owl was abundant at one time. It is likely that the Arizona pygmy-owl

232. *Id.*

233. Genetic studies that have been conducted on other populations of cactus pygmy-owls (but not the Arizona pygmy-owl) show that the cactus pygmy-owl has low levels of genetic variation. *Id.* at 10,744. These low levels of genetic variation mean that it would be difficult to ascertain differences between the two populations of the species through genetic studies, because members of the same population are remarkably similar genetically.

234. *Id.* at 10,731.

would once again be viable if it were protected from the factors currently threatening it. The FWS refers to historical records in which the Arizona pygmy-owl is described as “‘common,’ ‘abundant,’ ‘not uncommon,’ and ‘fairly numerous’” along rivers in Arizona.<sup>235</sup> At one time, the population of cactus pygmy-owls in Arizona was clearly healthy and viable; absent human intervention, the Arizona pygmy-owl had a high probability of not going extinct within 1,000 years.<sup>236</sup> Additionally, the FWS has articulated many reasons for why it distinguished the Arizona pygmy-owl from the other three populations of cactus pygmy-owl. Natural boundaries exist around the Arizona pygmy-owl; the FWS did not arbitrarily define boundaries around an artificially small population in order to find the DPS endangered.<sup>237</sup>

Third, the FWS did not furnish the same amount of proof for the Arizona pygmy-owl that the FWS has often provided in the past.<sup>238</sup> The listing decision would be stronger and more persuasive with the inclusion of several key pieces of information. First, the FWS should have included the elevation of the mountains that separate the Arizona pygmy-owl from other populations of the cactus pygmy-owl. The FWS mentions that the Arizona pygmy-owl is separated from the other populations by mountains, and that the cactus pygmy-owl prefers elevations below 1,200 meters, but the FWS does not state the elevation of the mountains.<sup>239</sup> The inclusion of the elevation would let the reader and the courts better calculate the improbability of the Arizona pygmy-owl inhabiting the intervening mountains. Second, the FWS should have discussed why some scientific sources consider the eastern and western Mexican populations completely separated.<sup>240</sup> If the Mexican populations are completely disjunct, it lends credence to the idea that the eastern and western populations in both the United States and Mexico are distinct. Third, the FWS should have further discussed the development along the Mexico border that is inhibiting the movement of the cactus pygmy-owl.<sup>241</sup> An inhibition of movement would support a theory of genetic distinction between the Mexican and United States populations. Had a

235. *Id.* at 10,735.

236. *See supra* note 201 and accompanying text for a discussion of the time frame commonly used in the theory of minimum viable populations.

237. *See supra* note 200 and accompanying text for a discussion of the main fear people have regarding the abuse of the DPS listing process.

238. *See supra* section II.C.1 for an analysis of the different levels of proof required by the Agencies in prior listing decisions.

239. Determination of Endangered Status for the Cactus Ferruginous Pygmy-Owl in Arizona, 62 Fed. Reg. at 10,731.

240. *Id.*

241. *Id.* at 10,741.

uniform standard of proof been applied, all of these important facts would have been established and would have lent further credence to the idea that the Arizona pygmy-owl is a DPS.

Finally, if the court had utilized the precautionary principle, it is likely that the FWS's listing decision would have been upheld. In *Homebuilders*, the court did not employ the precautionary principle.<sup>242</sup> Instead, it focused on the fact that the FWS did not prove the existence of any genetic differences between the Arizona and western Mexico populations.<sup>243</sup> The court used a very narrow definition of "proving" genetic differences. In contrast, scientists agree that genetic separation can be proven by many different methods, including morphological, behavioral, genetic, molecular, physiological, or ecological information.<sup>244</sup>

The *Homebuilders* decision ignored the fact that cactus pygmy-owls are nonmigratory and separated by "basin-and-range mountains and intervening Chihuahuan Desert basins" and the "highlands of the Sierra Madre Oriental and Occidental, and the Mexican Plateau" in Mexico.<sup>245</sup> The court agreed that this "separation suggests infrequent genetic mixing between the two pygmy-owl populations," but the court did not consider the fact that vastly separated, nonmigratory populations also are likely to be genetically distinct.<sup>246</sup> The decision also mentioned studies noting morphological differences in plumage between the two populations but then dismissed this evidence.<sup>247</sup> The court disagreed with the phrasing of the FWS's findings by focusing on the fact that the FWS stated that a "*potential . . .* for genetic differences" exists between the western and eastern pygmy-owls.<sup>248</sup>

The *Homebuilders* court should have applied the precautionary principle to the Arizona pygmy-owl Listing Rule. The consequences of not finding that the Arizona pygmy-owl is a DPS are quite severe; there is evidence that the cactus pygmy-owl might become completely extirpated from Arizona because of urbanization, poor water management, and livestock graz-

242. The Ninth Circuit required the Agencies to provide a "reasoned basis" for their listing decisions. *Nat'l Ass'n of Homebuilders v. Norton*, 340 F.3d 835, 846 (9th Cir. 2003). The court stated that Agencies must "articulate a satisfactory explanation" in order to allow the courts to effectively review the Agency action. *Id.* (internal quotation marks and citation omitted).

243. *Id.* at 847.

244. NAT'L RESEARCH COUNCIL, *supra* note 33, at 53.

245. Determination of Endangered Status for the Cactus Ferruginous Pygmy-Owl in Arizona, 62 Fed. Reg. at 10,731.

246. *Nat'l Ass'n of Homebuilders*, 340 F.3d at 851.

247. *Id.*

248. *Id.* (citing Determination of Endangered Status for the Cactus Ferruginous Pygmy-Owl in Arizona, 62 Fed. Reg. at 10,731 (emphasis added)).

ing.<sup>249</sup> At several points, the court seemed to agree with the FWS, but then held that the FWS did not provide enough proof.<sup>250</sup> The court could have provisionally allowed the listing of the Arizona pygmy-owl as a DPS while requesting that the FWS gather more information regarding the Arizona pygmy-owl. The provisional listing of the Arizona pygmy-owl could than have involved a moratorium on any activities that affect the species.

#### CONCLUSION

In formulating the Joint Policy, the Agencies hoped to reduce the confusion and litigation surrounding the listing of DPSs. However, the listings of DPSs since the promulgation of the Joint Policy have been erratic and prone to litigation.

In order to solve these problems, the Agencies and courts should adopt the suggestions outlined above: (1) the Evolutionary Unit standard, which also would include all of the current factors for discrete and significant; (2) the minimum viable population, if the population were a healthy element; (3) a uniform standard of proof requirement; and (4) the precautionary principle for reviewing DPS listing decisions. The implementation of these standards would lead to a clearer DPS policy and fewer court reversals of Agency decisions. The adoption of the precautionary principle would prevent the courts from using the “arbitrary and capricious” standard to invalidate decisions where the Agencies are using the best available science.

249. Determination of Endangered Status for the Cactus Ferruginous Pygmy-Owl in Arizona, 62 Fed. Reg. at 10,740.

250. *See supra* notes 143–80 and accompanying text.