

RECOVERY IN A CYNICAL TIME—WITH APOLOGIES TO ERIC ARTHUR BLAIR

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Abstract: The drafters of the Endangered Species Act envisioned a process in which a species at risk of extinction would be protected while the threats it faces are removed so that it recovers. Over the first three decades of experience with the Act, implementation has proved to be far more complex. Recovering at-risk species imposes two different types of requirements. Biologically, recovery is a demographic problem: the species’s population must have increased in numbers and dispersed geographically to a point at which nature’s random risks have been reduced so that the species is no longer in danger of extinction. The risk-management problem is equally important: there must be regulatory or other conservation mechanisms that are sufficient to prevent the species from slipping back into its at-risk status once the Act’s protections are removed. Historically, species have been delisted as recovered when their demographic status was substantially improved and a risk-management system had been developed. Recently, however, the U.S. Fish and Wildlife Service has operationally redefined a crucial term in the Act’s risk assessment standards and has begun delisting species whose populations are still geographically restricted. This core-area management approach raises substantial biological questions—particularly in a time of rapid climatic change.

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INTRODUCTION

WAR IS PEACE
 FREEDOM IS SLAVERY
 IGNORANCE IS STRENGTH
 — George Orwell¹

EXTIRPATION IS RECOVERY
 — U.S. Fish & Wildlife Service²

The objective of the Endangered Species Act (ESA) is the conservation of at-risk species and the ecosystems upon which they depend.³ This is a more demanding goal than it might initially appear because Congress defined “conservation” as the obligation to “use . . . all methods and procedures which are necessary to bring any [listed] species to the point at which the measures provided pursuant to this chapter are no longer necessary.”⁴ The Act’s measures are no longer necessary when a species is no longer at risk of extinction—when it has been recovered.

To achieve this objective, the Act demands two types of actions. The first—which is the focus of this article—is *risk assessment*. The federal fish and wildlife agencies⁵ charged with implementing the Act are directed to assess the risk of extinction that a species faces. If the agency determines that a species is sufficiently at risk, the Act requires that it be listed as either threatened or endangered.⁶ Once a species has been listed, the Act’s second type of actions—*risk management*—come into

1. GEORGE ORWELL [ERIC ARTHUR BLAIR], NINETEEN EIGHTY-FOUR 5 (1st ed. 1949).

2. Cf. OFFICE OF INSPECTOR GEN., DEP’T OF THE INTERIOR, REPORT OF INVESTIGATION: JULIE MACDONALD, DEPUTY ASSISTANT SEC’Y, FISH, WILDLIFE, AND PARKS (2007), available at http://www.biologicaldiversity.org/swcbd/programs/esa/pdfs/DOI-IG-Report_JM.pdf; see also *Ctr. for Biological Diversity v. U.S. Fish & Wildlife Serv.*, No. C04-04324, 2005 WL 2000928, at *15 (N.D. Cal. 2005); Erik Stokstad, *Endangered Species Act: Appointee “Reshaped” Science, Says Report*, 316 SCI. 37 (2007).

3. 16 U.S.C. § 1531(b) (2000) (“The purposes of this chapter are to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, [and] to provide a program for the conservation of such endangered species and threatened species.”).

4. *Id.* § 1532(3).

5. The two agencies are the Fish and Wildlife Service (USFWS) in the Department of the Interior and the National Oceanic and Atmospheric Administration-Fisheries (NOAA-Fisheries) (formerly the National Marine Fisheries Service (NMFS)) in the Department of Commerce. *Id.* § 1532(15).

6. *Id.* § 1533(a)–(c).

play. These provisions are either extinction-prevention⁷ or recovery actions.⁸ Although their focus differs, both contribute to the ESA's overarching goal of "conserving" listed species: the first by preventing further decline, and the second by rebuilding the species's numbers toward recovery and delisting.

The drafters of the statute thus implicitly envisioned a linear process: when a species is determined to be sufficiently at risk of extinction, it is listed as either threatened or endangered. Following listing, the federal wildlife agency prepares a recovery plan that outlines how the threats facing the species will be eliminated. With help from other federal agencies, the threats are eliminated, the species recovers, and the agency delists the species. In the interim, the species is protected from all jeopardizing activities and takes.⁹ The species thrives after delisting because the threats to its existence have been removed.

Procedurally, the end of the process mirrors the beginning: the decision to delist a species as recovered also requires a risk assessment (a "status determination" in the language of the implementing agencies¹⁰) that applies the same statutory standards and follows the same procedures as the decision to list the species.¹¹ Both require the agency to evaluate the species's status—whether it is "threatened"¹² or "endangered"¹³—under five statutory factors:¹⁴

7. The Act's primary extinction-prevention provisions include: (1) the consultation mandate of section 7(a)(2), 16 U.S.C. § 1536(a)(2); (2) the civil and criminal sanctions imposed by sections 9, 4(d), and 11, *id.* §§ 1539(a)(1), 1539(a)(1)(G), 1533(d), 1540; and (3) the habitat conservation planning requirements in section 10(a)(1)(B) for obtaining an incidental take permit, *id.* §§ 1539(a)(1)(B), 1539(2). These extinction-prevention provisions are intended to prevent the continued decline of the species—they are akin to the Hippocratic oath: "First, do no harm."

8. Recovery actions are more varied, and include: (1) the requirement in section 4(f) that the appropriate federal fish and wildlife agency engage in recovery planning for the species, *id.* § 1533(f); (2) under section 7(a)(1), all federal agencies have an (under-enforced) affirmative obligation to "utilize their authorities in furtherance of the purposes of this chapter by carrying out programs for the conservation of [listed] species," *id.* § 1536(a)(1); (3) under section 10(a), the wildlife agencies are authorized to issue recovery permits "to enhance the . . . survival of the affected species," *id.* § 1539(a)(1)(A); (4) under section 10(j), the wildlife agencies are authorized to introduce experimental populations of listed species. *Id.* § 1539(j).

9. Although "take" is often equated with "kill" in common speech, the Act defines the term far more broadly to include "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." *Id.* § 1532(19). *See also* 50 C.F.R. § 17.3 (2006) (defining the broadest of the statutory terms, "harm").

10. 16 U.S.C. § 1533(a)(1).

11. *Id.* ("The Secretary shall by regulation promulgated in accordance with subsection (b) . . . determine whether any species is an endangered species or a threatened species.").

12. A species is "threatened" when it is "likely to become an endangered species within the

- (A) the present or threatened destruction, modification, or curtailment of its habitat or range;
- (B) overutilization for commercial, recreational, scientific, or educational purposes;
- (C) disease or predation;
- (D) the inadequacy of existing regulatory mechanisms; or
- (E) other natural or manmade factors affecting its continued existence.¹⁵

Although the decision to *delist* shares standards and procedures with the decision to *list*, the two decisions differ in several ways. At this point, one difference is relevant: the decision to delist a species removes the risk management provided by the ESA. As a result, the agency's risk assessment at delisting necessarily also includes an evaluation of the risk management that will remain after the ESA's protection is terminated by the delisting.¹⁶ The crucial question is whether the removal of the ESA's species-focused management mechanisms will leave the species once again foreseeably at-risk, thus making it at least threatened and precluding the delisting.

This is the irony of the ESA. The very power to regulate that can bring species back from the brink of extinction can make the statute irreplaceable. In part, this reflects the type of risks that species face: most have not been imperiled by discrete, remediable causes such as hunting, but rather by the incidental effects of habitat degradation and

foreseeable future throughout all or a significant portion of its range." *Id.* § 1532(20).

13. A species is "endangered" when it is "in danger of extinction throughout all or a significant portion of its range." *Id.* § 1532(6). For recovery, the crucial question is whether the species is "threatened" since a species that is threatened is less at-risk than a species that is endangered. Under the Act's interlocking definitions, a species is no longer threatened when it is no longer "likely to become an endangered species [*i.e.*, in danger of extinction] within the foreseeable future throughout all or a significant portion of its range." *Id.* § 1532(20), (6).

14. "[T]he same five statutory factors must be considered in delisting as in listing." *Defenders of Wildlife v. Babbitt*, 130 F. Supp. 2d 121, 133 (D.D.C. 2001) (quoting *Fund for Animals v. Babbitt*, 903 F. Supp. 96, 111 (D.D.C. 1995)).

15. 16 U.S.C. § 1533(a)(1). The first three of these factors—habitat loss, overutilization, and predation or disease—are the primary extrinsic drivers of extinction; the fourth factor focuses on the existing regulatory mechanisms available to control the three extinction factors; the final factor is a precautionary catch-all. The inclusion of "natural causes" also demonstrates a congressional conclusion that at-risk species are to be conserved, regardless of the source of the risk.

16. This evaluation is required by the fourth of the five factors that must be assessed in determining the status of the species: "the inadequacy of existing regulatory mechanisms." *Id.* § 1533(a)(1)(D).

invasive species.¹⁷ Such threats generally require ongoing monitoring and conservation management, and neither state nor federal law other than the ESA is likely to provide such protections. Although there are other, broadly applicable statutes that incidentally protect habitat in the process of advancing other objectives (*e.g.*, the Clean Water Act,¹⁸ state fish and game laws, and local zoning regulations), such statutes are unlikely to be sufficient to protect most currently listed species because they do not provide the species-specific, ongoing management that frequently is required. The endangered Kirtland's warbler, for example, requires prescribed burns to maintain appropriate jack-pine habitat structure.¹⁹ Successful recruitment of young into the population by the endangered least Bell's vireo requires controlling brown-headed cowbird parasitism.²⁰ Thus, the very strength of the ESA in preventing extinction becomes a deterrent to delisting a species because to do so can remove the protection needed to conserve it, and thus leads to a downward spiral that would necessitate relisting.

Delisting a species as recovered thus has two distinct elements. The first is *demographic*: the species's population must have increased or at least stabilized to a point at which it is both sufficiently large and dispersed enough to reduce the risk that it will become extinct from

17. One study, for example, found that sixty-percent of the listed species in the United States are imperiled by either disruption of natural fire disturbance regimes or the spread of non-native species. David S. Wilcove & Linus Y. Chen, *Management Costs for Endangered Species*, 12 CONSERVATION BIOLOGY 1405, 1406 (1998). See generally David S. Wilcove et al., *Leading Threats to Biodiversity: What's Imperiling U.S. Species*, in PRECIOUS HERITAGE 239 (Bruce A. Stein et al. eds., 2000); David S. Wilcove et al., *Quantifying Threats to Imperiled Species in the United States: Assessing the Relative Importance of Habitat Destruction, Alien Species, Pollution, Overexploitation, and Disease*, 48 BIOSCI. 607 (1998).

18. 33 U.S.C. §§ 1251–1387 (2000).

19. The species has exacting habitat requirements: extensive, homogenous stands of young jack pines located on poor soils—a habitat type that was more common when forest fires were more common. Fire suppression and habitat fragmentation reduced this habitat and led to the listing of the species. Conserving the species requires regular burning of habitat to produce the requisite stand structure. See U.S. FISH & WILDLIFE SERV., KIRTLAND'S WARBLER RECOVERY PLAN App. B (1985).

20. The brown-headed cowbird has an unusual reproductive strategy: it lays its eggs in the nests of other species, leaving the host to raise the cowbird young. Cowbirds have evolved to have a quick hatch time and to develop rapidly, which allows them to out-compete their fellow nestlings with the result that the host's own young seldom survive. Least Bell's vireo is particularly susceptible to such brood parasitism, and controlling cowbirds is a significant recovery goal for the species. U.S. FISH & WILDLIFE SERV., DRAFT RECOVERY PLAN FOR THE LEAST BELL'S VIREO (*VIREO BELLII PUSILLUS*) 25–28 (1998), available at http://ecos.fws.gov/docs/recovery_plans/1998/980506.pdf.

stochastic events.²¹ The second requirement is *risk-management*: there must be sufficient regulatory or other conservation mechanisms in place to manage the threats facing the species so that it is unlikely to return to an at-risk status.

I. RECOVERY: TWO CASE STUDIES FROM PHASE I

The fifteen species²² that have been delisted as recovered thus far demonstrate that the decision to delist a species has both demographic and risk-management requirements. Until the most recent delistings, at least, the recovered species fell along a continuum defined by the required risk management. At one end are species such as the Aleutian Canada Goose, which can be adequately protected by existing state and federal regulatory mechanisms. At the other end are species, typified by the Robbins' cinquefoil, that require the implementation of ongoing species-specific risk-management programs.

A. *Aleutian Canada Goose*

Most of the species that have been delisted are like the Aleutian Canada goose: their decline was the result primarily of a specific threat and the risk management necessary to delist the species after its population recovered was provided by existing regulatory mechanisms.

21. Biologists generally believe that there are four types of stochastic processes that have a substantial impact on extinction: demographic stochasticity ("chance events in the survival and reproductive success of a finite number of individuals"), environmental stochasticity ("temporal variation of habitat parameters and the populations of competitors, predators, parasites, and diseases"), genetic stochasticity ("changes in gene frequencies due to founder effect, random fixation, or inbreeding"), and natural catastrophes ("floods, fires, droughts, etc., which may occur at random intervals through time"). Mark L. Shaffer, *Minimum Population Sizes for Species Conservation*, 31 *BIOSCI.* 131, 131–32 (1981). These four types of risks are examined in more detail in Hugh P. Possingham et al., *Population Viability Analysis*, in *ENCYCLOPEDIA OF BIODIVERSITY* 831, 832–35 (Simon A. Levin ed., 2001), and in *COMM. ON SCIENTIFIC ISSUES IN THE ENDANGERED SPECIES ACT, NAT'L RESEARCH COUNCIL, SCIENCE AND THE ENDANGERED SPECIES ACT* 124–43 (1995).

22. The species that have been delisted as recovered are the American alligator, brown pelican, Palau fantail flycatcher, Palau ground dove, Palau owl, gray whale, Arctic peregrine falcon, American peregrine falcon, Aleutian Canada goose, Robbins' cinquefoil, Columbia white-tailed deer [Douglas County DPS], Hoover's Woolly-star, Eggert's sunflower, gray wolf [Minnesota population = Western Great Lakes DPS], and grizzly bear [Yellowstone Ecosystem DPS]. The USFWS website lists sixteen species as having been delisted as recovered because it includes not only the Western Great Lakes DPS gray wolf, but also the Minnesota population of gray wolf. See U.S. Fish & Wildlife Service, USFWS Threatened and Endangered Species System (TESS), http://ecos.fws.gov/tess_public/DelistingReport.do (last visited Apr. 7, 2007).

The goose was listed in 1967 as a result of population declines largely attributable to the introduction of a predator (foxes) onto its island nesting grounds.²³ Removal of the foxes from these islands, reintroduction of the species back onto the now fox-free islands, and hunting closures on the species's wintering grounds in Oregon and California allowed the population to rebound from 790 individuals in 1975 to 5800 in 1989 (when it was reclassified as threatened²⁴) to 36,978 in 2000 (just before the species was delisted in 2001²⁵). This population increase reduced the threat to the species from a stochastic event and met the threshold demographic requirement.

Although an increased number of individuals (from 790 to nearly 37,000) and a more widely dispersed population (from one breeding island to twelve) are necessary conditions for recovery, they are not in themselves sufficient. If the ESA is the only regulatory mechanism that is preventing the species from being in danger of extinction, then the species remains at least threatened. Delisting, in other words, requires assurances that the status change itself will not deprive the species of the necessary risk-management mechanisms.²⁶ Thus, the second prong of the inquiry: is there sufficient risk management (*i.e.*, regulatory or other conservation mechanisms) to prevent the species from being at risk of extinction in the foreseeable future?

In the case of the Aleutian Canada goose, the necessary management was found in a group of existing regulatory mechanisms. The threats facing the species arose on its breeding and wintering grounds, and the migration that linked the two. The species nests on islands that are

23. The species was originally listed as endangered in 1967 under a predecessor of the ESA: the Endangered Species Preservation Act (ESPA) of 1966, Pub. L. No. 89-669, 80 Stat. 926, *repealed by* Endangered Species Act, 16 U.S.C. § 1543. *See* Native Fish and Wildlife: Endangered Species, 32 Fed. Reg. 4001 (Mar. 11, 1967). Under the ESPA, the Secretary was not required to discuss the risk factors affecting the species; that discussion can be found in the proposal to reclassify the species from endangered to threatened in 1989. *See* Proposed Reclassification of the Aleutian Canada Goose from Endangered to Threatened, 54 Fed. Reg. 40,142 (Sept. 29, 1989).

24. Proposed Reclassification of the Aleutian Canada Goose from Endangered to Threatened, 54 Fed. Reg. at 40,142.

25. Final Rule to Remove the Aleutian Canada Goose from the Federal List of Endangered and Threatened Wildlife, 66 Fed. Reg. 15,643, 15,645 (Mar. 21, 2001) (to be codified at 50 C.F.R. pt. 17).

26. *See, e.g.*, 16 U.S.C. § 1536(a)(2) ("Each Federal agency shall . . . insure that any action . . . carried out by such agency . . . is not likely to jeopardize the continued existence of any [listed] species."). This provision is applicable to the Secretary of the Interior. *See* Nat'l Wildlife Fed'n v. Norton, 386 F. Supp. 2d 553, 567 (D. Vt. 2005); *Defenders of Wildlife v. Sec'y, U.S. Dep't of the Interior*, 354 F. Supp. 2d 1156, 1173-74 (D. Or. 2005).

within the Alaska Maritime National Wildlife Refuge,²⁷ and the USFWS thus has the authority not only to remove foxes from additional islands, but also to take whatever management actions might be necessary to conserve the species.²⁸ On its wintering grounds, feeding and roosting habitat was acquired either in fee or conservation easements.²⁹ More significantly, the species's status is monitored and take is managed by the federal and state governments through the Pacific Flyway Council,³⁰ established under the Migratory Bird Treaty Act (MBTA).³¹

The gray whale and the American alligator fit the same pattern: they were listed primarily due to a single threat: over-harvesting.³² Following listing and implementation of take prohibitions, the species' populations increased. The risk management necessary to guard against recurrence of the demographic threat posed by over-harvest is, in both cases, provided by a number of existing state, federal, and international regulatory mechanisms.³³

27. See U.S. Fish & Wildlife Service—Alaska, Alaska Maritime National Wildlife Refuge, <http://alaska.fws.gov/nwr/akmar/index.htm> (last visited Jan. 24, 2006).

28. See 16 U.S.C. § 668dd–668ee (2000). See also U.S. Fish & Wildlife Service—Alaska, Wildlife: Alien / Invasive Species, <http://alaska.fws.gov/nwr/akmar/wildlife-wildlands/nonnative/alien.htm> (last visited Jan. 24, 2006).

29. Final Rule to Remove the Aleutian Canada Goose from the Federal List of Endangered and Threatened Wildlife, 66 Fed. Reg. at 15,651–52.

30. The Council is a body established under the Migratory Bird Treaty Act that represents the state fish and game commissions of the western states and provinces. See Pacific Flyway Council, Coordinated Management, <http://pacificflyway.gov/Index.asp> (last visited Sept. 9, 2005). The Council has prepared a management plan for the Aleutian Canada goose. See PACIFIC FLYWAY COUNCIL, PACIFIC FLYWAY MANAGEMENT PLAN FOR THE ALEUTIAN CANADA GOOSE (July 30, 1999), <http://pacificflyway.gov/Abstracts.asp#acg>.

31. 16 U.S.C. §§ 703–711 (2000).

32. See Gray Whale, 58 Fed. Reg. 3121, 3125 (Jan. 7, 1993); Reclassification of American Alligator as Threatened Due to Similarity of Appearance Throughout the Remainder of its Range, 52 Fed. Reg. 21,059, 21,059 (June 4, 1987).

33. The gray whale remains subject to an extensive array of regulatory mechanisms that include ongoing monitoring. At the international level, the species is regulated by the International Whaling Commission under the International Convention for the Regulation of Whaling, Dec. 2, 1946, 10 U.S.T. 952, 161 U.N.T.S. 72, and the Convention on International Trade in Endangered Species of Wild Fauna and Flora, Mar. 3, 1973, 27 U.S.T. 1087, 993 U.N.T.S. 243 (CITES). The species is also protected under federal law when it is within U.S. territorial waters, including, most significantly, the take prohibitions of the Marine Mammal Protection Act, 16 U.S.C. §§ 1361–1407 (2000). Additional federal laws are also applicable and offer additional, though less-focused, protection: the National Environmental Policy Act, 42 U.S.C. §§ 4321, 4331–4335 (2000); the Clean Water Act, 33 U.S.C. §§ 1251–1387 (2000); the Act to Prevent Pollution from Ships, 33 U.S.C. §§ 1901–1909 (2000); the Marine Protection, Research, and Sanctuaries Act, 33 U.S.C. §§ 1401–1447f, 2801–2805 (2000); the Oil Pollution Act of 1990, 33 U.S.C. §§ 2701–2719, 2731–

B. *Robbins' cinquefoil*

For some species, existing regulatory mechanisms are insufficient because the threats they face require more particularized risk-management schemes. A good example is Robbins' cinquefoil, a long-lived, dwarf member of the rose family. Its historical range was restricted to three sites in the White Mountains of New Hampshire and Vermont. At the time of listing, however, the species had been reduced to a single site in New Hampshire that was bisected by the Appalachian Trail; the species's abundance had been substantially reduced due to trampling and habitat destruction caused by hikers.³⁴ This threat differed from that faced by the goose: while removing foxes from an island removed the problem, hikers require continued management.

In delisting the species, the USFWS concluded that the demographic component of recovery had been satisfied because three additional populations of the species had been successfully established and the total number of individuals had increased from less than 2,000 to more than 14,000 specimens in the four separate populations.³⁵ The increased number of individuals and the physical separation of the populations

2738, 2751–2761 (2000); and the Outer Continental Shelf Lands Act Amendments, 43 U.S.C. §§ 1344–1355, 1801–1802, 1841–1845, 1862–1866 (2000).

The alligator continues to be managed pursuant to three federal regulatory mechanisms: the Lacey Act, which prohibits interstate shipment of wildlife taken contrary to state or federal law, 16 U.S.C. §§ 701, 3371–3378 (2000); a special rule promulgated under the ESA's similarity of appearance provisions (since the alligator hides are difficult to distinguish from those of other crocodylians which still are listed), 50 C.F.R. § 17.42 (2004); and listing under Appendix I of CITES, which prohibits international commerce in the species. The USFWS concluded that these "federally enforced laws and regulations . . . require that any harvest options by States meet certain minimum conditions to insure against a recurrence of the original problem which prompted listing, *i.e.*, excessive take." Reclassification of American Alligator as Threatened Due to Similarity of Appearance Throughout the Remainder of its Range, 52 Fed. Reg. at 21,062.

34. Determination of *Potentilla* [sic] *robbinsiana* to Be an Endangered Species, with Critical Habitat, 45 Fed. Reg. 61,944, 61,945 (Sept. 17, 1980) (to be codified at 50 C.F.R. pt. 17). In addition, the species had been the object of intense collection activities: a detailed study found "over 850 plants in herbaria collections worldwide, which represents one of the most extensive collections known for a single species." Removal of *Potentilla robbinsiana* (Robbins' cinquefoil) from the Federal List of Endangered and Threatened Plants, 67 Fed. Reg. 54,968, 54,973 (Aug. 27, 2002) (to be codified at 50 C.F.R. pt. 17). Commercial collecting activities ended in the early 1900s, and scientific collection had also decreased as scientists became more aware of the impacts of their activities. *Id.*

35. Removal of *Potentilla robbinsiana* (Robbins' cinquefoil) from the Federal List of Endangered and Threatened Plants, 67 Fed. Reg. at 54,973.

made the species less susceptible to random, catastrophic events, thus meeting the demographic threshold for delisting the species.³⁶

The risk-management component was satisfied by a series of steps to secure the species's habitat and to provide for the ongoing, biologically relevant management of that habitat. In consultation with the USFWS, the land manager—the U.S. Forest Service (USFS)—and a conservation organization—the Appalachian Mountain Club—had taken several steps to reduce the impact of hikers. The trail was re-routed away from the original population. A wall was constructed and posted with “closed entry” signs. Finally, a series of agreements provided for ongoing risk monitoring and management. The Appalachian Mountain Club agreed to employ a naturalist who would be present during the summer at a hut near the population and, along with other staff at the hut, would monitor human interaction with the population.³⁷ The USFWS and the USFS entered into a memorandum of understanding for the conservation of the species under which the USFS agreed to continue to provide conservation management measures after delisting.³⁸ The risk-management mechanisms developed to protect the cinquefoil thus had both a legal and a biological component: the habitat has been legally protected against adverse human actions and will continue to be managed to meet the biological requirements of the species.

II. RECOVERY: PHASE II

The USFWS's approach to recovery changed with the Millennium.³⁹ The agency has reduced the importance of the demographic component of recovery by operationally redefining the scale of recovery. The most

36. In addition, seed is collected annually for storage in a seed bank. *Id.* at 54,970.

37. *Id.* at 54,970, 54,972–73.

38. The USFS agreed to provide “long-term protection on the Forest irrespective of the species standing under the Endangered Species Act.” U.S. FOREST SERV. AND U.S. FISH & WILDLIFE SERV., MEMORANDUM OF UNDERSTANDING FOR THE CONSERVATION OF ROBBINS' CINQUEFOIL (*POTENTILLA ROBBINSIANA*) 1 (Dec. 2, 1994). The USFWS agreed to maintain the Monroe Flats habitat, to “vigorously protect” the species from take as a result of human disturbance, to train personnel, and to provide educational and interpretational information to visitors to the forest. *Id.* at 3.

39. As the USFWS recently noted, its understanding of what constitutes an “endangered species” and a “threatened species” has changed since 2000. Endangered and Threatened Wildlife and Plants; Clarification of Significant Portion of the Range of the Contiguous United States Distinct Population Segment of the Canada Lynx, 72 Fed. Reg. 1186, 1186 (Jan. 10, 2007).

recent delisting decisions exemplify this shift. They have come in two waves.

A. *Wolves (Round 1)*

The gray wolf was listed as endangered in a series of administrative actions begun under the Endangered Species Preservation Act in 1967.⁴⁰ In 2000, the USFWS proposed to establish four “distinct population segments”⁴¹ (DPSs), one for each of the populations within the

40. See Native Fish and Wildlife; Endangered Species, 32 Fed. Reg. 4001 (Mar. 11, 1967); Conservation of Endangered Species and Other Fish or Wildlife; Amendments to Lists of Endangered Fish and Wildlife, 38 Fed. Reg. 14,678 (June 4, 1973); Endangered and Threatened Wildlife and Plants; Determination That Two Species of Butterflies Are Threatened Species and Two Species of Mammals Are Endangered Species, 41 Fed. Reg. 17,736 (Apr. 28, 1976); Endangered and Threatened Wildlife and Plants; Endangered Status for 159 Taxa of Animals, 41 Fed. Reg. 24,062 (June 14, 1976); Endangered and Threatened Wildlife and Plants; Reclassification of the Gray Wolf in the United States and Mexico, with Determination of Critical Habitat in Michigan and Minnesota, 43 Fed. Reg. 9607 (Mar. 9, 1978). At the end of this process, the species had been listed as endangered throughout its range in the United States and Mexico except in Minnesota and Isle Royale National Park, Michigan, where it was listed as threatened.

41. “Species” was originally defined under the ESA as including “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 interbreeds when mature.” Endangered Species Act of 1973, Pub. L. No. 93-205, § 3(11), 87 Stat. 884, 886 (currently codified as amended at 16 U.S.C. § 1532(16)). The definition was amended in 1978 to include “any subspecies of fish or wildlife or plants, *and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature.*” Endangered Species Act Amendments of 1978, Pub. L. No. 95-632, § 2(5), 92 Stat. 3751, 3752 (currently codified at 16 U.S.C. § 1532(16)) (emphasis added).

The USFWS and NOAA-Fisheries adopted a formal DPS policy in February 1996. Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act, 61 Fed. Reg. 4722 (Feb. 7, 1996). The agencies stated that three elements would be considered in determining whether a population of vertebrates was a DPS: “(1) Discreteness of the population segment in relation to the remainder of the species to which it belongs; (2) The significance of the population segment to the species to which it belongs; and (3) The population segment’s conservation status in relation to the Act’s standards for listing (i.e., is the population segment, when treated as if it were a species, endangered or threatened?).” *Id.* at 4725. The list is sequential in the sense that a population is evaluated under the second element only if it satisfies the first. Similarly, the considerations under each element are disjunctive rather than cumulative.

The discreteness of the population is to be assessed in relation to two conditions: (1) whether the populations are “markedly separated . . . as a consequence of physical, physiological, ecological, or behavioral factors”; *or* (2) an international boundary with differences in “control of exploitation, management of habitat, conservation status, or regulatory mechanisms.” *Id.*

The significance of the population is a highly variable element and “may include, but is not limited to” (1) whether the population persists in an “unusual or unique” ecological setting, (2) whether the loss of the population would result in significant gap in the species’ range, (3) whether the population is the only “natural occurrence” of the species even though the species may be common elsewhere, *or* (4) whether the population “differs markedly . . . in its genetic characteristics.” *Id.*

The evaluation of the status of the population “will be based on the Act’s definitions of

conterminous United States.⁴² Three of the four DPSs (the Western Great Lakes, Western, and Northeastern) were to be reclassified from endangered to threatened (except where the species was listed as an experimental population⁴³); the fourth DPS (the Mexican wolf) was to remain listed as endangered.

With the new Administration came a new and extreme minimalist approach to recovery.⁴⁴ On April 1, 2003, the USFWS delisted and reclassified the species (with the exception of the Mexican wolf) across the conterminous United States.⁴⁵ The method employed was novel. First, the final rule replaced the four proposed DPSs with three: the Eastern, Western, and Southwestern. Second, the agency delisted the species in all areas outside of the newly redefined DPSs. The rationale offered for collapsing the proposed Western Great Lakes DPS and Northeastern DPS into a single Eastern DPS captures the agency's new approach. Although wolves or wolf-like animals have been seen in Maine, New York, and Vermont, and an independent scientific analysis had concluded that there was "sufficient suitable wolf habitat [in] the Adirondack Park region of New York and in Maine and northern New Hampshire," the agency concluded that the "relatively narrow potential dispersal corridors" made the movement of substantial numbers of wolves from Canada into the Northeast unlikely.⁴⁶ Therefore, "the area

[“endangered” and “threatened”] and a review of the [threat] factors enumerated in section 4(a).” *Id.*

42. Endangered and Threatened Wildlife and Plants; Proposal to Reclassify and Remove the Gray Wolf From the List of Endangered and Threatened Wildlife in Portions of the Conterminous United States; Proposal to Establish Three Special Regulations for Threatened Gray Wolves, 65 Fed. Reg. 43,450 (July 13, 2000).

43. Wolves had been reintroduced into central Idaho and Yellowstone National Park in 1994 as nonessential experimental populations. *See* Endangered and Threatened Wildlife and Plants; Establishment of a Nonessential Experimental Population of Gray Wolves in Yellowstone National Park in Wyoming, Idaho, and Montana, 59 Fed. Reg. 60,252 (Nov. 22, 1994); Endangered and Threatened Wildlife and Plants; Establishment of a Nonessential Experimental Population of Gray Wolves in Central Idaho and Southwestern Montana, 59 Fed. Reg. 60,266 (Nov. 22, 1994). *See generally* 16 U.S.C. § 1539(j) (2000).

44. As the USFWS noted in delisting the Eastern DPS, “[a]s with a species or subspecies, a DPS recovery program is not required to seek restoration of the animal throughout the entire geographic area of the listed entity, but only to the point at which it no longer meets the definition of a threatened or endangered species.” Endangered and Threatened Wildlife and Plants; 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 (Apr. 1, 2003) (to be codified at 50 C.F.R. pt. 17).

45. *Id.*

46. *Id.* at 15,814.

in the western Great Lakes States where the wolf currently exists represents *the entire range* of the species within the Eastern DPS.”⁴⁷ Because the number of individual wolves in the western Great Lakes states exceeded the recovery plan’s goals for the Great Lakes recovery zone,⁴⁸ the agency concluded that the species should no longer be classified as endangered “in the Eastern DPS.”⁴⁹ Therefore, “[b]ecause gray wolf recovery in the *eastern* United States can be achieved by restoring the species in Minnesota, Wisconsin, and Michigan, we do not intend to undertake wolf recovery programs in other areas of the Midwest.”⁵⁰

That is, the agency defined the Eastern DPS to include both the upper Midwest and all of the eastern United States above the Mason-Dixon Line. In much of this area, wolves were transients, potentially recolonizing suitable habitat.

Within this redefined DPS, wolves were found primarily in the three states in the upper Midwest. In these states, the number of individuals exceeded the population targets in the recovery plan for Great Lakes recovery zone. Thus, because the species (recall that “species” is the DPS) was not at risk of extinction in its range in Minnesota, Wisconsin, and Michigan, it was no longer at risk of extinction “throughout all or a significant portion of its range”⁵¹ in the DPS, and could be delisted “within the States of North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa, Missouri, Wisconsin, Illinois, Michigan, Indiana,

47. *Id.* at 15,810 (emphasis added).

48. The recovery plan specified two demographic recovery goals: (1) a secure population of wolves in Minnesota, and (2) a Wisconsin-Michigan population of 100 wolves for five consecutive years. Endangered and Threatened Wildlife and Plants; Proposal to Reclassify and Remove the Gray Wolf From the List of Endangered and Threatened Wildlife in Portions of the Conterminous United States; Proposal to Establish Three Special Regulations for Threatened Gray Wolves, 65 Fed. Reg. at 43,454–55. *See also* Endangered and Threatened Wildlife and Plants; 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. at 15,810.

49. Endangered and Threatened Wildlife and Plants; 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. at 15,810.

50. *Id.* at 15,815 (emphasis added).

51. The phrase comes from the ESA’s definitions of “threatened” (“likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range,” 16 U.S.C. § 1532(20)) and “endangered” (“in danger of extinction throughout all or a significant portion of its range,” *id.* § 1532(6)).

Ohio, Pennsylvania, New Jersey, New York, Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire, and Maine.”⁵²

The agency’s minimalist approach to recovery was built upon a formalistic, definitional foundation. Consider the explanation of the “conservation and recovery” of the newly defined Western DPS:

The gray wolf’s substantial success in meeting the revised recovery criteria for the Northern Rocky Mountains area ensures the wolf’s long-term survival within its range in the Western DPS (*i.e.*, the area inhabited by the metapopulation of gray wolves in the Northern Rocky Mountains). We conclude, based on the wolf’s recovery progress, and on our assessment of the threats that will remain once the wolf is reclassified as threatened . . . that the gray wolf is not in danger of extinction throughout its range within the Western DPS. Because . . . there is no other population of wolves within the DPS, this conclusion applies to all parts of the wolf’s range in the DPS, and so we also conclude that the wolf is not in danger of extinction within any significant portion of its range in the DPS. The gray wolf is no longer endangered throughout all or a significant portion of its range in the Western DPS.⁵³

This semantic sleight-of-hand plays with the terms in the ESA’s risk assessment standards. The agency relied on the combination of narrowly defining “range” (as only the currently occupied area⁵⁴) and expansively

52. Endangered and Threatened Wildlife and Plants; Removing the Eastern Distinct Population Segment of Gray Wolf From the List of Endangered and Threatened Wildlife, 68 Fed. Reg. 15,876, 15,876 (Apr. 1, 2003). The Notice suggests that the agency’s statement that “we do not intend to undertake wolf recovery programs in other areas of the Midwest,” was either disingenuous or reflects an expansive view of the Midwest that New Englanders might find curious. Endangered and Threatened Wildlife and Plants; 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. at 15,815.

53. Endangered and Threatened Wildlife and Plants; 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. at 15,810–11. The agency also published an Advance Notice of Proposed Rulemaking to delist the species in “California, Idaho, Montana, Nevada, Oregon, Washington, Wyoming, Utah north of U.S. Highway 50, and Colorado north of Interstate Highway 70.” Endangered and Threatened Wildlife and Plants; Removing the Western Distinct Population Segment of Gray Wolf From the List of Endangered and Threatened Wildlife, 68 Fed. Reg. 15,879, 15,880 (Apr. 1, 2003).

54. The agency noted in passing that “the area in the western Great Lakes States where the wolf currently exists represents the entire range of the species within the Eastern DPS.” Endangered and Threatened Wildlife and Plants; Final Rule to Reclassify and Remove the Gray Wolf from the List of Endangered and Threatened Wildlife in Portions of the Conterminous United States;

defining the DPS (to include areas where wolves were not present or were present only in small numbers) to conclude that “the gray wolf is not in danger of extinction throughout its range within the Western DPS.”⁵⁵ Because it is not in danger within its range, it is by definition also “not in danger of extinction within any significant portion of its range in the DPS.”⁵⁶ Therefore, it is no longer endangered and the Act’s protection of individuals colonizing their former range (such as the New England states and the North Cascades in Washington) may be removed.

Not surprisingly, federal district courts in Vermont and Oregon held the agency’s action to be a violation of the ESA.⁵⁷ The Vermont court commented that the agency’s decisions were inconsistent with the “overarching purpose of the ESA—protect a species and its habitat from extinction. The FWS simply cannot downlist or delist an area that it previously determined warrants an endangered listing because it ‘lumps together’ a core population with a low to non-existent population outside of the core area.”⁵⁸ The viability of a species in one part of its historic range does not render everything else insignificant. As the court in Oregon noted, “wolves in Washington receive less protection under the Final Rule, even though nothing has changed in that area to justify less protection.”⁵⁹ The court concluded that “the wolf DPS appears to be a tactic for downlisting areas . . . despite the unabated threats and low to nonexistent populations outside of the core areas.”⁶⁰

The agency’s error was to delist wolves in an entire region (such as the northeastern quarter of the country) because a population in one part of the region (the upper Midwest) had met stated recovery goals. The court held this to be illegal because the New England wolves were still at risk despite the presence of a recovered population of wolves in the upper Midwest.⁶¹ The agency made the same error in lumping the wolves of Washington with the wolves of the Rocky Mountains.

Establishment of Two Special Regulations for Threatened Gray Wolves, 68 Fed. Reg. at 15,810. *Cf. id.* at 15,810 (similar statement in regard to the Western DPS).

55. *Id.* at 15,810–11.

56. *Id.*

57. *See Nat’l Wildlife Fed’n v. Norton*, 386 F. Supp. 2d 553 (D. Vt. 2005); *Defenders of Wildlife v. Norton*, 354 F. Supp. 2d 1156 (D. Or. 2005).

58. 386 F. Supp. 2d at 565 (citations omitted).

59. 354 F. Supp. 2d at 1171.

60. *Id.* at 1171.

61. 386 F. Supp. 2d at 565.

The agency tried again.

B. Wolves and Grizzly Bears (Round 2)

In March 2006, the USFWS proposed to designate the Western Great Lakes population of wolves as a DPS and to delist the population as recovered.⁶² The proposal was finalized on February 8, 2007.⁶³ The DPS was substantially reduced in size—it no longer included New England, New York, or Pennsylvania.⁶⁴ While abandoning its attempt to delist the species throughout the Northeast, the agency continued to pursue its minimalist recovery objectives through formalist logic.

As the second attempt to delist the wolf was moving forward, the USFWS also proposed to delist one population of grizzly bear.⁶⁵ At the end of 2005, USFWS—following the pattern established with the wolf—proposed to establish a DPS in the Greater Yellowstone Area (GYA) and to delist the DPS as recovered.⁶⁶ The rule was finalized and the species was delisted on March 29, 2007.⁶⁷

Between these two delistings, the Solicitor issued an opinion on the meaning of the phrase “throughout all or a significant portion of its

62. Endangered and Threatened Wildlife and Plants; Designating the Western Great Lakes Population of Gray Wolves as a Distinct Population Segment; Removing the Western Great Lakes Distinct Population Segment From the List of Endangered and Threatened Wildlife, 71 Fed. Reg. 15,266 (Mar. 27, 2006).

63. Endangered and Threatened Wildlife and Plants; Final Rule Designating the Western Great Lakes Populations of Gray Wolves as a Distinct Population Segment; Removing the Western Great Lakes Distinct Population Segment of the Gray Wolf from the Federal List of Endangered and Threatened Wildlife, 72 Fed. Reg. 6052 (Feb. 8, 2007) [hereinafter *Wolf Delisting*].

64. *Id.*

65. Endangered and Threatened Wildlife and Plants; Designating the Greater Yellowstone Population of Grizzly Bears as a Distinct Population Segment; Removing the Yellowstone Distinct Population Segment of Grizzly Bears from the Federal List of Endangered and Threatened Wildlife; Proposed Rule, 70 Fed. Reg. 69,854 (Nov. 17, 2005). The grizzly bear was listed as threatened on July 28, 1975. Endangered and Threatened Wildlife: Grizzly Bear, 40 Fed. Reg. 31,733 (July 28, 1975).

66. Endangered and Threatened Wildlife and Plants; Designating the Greater Yellowstone Population of Grizzly Bears as a Distinct Population Segments; Removing the Yellowstone Distinct Population Segment of Grizzly Bears from the Federal List of Endangered and Threatened Wildlife; Proposed Rule, 70 Fed. Reg. at 69,854.

67. Endangered and Threatened Wildlife and Plants; Final Rule Designating the Greater Yellowstone Area Population of Grizzly Bears as a Distinct Population Segment; Removing the Yellowstone Distinct Population Segment of Grizzly Bears From the Federal List of Endangered and Threatened Wildlife; 90-Day Finding on a Petition to List as Endangered the Yellowstone Distinct Population Segment of Grizzly Bears, 72 Fed. Reg. 14,866 (Mar. 29, 2007) [hereinafter *Bear Delisting*].

range.”⁶⁸ The three documents—as well as a number of decisions not to list species⁶⁹—share surface similarities given their discussion of “range” and “significant portion of its range.” These similarities, however, are misleading: the Solicitor’s Opinion embodies a much broader and more nuanced understanding of the Act than the minimalist approach that underpins the USFWS’s implementation of the risk-assessment mandate.

Recall that both standards for assessing a species’s risk of extinction—the statutory definitions of “endangered” and “threatened”—specify that the relevant geographical scale is “throughout all or a significant portion of its range.”⁷⁰ This phrase has two terms that are potentially ambiguous: “range” and “significant.”

1. “Range”

The first step in both the Solicitor’s and the USFWS’s analysis is the formal definition of the term “range”: “[t]he word ‘range’ . . . refers to the range in which a species currently exists, not to the historical range of the species where it once existed.”⁷¹ Although this has proved controversial,⁷² the concerns—at least as applied to the Solicitor’s

68. SOLICITOR’S OPINION M-37013 at 1 (Mar. 16, 2007), <http://www.doi.gov/solicitor/M37013.pdf> [hereinafter *Solicitor’s Opinion*].

69. See *Endangered and Threatened Wildlife and Plants; Clarification of Significant Portion of the Range for the Contiguous United States Distinct Population Segment of the Canada Lynx*, 72 Fed. Reg. 1186, 1186 (Jan. 10, 2007); *Endangered and Threatened Wildlife and Plants; 90-Day Finding on a Petition to List the Columbian Sharp-Tailed Grouse as Threatened or Endangered*, 71 Fed. Reg. 67,318 (Nov. 21, 2006); *Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition To List the Northern Mexican Gartersnake (Thamnophis eques megalops) as Threatened or Endangered with Critical Habitat*, 71 Fed. Reg. 56,228 (Sept. 26, 2006); *Endangered and Threatened Wildlife and Plants; Final Listing Determination for the Gunnison Sage-Grouse as Threatened or Endangered; Final Rule*, 71 Fed. Reg. 19,954 (Apr. 18, 2006).

70. 16 U.S.C. § 1532(6), (20).

71. *Wolf Delisting*, *supra* note 63, at 6069; *Bear Delisting*, *supra* note 67, at 14,910. See also *Solicitor’s Opinion*, *supra* note 68, at 8 (“‘range’ must mean ‘current range,’ not ‘historical range’”). This definition is predicated on the argument that the phrase “in danger of extinction” in the Act’s definition of “endangered” is “a present-tense condition of being at risk of a future, undesired event.” *Wolf Delisting*, *supra* note 63, at 6069; *Bear Delisting*, *supra* note 67, at 14,910; *Solicitor’s Opinion*, *supra* note 68, at 7. Because being “in danger” in an unoccupied area is “inconsistent with common usage,” the term “range” can only mean “currently-occupied range.” *Wolf Delisting*, *supra* note 63, at 6069; *Bear Delisting*, *supra* note 67, at 14,910; see also *Solicitor’s Opinion*, *supra* note 68, at 7–8.

72. See John Flesher, *Scientists Protest New Reading of ESA*, WASH. POST, May 2, 2007, available at http://www.washingtonpost.com/wp-dyn/content/article/2007/05/01/AR2007050101714_pf.html. The concern expressed appears to be a

Opinion—appear misplaced. The problem is not the Solicitor’s definition of “range”; it is the USFWS’s application of “significant” to achieve results that lack *biologic*.

Recall that a decision to list, reclassify, or delist a species requires an assessment of the risk of extinction that the species faces—is it either endangered or threatened? This risk assessment focuses on whether the species is foreseeably at risk of extinction.⁷³ The fact that a species’s distribution has been substantially reduced does not *in and of itself* mean that the species is at risk of extinction—just as the fact that a species occupies all of its historic range and is present in historic numbers does not mean that the species is not at risk.⁷⁴ The issue is whether the species is at risk because of the presence of one or more threats to its continued existence. The fact that the species’s historic range has been substantially reduced *is* relevant to the question of its present status. As the Solicitor commented, “[d]ata about the historical range and how the species came to be extinct in that location may be relevant in understanding or predicting whether a species is ‘in danger of extinction’ in its present range.”⁷⁵ Indeed, the evaluation of habitat loss is required by the threat factors that the agency is to employ in making its assessment of the species’s risk of extinction⁷⁶—and often, the fact that a species’s range has been substantially reduced will support the conclusion that it is currently at risk of extinction because smaller, less dispersed populations face greater risks as a result of their reduced numbers and range. Such was the case with Robbin’s cinquefoil: the fact that it had been reduced to a single population was support for the conclusion that it was currently endangered given the threats to that population.⁷⁷ But the crucial point is that the fact that the species no

reflection of the USFWS’s use of “significant” as a tool for the type of over-reaching decision that was involved in the attempt to delist the Eastern DPS of gray wolf.

73. Section 4(a)(1) specifies that “[t]he Secretary shall . . . determine whether any species is an endangered species or a threatened species . . . as a result of” the five, previously noted threat factors. 16 U.S.C. § 1533(a)(1) (2000).

74. *See, e.g.*, Emergency Determination of Endangered Status and Critical Habitat for the Borax Lake Chub, 45 Fed. Reg. 35,821 (May 28, 1980) (listing the Borax Lake chub because of threats from geothermal development and irrigation diversions despite the fact that it still occupied its historic range in historic numbers).

75. *Solicitor’s Opinion*, *supra* note 68, at 8.

76. The agency must consider “the *present* or threatened destruction, modification, or *curtailment* of its habitat or range.” 16 U.S.C. § 1533(a)(1)(A) (emphasis added).

77. Determination of *Pontententilla* [sic] *robbinsiana* to Be an Endangered Species, with Critical Habitat, 45 Fed. Reg. 61,944, 61,945 (Sept. 17, 1980).

longer exists in some of its former range does not mean—*by that fact alone*—that it is at risk of extinction.

Recall also the agency’s error in the first round of its attempts to delist the “Eastern DPS” of gray wolf: it lumped the wolves in New England with the wolves in the upper Midwest and sought to delist the New England wolves because the wolves in the upper Midwest had met the stated recovery goals. The court held this to be illegal because the New England wolves were still at risk despite the presence of wolves in the upper Midwest.⁷⁸ It is equally erroneous to conclude the opposite. Unless the species’s extirpation in New England provides support for the conclusion that it is—*for that reason*—also at risk of extinction in the upper Midwest, the fact that the gray wolf has been extirpated from New England does not *in itself* mean that the species is at risk of extinction in the upper Midwest. But again, the fact that there are wolves in the upper Midwest does not mean that the species is recovered in New England. They are, after all, *currently* two separate populations in different portions of the species’s historic range.

Are those portions “significant”?

2. “Significant Portion of Its Range”

In defining “significant,” the Solicitor noted that “significant” has at least two distinguishable meanings: “important” and “a noticeably or measurably large amount.”⁷⁹ Given these differing meanings, the term is ambiguous and, therefore, “the Secretary has broad discretion to resolve the ambiguity and give meaning to the term.”⁸⁰ It is at this point that the superficial similarities among the Solicitor’s Opinion and the USFWS decisions obscure fundamental differences.

The Solicitor begins his analysis by noting that, while the Secretary has “broad discretion,” that discretion is bounded by the “primary stated purposes of the ESA.”⁸¹ The Opinion emphasizes two objectives. The first is the Act’s statement of purpose: “to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, [and] to provide a program for the

78. 386 F. Supp. 2d at 565.

79. *Solicitor’s Opinion*, *supra* note 68, at 9; *see also Bear Delisting*, *supra* note 67, at 14,910; *Wolf Delisting*, *supra* note 63, at 6070.

80. *Solicitor’s Opinion*, *supra* note 68, at 10.

81. *Id.* at 11.

conservation of such endangered species and threatened species.”⁸² The Opinion also cites the purpose of these conservation objectives: “these species of fish, wildlife, and plants are of esthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people.”⁸³ Thus, in determining whether part of a species’s range is significant, the USFWS is bound by the Act’s objective of conserving at-risk species and ecosystems and can consider the values that would be impaired or lost if the species became extinct in part of its range.

This approach reflects both the legislative history of the Act and its early implementation. The American alligator played a role in both. On the floor of the Senate, the bill’s manager, Senator John Tunney—citing the alligator as his example—noted that the bill was sufficiently flexible to permit a species to be listed as threatened in one state while it was hunted in part of another.⁸⁴ The alligator’s listing history also reflects this understanding of the agency’s authority. The species was listed as endangered in March 1967,⁸⁵ under the Endangered Species Preservation Act of 1966 (ESPA).⁸⁶ It subsequently was reclassified under the ESA either as threatened or as “threatened due to similarity of appearance” (*i.e.*, “recovered”) between 1975 and 1987 in various jurisdictionally defined parts of its range.⁸⁷ The ESA thus authorizes the Secretary to list

82. *Id.* (quoting 16 U.S.C. § 1531(b)).

83. *See id.* (quoting 16 U.S.C. § 1531(a)(3)).

84. Senator Tunney explained this conclusion in a statement before the Senate Committee on Environment and Public Works:

A well-known example may serve to illustrate how S. 1983 provides for maximum management and conservation discretion, while insuring absolute protection for species imminently in danger of extinction. The American alligator, which has been plagued by habitat destruction and commercial exploitation, is currently listed as an endangered species [under the Endangered Species Conservation Act of 1969]. However, due to increased population resulting in habitat destruction, the Louisiana Wildlife and Fisheries Commission ended total protection last year and conducted a closely regulated harvest in one parish of the State. According to the Department of the Interior, it is likely that in certain portions of Louisiana, the American alligator may be relisted under this bill as a threatened species. S. 1983 would permit continued State action to enhance the existence of this species. In other areas the alligator would remain listed as an endangered species and would be entitled to absolute Federal or State protection.

119 CONG. REC. 25,669–70 (July 24, 1973) (statement of Sen. Tunney), *reprinted in* SENATE COMM. ON ENVIRONMENT & PUBLIC WORKS, 97TH CONG., 2D SESS., A LEGISLATIVE HISTORY OF THE ENDANGERED SPECIES ACT OF 1973, AS AMENDED IN 1976, 1977, 1978, 1979, AND 1980 at 360 (Comm. Print 1982) (prepared by Congressional Research Service, Library of Congress).

85. Native Fish and Wildlife; Endangered Species, 32 Fed. Reg. 4001 (Mar. 11, 1967).

86. Endangered Species Preservation Act of 1966, Pub. L. No. 89-669, 80 Stat. 926, *repealed by* Endangered Species Act of 1973, Pub. L. No. 93-205, § 14, 87 Stat. 884, 903 (1973)).

87. U.S. Fish & Wildlife Service, Reclassification of American Alligator as Threatened Due to

and delist groups smaller than species, as that term was defined in the Act,⁸⁸ and to do so along jurisdictional as well as other significant boundaries.

The Solicitor thus concluded: first, that the USFWS had the authority to adjust the degree of protection accorded a species by the degree of threat that the species faced in different portions of its range. A population that is at risk in part of its range can be listed while other populations remain unprotected.⁸⁹ Furthermore, the opinion notes that “significance” embodies an expansive sweep of concerns—including the “esthetic, ecological, educational, historical, recreational, and scientific” value of the species and its populations,⁹⁰ as well as differences in the degree of protection accorded a species in different states. Thus, portions of the range occupied by a population can be significant in various ways. For example, the woodland caribou’s current range extends into the United States from Canada less than fifty miles along the Selkirk Mountains of northern Idaho and northeastern Washington. The fact that

Similarity of Appearance Throughout the Remainder of its Range, 52 Fed. Reg. 21,059 (June 4, 1987); Reclassification of the American Alligator in Florida to Threatened Due to Similarity of Appearance, 50 Fed. Reg. 25,672 (June 20, 1985); Reclassification of the American Alligator in the State of Texas, 48 Fed. Reg. 46,332 (Oct. 12, 1983); Reclassification of the American Alligator in Louisiana, 46 Fed. Reg. 40,664 (Aug. 10, 1981); Reclassification of the American Alligator in Nine Parishes in Louisiana, 44 Fed. Reg. 37,130 (June 25, 1979); Reclassification of the American Alligator to Threatened Status in Certain Parts of Its Range, 42 Fed. Reg. 2071 (Jan. 10, 1977); Reclassification of the American Alligator and other Amendments, 40 Fed. Reg. 44,412 (Sept. 26, 1975).

A second example is the “southern bald eagle,” which was also listed as endangered in March 1967. Native Fish and Wildlife: Endangered Species, 32 Fed. Reg. 4001, 4001 (Mar. 11, 1967). Following enactment of the ESA, USFWS listed the species as endangered throughout the conterminous 48 states except in Washington, Oregon, Minnesota, Wisconsin, and Michigan where it was listed as threatened. Determination of Certain Bald Eagle Populations as Endangered or Threatened, 43 Fed. Reg. 6230 (July 12, 1978). The gray wolf provides a third example. The species was listed as endangered throughout its range in the conterminous United States and Mexico except in Minnesota and Isle Royale National Park, Michigan, where it was listed as threatened. Endangered and Threatened Wildlife and Plants; Reclassification of the Gray Wolf in the United States and Mexico, with Determination of Critical Habitat in Michigan and Minnesota, 43 Fed. Reg. 9607 (Mar. 9, 1978).

88. “Species” includes subspecies and distinct population segments of vertebrates. 16 U.S.C. § 1532(16).

89. The Solicitor concluded that “if the Secretary determines that a species is in danger of extinction in a significant portion of its range, he must specify the portion of its range where it is an endangered species and then apply the protections in the Act to the members of the species in that portion of its range.” *Solicitor’s Opinion*, *supra* note 68, at 7. The agency thus has the responsibility to list “populations”—including, presumably, populations of invertebrates—that are at risk in only part of their range if that part is “significant.”

90. 16 U.S.C. § 1531(a)(3).

this is the only population in the United States makes it of particular value to “the Nation and its people.”⁹¹ If there were a population of grizzly bears in California, that population would have a significant symbolic value because the bear is found on the state’s flag—the justification that was offered in 1940 when Congress took steps to protect the bald eagle as “a symbol of the American ideals of freedom.”⁹²

3. *USFWS Implementation: A One-Way Ratchet*

The USFWS has adopted a one-dimensional approach to the term “significant.” The agency has stated that application of the term must be determined on a case-by-case basis that requires consideration of the quality, quantity, and distribution of habitat relative to the biological requirements of the species; the historical value of the habitat to the species; the frequency of use of the habitat; the uniqueness or importance of the habitat for other reasons, such as breeding, feeding, migration, wintering, or suitability for population expansion; genetic diversity; and other biological factors.⁹³

This approach is problematic. Although species are parts of larger systems, the agency’s approach fails to consider the species’s role in the ecosystems that the Act also requires to be conserved. The result is that the agency’s continued advocacy of a minimalist approach is hidden behind what is offered as a biologically based standard. In both the wolf and bear delistings, the USFWS has shifted its historic approach to the demographic component of recovery by abandoning the requirement that there must be more than a single population or that any single population must be widely dispersed. In its place, the agency has adopted a strategy that seeks to protect only core areas while consigning peripheral populations to extinction.⁹⁴

91. 16 U.S.C. § 1531(a)(3).

92. 16 U.S.C. § 668 note (2000). *Cf.* The Case of Swans, 7 Co. Rep. 15b, 77 Eng. Rep. 435 (K.B. 1592) (the king owns swans because they are the most perfect fowl).

93. *Bear Delisting*, *supra* note 67, at 14,911; *Wolf Delisting*, *supra* note 63, at 6070.

94. *See, e.g.*, Endangered and Threatened Wildlife and Plants; 90-Day Finding on a Petition to List the Columbian Sharp-Tailed Grouse as Threatened or Endangered, 71 Fed. Reg. 67,318, 67,321, 67,324 (Nov. 21, 2006) (while agreeing with the petitioners that “most of the subspecies’ small, isolated populations may be extirpated within 10 to 20 years due to existing threats and current management scenarios,” the agency nonetheless concluded that the loss of these populations did not mean that the *species* was at risk of extinction).

For example, the USFWS began its analysis of the wolf's recovery by noting that "[i]t is generally recognized that Minnesota, Wisconsin, and Michigan provide the only sufficiently large areas in the Midwest having an adequate wild ungulate prey base and low road and human density" to support wolves.⁹⁵ The agency then reviewed the region's three existing populations—the first in Minnesota, the second in northern Wisconsin and the Upper Peninsula of Michigan, and the third in the Lower Peninsula of Michigan.⁹⁶ While acknowledging that the Lower Peninsula "appears to have the only unoccupied potentially suitable wolf habitat in the Midwest that is of sufficient size to maintain wolf packs,"⁹⁷ the agency nonetheless concluded that this area was not a "significant portion" of the DPS's range because it might require continuing immigration from the Upper Peninsula to maintain a population of wolves.⁹⁸ Thus, the agency reasoned, although the Upper Peninsula wolves "may be significant to any Lower Peninsula wolf population that may develop . . . the reverse will not be true—Lower Peninsula wolves would not be important to the wolf population in the [Upper Peninsula]."⁹⁹

That is, wolves in the upper Midwest occupy three interconnected areas: (1) northern and eastern Minnesota, (2) northern Wisconsin and the Upper Peninsula of Michigan, and (3) the Lower Peninsula of Michigan. Not all of this range is significant—most notably, the existing range on the Lower Peninsula is not. As a result, "[t]hreats to those habitat areas that are not a [significant portion of the species's range], will not adversely impact the recovered wolf metapopulation in the DPS."¹⁰⁰ These areas—and the wolves that occupy them—thus do not need to be protected following delisting, and the loss of the population will not trigger relisting. The wolves in the Lower Peninsula are expendable.

The delisting document for the grizzly bear has a set of interlocking definitions that lead to the same conclusion. The agency began with "suitable habitat," which it defined as "the area within the DPS

95. *Wolf Delisting*, *supra* note 63, at 6073.

96. *Id.* at 6053–56, 6073.

97. *Id.* at 6073.

98. Wolves from the Upper Peninsula might be required to "provide important genetic and demographic augmentation crucial to a small population founded by only a few individuals." *Id.*

99. *Id.*

100. *Id.* at 6076.

boundaries capable of supporting a viable grizzly bear population now or in the foreseeable future.”¹⁰¹ Although this sounds biologically based, the third definitional criterion for suitability is “low mortality risk,” a euphemism for minimizing human-bear interactions.¹⁰² Thus, for example, sheep grazing is a land use that leads to high bear mortality. As a result, although sheep—unlike grizzly bears—can be raised almost anywhere, sheep allotments on National Forest Lands were excluded from suitable habitat.¹⁰³ The agency then defined “significant portion of its range” to include only “suitable habitat”¹⁰⁴—which led it to conclude that the unsuitable habitat was “not ‘significant’ to the conservation of the species and does not constitute a significant portion of range. A lack of occupancy in unsuitable habitat will not impact whether this population is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.”¹⁰⁵ Thus, by definition, there is no need to protect bears in such areas—and their high mortality rates in these areas can be expected to continue.

The agency has employed the same reductive logic in refusing to list species. For example, the USFWS determined that three of the four regions in which lynx occur “[c]ollectively . . . do not constitute a significant portion of the lynx DPS.”¹⁰⁶ Thus, the species need not be protected in the Northeast, Great Lakes, or southern Rocky Mountains despite its rarity in these regions; the agency proposes to conserve the species under the ESA only in the northern Rocky Mountains/Cascade Mountains.¹⁰⁷ Its rationale for the decision is that the habitat of the Northeast, Great Lakes, or southern Rocky Mountains is of varying quality and thus is incapable of supporting stable or expanding

101. *Bear Delisting*, *supra* note 67, at 14,912.

102. *Id.*

103. *Id.* at 14,912–13.

104. *Id.* at 14,913.

105. *Id.* at 14,914.

106. Endangered and Threatened Wildlife and Plants; Clarification of Significant Portion of Range for the Contiguous United States Distinct Population Segment of the Canada Lynx, 72 Fed. Reg. 1186, 1186 (Jan. 10, 2007). It is interesting to note that the distribution of wolves and lynx in both the United States and Canada are broadly similar. The USFWS, however, has repeatedly sought to characterize the wolves in the different geographic areas (the Northeast, Great Lakes, and Rocky Mountains/Cascade Mountains) as DPSs to facilitate delisting of the species while treating the lynx in these areas as a single DPS to buttress its decision narrowly restricting the areas where the species is effectively protected.

107. *Id.* at 1186–89.

populations. In other words, only areas that can support stable populations are “significant”—a rationale that assumes a stability of habitat that seems inconsistent with a dynamic world, particularly in a time of climate change. This approach forecloses recolonization of habitat.

Ultimately, the difficulty with the agency’s rationale is more than a difference in policy. The agency’s approach lacks *biological* logic.¹⁰⁸

4. *So what?*

“Successful biodiversity conservation comes down to this: *Save some of everything, save enough to last.*”¹⁰⁹ This basic principle is often expressed as representation (save some of everything), resilience (save enough so that it is not prone to failure), and redundancy (save enough to provide back ups).¹¹⁰ The agency’s minimalist approach to recovery fails to satisfy these standards because it conflates preventing extinction (viability) with recovery.¹¹¹

The decisions in both the wolf and grizzly delistings demonstrate this problem. The fundamental decision in both is that peripheral populations can be extirpated as long as some wolves and bears remain in a core area. In responding to a comment noting that grizzly bears have “negative growth rates” outside the core conservation area in Yellowstone National Park (the PCA), the agency stated that this was biologically irrelevant because it believed that a surplus number of bears would continue to be produced within the PCA.¹¹² Similarly, the population of wolves in the lower peninsula of Michigan was expendable because those wolves “might have difficulty maintaining wolf populations even with the help of occasional immigration of wolves

108. *See, e.g.,* Defenders of Wildlife v. Norton, 239 F. Supp. 2d 9, 19 (D.D.C. 2002) (“[The USFWS] argument that a species is not ‘significant’ under the ESA because it is naturally rare, has no foundation in the statute, and is . . . contrary to the ESA’s broad purpose to protect wildlife that is ‘in danger of or threatened with extinction.’”).

109. Mark L. Shaffer & Bruce A. Stein, *Safeguarding Our Precious Heritage*, in PRECIOUS HERITAGE 301, 307 (Bruce A. Stein et al. eds., 2000).

110. *Id.* *See also* CRAIG R. GROVES ET AL., DRAFTING A CONSERVATION BLUEPRINT (2003).

111. “[T]he ESA was enacted not merely to forestall the extinction of species . . . but to allow a species to recover to the point where it may be delisted.” *Gifford Pinchot Task Force v. U.S. Fish & Wildlife Serv.*, 378 F.3d 1059, 1070 (9th Cir. 1974); *see id.* at 1069–71; *see also* *N.M. Cattle Growers Ass’n v. U.S. Fish & Wildlife Serv.*, 248 F.3d 1277, 1283 (10th Cir. 2001); *Sierra Club v. U.S. Fish & Wildlife Serv.*, 245 F.3d 434, 441–42 (5th Cir. 2001).

112. *Bear Delisting*, *supra* note 67, at 14,883.

from the [upper peninsula].”¹¹³ Although all areas within a species’s range may not be equally biologically “significant”—indeed, the patchiness of habitat is one of the fundamental tenets of landscape ecology¹¹⁴—the agency’s approach is problematic for at least six reasons.

First, it is the peripheral populations of a species that provide biological and genetic options. For example, these populations are at the edge of the species’s range and thus often subject to different evolutionary pressures. The loss of options is particularly troubling during periods (such as the present) of rapid ecological change. As one review of the importance of peripheral populations to the conservation of at-risk species concluded, “[w]hat constitutes a peripheral population today could be the center of a species’s range in the future.”¹¹⁵ Moreover—and contrary to the seeming logic of the situation—peripheral populations are more likely to survive than core populations when a species undergoes substantial reductions in range.¹¹⁶ Reliance on a conservation strategy that accepts the extirpation of peripheral populations is thus less resilient—it simply puts too many eggs in one basket.

Second, a core-area conservation strategy also isolates populations and thus enhances the potential for genetic stochasticity.¹¹⁷ The GYA grizzly bear population, for example, has a lower genetic variability than the nearest population north of the Park.¹¹⁸ Although the agency acknowledged this problem and the fact that the habitat-linkage task in the recovery plan had not been met, it nonetheless concluded that this

113. *Wolf Delisting*, *supra* note 63, at 6073.

114. E.g., John A. Wiens, *Metapopulation Dynamics and Landscape Ecology*, in *METAPOPULATION BIOLOGY* 43, 44–47 (Ilkka Hanski & Michael L. Gilpin eds., 1997).

115. Jennifer L. Nielson et al., *Endangered Species Conservation and Peripheral Populations: Cause for Conservation*, 18 *ENDANGERED SPECIES UPDATE* 194, 194 (2001).

116. Rob Channell & Mark V. Lomolino, *Dynamic Biogeography and Conservation of Endangered Species*, 403 *NATURE* 84 (2000); Love Dalen et al., *Ancient DNA Reveals Lack of Postglacial Habitat Tracking in the Arctic Fox*, 104 *PROC. NAT’L ACAD. SCIS.* 6726 (2007).

117. Genetic stochasticity involves “changes in gene frequencies due to founder effect, random fixation, or inbreeding.” Shaffer, *supra* note 21, at 131–32.

118. *Bear Delisting*, *supra* note 67, at 14,878, 14,926; Craig R. Miller & Lisette P. Waits, *The History of Effective Population Size and Genetic Diversity in the Yellowstone Grizzly* (*Ursus arctos*): *Implications for Conservation*, 100 *PROC. NAT’L ACAD. SCIS.* 4334 (2003); David Paetkau et al., *Variation in Genetic Diversity across the Range of North American Brown Bears*, 12 *CONSERVATION BIOLOGY* 418 (1998).

was not “a current threat” to the species.¹¹⁹ The agency therefore proposed to monitor the population and to translocate bears from the Northern Continental Divide Ecosystem once genetic problems became apparent.¹²⁰

Third, the agency’s core-area strategy institutionalizes an acceptance of a shrinking space with a shrinking population. Wolves currently occupy a small fraction of their historical range, and the designate-a-DPS-and-ignore-everything-outside-a-core approach results in an expanding area in which the former presence of the species can be ignored. This approach also abets a forgetfulness that silently removes the idea that the species might live there once again from discussion.¹²¹ In 1995, Daniel Pauly coined a term for such forgetfulness: “the shifting baseline.”¹²² As Dr. Pauly noted,

[The shifting baseline] syndrome has arisen because each generation . . . accepts as a baseline the stock size and species composition that occurred at the beginning of their careers, and uses this to evaluate changes. When the next generation starts its career, the stocks have further declined, but it is the stocks at that time that serve as a new baseline. The result obviously is a gradual shift of the baseline, [and] a gradual accommodation of the creeping disappearance of resource species.¹²³

The USFWS’s application of “significant” institutionalizes the shifting baseline.

Fourth, the agency’s position embodies a static model of nature. Habitat patches are continually changing at a variety of temporal and

119. *Bear Delisting*, *supra* note 67, at 14,927. The question, however, is whether it is a threat within the “foreseeable future.”

120. In response to comments on the lack of connectivity, the agency noted that “[a]ugmentation [*i.e.*, translocation of bears from the Northern Continental Divide Ecosystem in Montana] may not be necessary if natural immigration occurs before 2020.” *Id.* at 14,897. If there is no immigration by 2020, a sufficient number of bears would be translocated to provide “two effective migrants” each decade; migrants are “effective” if they produce offspring that survive. *Id.* at 14,927.

121. Endangered and Threatened Wildlife and Plants; 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, 15,815 (Apr. 1, 2003) (“Because gray wolf recovery in the eastern United States can be achieved by restoring the species in Minnesota, Wisconsin, and Michigan, we do not intend to undertake wolf recovery programs in other areas of the Midwest.”).

122. Daniel Pauly, *Postscript: Anecdotes and the Shifting Baseline Syndrome of Fisheries*, 10 TRENDS ECOLOGY & EVOLUTION 430 (1995).

123. *Id.*

spatial scales. A wind storm blows down a tree, opening a space that provides opportunities for shade-intolerant plants.¹²⁴ Lightning triggers a fire that creates a complex mosaic of burned and unburned areas.¹²⁵ The persistence of species over time thus is dependent upon colonization of emerging patches of suitable habitat. Circumscribing protected areas based on the present distribution of species thus is unlikely to capture the necessary ecological constituents into the foreseeable future.¹²⁶ A significant number of National Wildlife Refuges, for example, are projected to be submerged by the currently projected sea-level rise attributable to climate change.¹²⁷

Fifth, the circumscription of permissible range resulting from the core-area approach draws boundaries that confine the species: the core area becomes an island of habitat surrounded by a hostile sea. Grizzly bears are confined to Yellowstone National Park, wolves to the north woods of the upper Midwest. As a general rule, as the area of an island decreases, so does its biological diversity. An island, in other words, is not simply a smaller piece of land; it is also less diverse than a similarly sized piece of contiguous, patchy habitat. The limited diversity of islands was recognized when ships' scientists, such as Charles Darwin, collected and catalogued the flora and fauna of Pacific islands. Biologists have come to understand, however, that island biogeography applies equally to islands of habitat surrounded by seas of suburbs. Isolated blocks of old growth forest or prairie grasslands, for example, lose species like uranium sheds neutrons.¹²⁸ As land is increasingly fragmented into islands of habitat, we face an accelerating loss of biodiversity because fragmentation increases the risk from stochastic events.¹²⁹ The red fox,

124. CHRIS MASER, *FOREST PRIMEVAL* 78–97 (OSU Press ed. 2001).

125. STEPHEN F. ARNO & CARL E. FIEDLER, *MIMICKING NATURE'S FIRE* 15–28 (2005).

126. See, e.g., Shahid Naeem et al., *Preserving Nature*, in *THE ENDANGERED SPECIES ACT AT THIRTY: CONSERVING BIODIVERSITY IN HUMAN-DOMINATED LANDSCAPES* 70 (J. Michael Scott et al. eds., 2006); Mary Ruckelshaus et al., *Recovering Species of Conservation Concern—Are Populations Expendable?*, in *THE IMPORTANCE OF SPECIES* 305, 310–11 (Peter Kareiva & Simon A. Levin eds., 2003).

127. Anna Pidgorna, *Ecological Representation, Redundancy, and Resilience of North American Waterfowl in the National Wildlife Refuge System* (May 15, 2007) (unpublished Ph.D. dissertation, University of Idaho) (on file with the author).

128. E.g., Ronald L. Westemeier et al., *Tracking the Long-Term Decline and Recovery of an Isolated Population*, 282 *SCI.* 1695 (1998).

129. Stochastic risks increase as the number of individuals and populations of a species decreases because the fewer the number of individuals and the more restricted their range, the greater the risk of extinction in any given period of time. For example, if the entire population of a species is

for example, is missing from Bryce Canyon National Park because the park was too small to maintain a viable population of foxes.¹³⁰

Finally—and most fundamentally—the agency’s position conflates preventing extinction with recovery and begs the issue of conservation goals. What is it that we want to conserve? Zoo specimens? Evolutionary potential? Ecosystem functions? For example, one result of the minimalist, core-area approach is the loss of the roles that species play in ecosystems. This is particularly important for wolves, salmon,¹³¹ and other keystone¹³² or strongly interacting¹³³ species that play disproportionate roles in shaping ecosystems. The reintroduction of wolves into Yellowstone National Park, for example, has rippled through the Park’s natural systems. Aspen stands, which had declined markedly, have increased because elk now avoid those areas, which provide cover for wolves.¹³⁴ A second—and perhaps more striking for its current invisibility—example of the missing players in an ecosystem is the now-absent interaction between grizzly bears, salmon, and old-growth forests. Salmon carcasses are a major source of primary nutrients, such as nitrogen and carbon.¹³⁵ Up to ninety-percent of a grizzly bear’s diet was salmon even in the upper watersheds of the

located on a single atoll, one catastrophic event (such as a tsunami) might extinguish it. See Shaffer, *supra* note 21.

130. William D. Newmark, *Extinction of Mammal Populations in Western North American National Parks*, 9 CONSERVATION BIOLOGY 512, 517 (1995).

131. Christopher A. Peery et al., *Pacific Salmon: Setting Ecologically Defensible Recovery Goals*, 53 BIOSCI. 622 (2003); Mary F. Willson & Karl C. Halupka, *Anadromous Fish as Keystone Species in Vertebrate Communities*, 9 CONSERVATION BIOLOGY 489 (1995).

132. See generally Robert T. Paine, *Food Web Complexity and Species Diversity*, 100 THE AM. NATURALIST 65 (1966). For example, sea otters are keystone species in the near-shore rocky ecosystem of the Pacific coast. The otter preys upon sea urchins, the primary herbivore in the ecosystem. Removal of otters leads to a population explosion of urchins that turn the kelp forests into “deserts” that support far fewer species. See generally James E. Estes et al., *Sea Otter Predation and Community Organization in the Western Aleutian Islands, Alaska*, 59 ECOLOGY 822 (1978).

133. Michael E. Soule et al., *Strongly Interacting Species: Conservation Policy, Management, and Ethics*, 55 BIOSCI. 168 (2005).

134. William J. Ripple & Robert L. Beschta, *Wolves and the Ecology of Fear: Can Predation Risk Structure Ecosystems?*, 54 BIOSCI. 755 (2004); William J. Ripple et al., *Trophic Cascades among Wolves, Elk, and Aspen on Yellowstone National Park’s Northern Range*, 102 BIOLOGICAL CONSERVATION 227 (2001).

135. See, e.g., C. Jeff Cederholm et al., *Pacific Salmon Carcasses: Essential Contributions of Nutrients and Energy for Aquatic and Terrestrial Ecosystems*, 24 FISHERIES 6 (Oct. 1999); Mary F. Willson & Karl C. Halupka, *Anadromous Fish as Keystone Species in Vertebrate Communities*, 9 CONSERVATION BIOLOGY 489 (1995).

Columbia basin; the salmon-eating bears, doing what bears do in the woods, fertilized the forest with some 400 pounds of nitrogen and phosphorus each year. As a result, salmon accounted for approximately twenty-percent of the metabolism of an average tree.¹³⁶

To ignore these effects subverts the objectives of the ESA. Congress, after all, specified that both at-risk species and the ecosystems upon which these species depend were to be conserved.¹³⁷

CONCLUSIONS

Since the Millennium, the USFWS's implementation of the ESA has been defined by a minimalism that verges on hostility. By operationally defining "significant" to exclude all but a core population, the USFWS not only undercuts the ESA's conservation purposes, but also ignores the reasons for conserving biodiversity. Extirpation of peripheral populations is glossed as recovery. Recovery, however, is more than the prevention of extinction. As the USFWS has noted, "the reestablishment of historical populations is a critical component" of recovery.¹³⁸

136. Dale D. Goble, *Salmon in the Columbia: From Abundance to Extinction*, in NORTHWEST LANDS, NORTHWEST PEOPLES: READINGS IN ENVIRONMENTAL HISTORY 229, 234 (Dale D. Goble & Paul W. Hirt eds., 1999) (reporting preliminary results of a study by Charlie Robbins, a Washington State University biologist).

137. 16 U.S.C. § 1531(b).

138. Endangered and Threatened Wildlife and Plants; Establishment of a Nonessential Experimental Population for Two Fishes (Boulder Darter and Spotfin Chub) in Shoal Creek, Tennessee and Alabama, 69 Fed. Reg. 61,774, 61,776 (Oct. 14, 2004).