

ARTICLE

Rethinking the ESA to Reflect Human Dominion Over Nature

by Katrina Miriam Wyman

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My basic critique of the Endangered Species Act (the ESA)¹ is that it is built on an untenable premise that there is something natural—whether called species, ecosystems, or biodiversity—out there that we can save from humanity’s reach. The Act’s problems ultimately are rooted in a denial of the extent of human domination of nature and a failure to recognize our limited ability to halt and reverse the decline of species, ecosystems, and biodiversity given our pervasive impact on the planet. The ESA’s mixed track record in helping species, the overburdened listing process, the poor targeting of the limited public funding for species recovery, and the debate about how much we are spending on species all reflect the triumph of human interests over the interests of species. The central contemporary challenge in protecting biodiversity is recognizing the vast scale of human impacts and the consequent need to prioritize our protection efforts given limited resources.

Today, policy-oriented scientists and legal academics who acknowledge our impact on the earth are discussing two main approaches for managing biodiversity: the ecosystem services paradigm and the biological hotspots paradigm.² Both of these approaches offer ways of deciding which aspects of nature to protect, given the pervasiveness of human impacts on the earth and the limited funds available to safeguard biodiversity.

The first of these two strategies for protecting biodiversity, the ecosystem services paradigm, characterizes biodiversity as

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1. 16 U.S.C. §§1531-1544, ELR STAT. ESA §§2-18.

2. These two paradigms are distinguished and discussed in Peter Kareiva & Michelle Marvier, *Conservation for the People*, SCI. AM., Oct. 2007, at 50, 56.

an ecosystem service whose value to humans should be recognized. This could be done by assigning biodiversity a value in policymaking and by having governments and private actors buy and sell rights to biodiversity protection through instruments such as conservation easements and ongoing payments for conservation.³ In 2005, EPA took a step toward better incorporating the value of ecosystem services such as biodiversity into policymaking. It created a Science Advisory Board panel to examine how the agency can improve its valuation of ecosystem services in cost-benefit analyses.⁴ Some efforts also already have been made in the U.S. to pay for biodiversity protection.⁵ I am skeptical that recognizing biodiversity as a valuable service, pricing it in policymaking, and buying and selling it through government subsidies and private payments will be enough to deal with the large-scale challenge that human dominion of the earth represents for

3. Proponents of protecting biodiversity by recognizing it as an ecosystem service include Peter Kareiva et al., *Domesticated Nature: Shaping Landscapes and Ecosystems for Human Welfare*, 316 SCIENCE 1866 (2007); Kareiva & Marvier, *supra* note 2. In addition to biodiversity, some of the most commonly discussed ecosystem services include air and water purification, flood mitigation, soil fertility, and pollination. For definitions and lists of ecosystem services, see, e.g., J.B. RUHL ET AL., THE LAW AND POLICY OF ECOSYSTEM SERVICES 6-7, 23-26 (2007); James Salzman, *Creating Markets for Ecosystem Services: Notes From the Field*, 80 N.Y.U. L. REV. 870, 872 (2005).

4. On the panel, see U.S. Environmental Protection Agency, Science Advisory Board, Committee on Valuing the Protection of Ecological Systems and Services (2008), <http://yosemite.epa.gov/sab/sabpeople.nsf/WebCommittees/BOARD> (last visited Sept. 16, 2008); see also Salzman, *supra* note 3, at 907 n.164 (speculating that EPA created the Committee “to help the agency counter demands from the Office of Management and Budget that it justify its regulations through cost-benefit analysis”).

Stanford Law School professor Buzz Thompson chairs the panel. U.S. Env’tl. Prot. Agency, Science Advisory Board, Committee on Valuing the Protection of Ecological Systems and Services, Biosketches (2008), [http://yosemite.epa.gov/sab/SABPEOPLE.NSF/WebPeople/Thompson,%20Jr.Barton%20H.%20\(Buzz\)?OpenDocument](http://yosemite.epa.gov/sab/SABPEOPLE.NSF/WebPeople/Thompson,%20Jr.Barton%20H.%20(Buzz)?OpenDocument) (last visited Sept. 16, 2008).

5. For example, the Conservation Reserve Program (CRP) has been made somewhat environmentally sensitive. See, e.g., DEFENDERS OF WILDLIFE, INCENTIVES FOR BIODIVERSITY CONSERVATION: AN ECOLOGICAL AND ECONOMIC ASSESSMENT 57 (2006) (“The Conservation Reserve Program is the largest federal resource conservation program in terms of the number of participants and program expenditures.”); RUHL ET AL., *supra* note 3, at 192 (“Over its twenty year history, in rural America, the CRP has emerged as the primary vehicle for providing a range of ecosystem services related to surface water and groundwater quality, wildlife habitat, recreation, carbon sequestration, and flood mitigation, among others.”); Salzman, *supra* note 3, at 892 (describing “the Conservation Reserve Program” as “one of the largest ecosystem service payment schemes in the world”).

species. To be sure, I agree that we should be doing more to value the benefits of protecting species and to take into account these benefits in making policy decisions that affect biodiversity. We also should aim to pay landowners more often when they can help protect species either through taxpayer-funded conservation payments or private transactions funded by environmental non-governmental organizations (ENGOS) and other actors. But simply approaching biodiversity as an ecosystem service, and valuing as well as buying and selling it, will not deal with the fact that protecting biodiversity in the early twenty-first century requires making choices among species given the pervasive threats they face due to human activities.⁶ Valuing biodiversity and paying for it are tools for protecting the species we have chosen to protect, not ways of making now necessary choices about which species we want to protect. While valuable, the new emphasis on ecosystem services is not sufficient to address our current challenges.

The second strategy that some scientists and others have recommended for protecting biodiversity in the late twentieth and early twenty-first centuries squarely addresses the need to prioritize the protection of some biodiversity if we are to meaningfully protect much of it. This “biological hotspot” strategy starts by assuming that we need to identify priorities for species conservation because “[t]he number of species threatened with extinction far outstrips available conservation resources, and the situation looks set to become rapidly worse.”⁷ In one of the early articles advocating prioritizing conservation in biological hotspots, Myers et al. identified 25 hotspots around the world “featuring exceptional concentrations of endemic species and experiencing exceptional loss of habitat.”⁸ In total these hotspots contained “44% of all plant species world-wide” and 35% of vertebrates.⁹ Myers et al. emphasized that protecting these 25 hotspots, which represent a mere “1.4% of the Earth’s land surface,”¹⁰ would be a cost-effective way of protecting a lot of biodiversity. Subsequently, NGOs such as Conservation International adopted the hotspot strategy to prioritize their conservation work.¹¹

From a global perspective, the U.S. is not a major hotspot overall. Under the Myers et al. definition of a hotspot, the U.S. has only two hotspots: the California Floristic Province and Polynesia/Micronesia (which includes parts of Hawaii).

6. It is important to recognize the practical difficulties of monetizing many of the benefits that we derive from the continued existence of species. See, e.g., FRANK ACKERMAN & LISA HEINZERLING, PRICELESS: ON KNOWING THE PRICE OF EVERYTHING AND THE VALUE OF NOTHING 153-78 (2004) (emphasizing the limits of contingent valuation of nature); Lisa Heinzerling, *Why Care About the Polar Bear? Economic Analysis of Natural Resources Law and Policy*, in THE EVOLUTION OF NATURAL RESOURCE LAW AND POLICY 15, 15-26 (forthcoming 2008), available at <http://ssrn.com/AbstractID=1026288>. Also, there are many obstacles to establishing markets and payment programs for ecosystem services such as biodiversity protection, including delineating the services to be protected and assigning property rights that could be traded. See, e.g., Salzman, *supra* note 3.

7. Norman Myers et al., *Biodiversity Hotspots for Conservation Priorities*, 403 NATURE 853, 853 (2000).

8. *Id.*

9. *Id.* at 855.

10. *Id.*

11. See CONSERVATION INTERNATIONAL, ANNUAL REPORT 2006 (2006), available at http://www.conservation.org/Documents/pub_annualReport_06.pdf.

Subsequent analyses using different criteria for defining a hotspot have suggested that there are four biological hotspots in the United States (Hawaii, southern California, southeastern coastal areas in Florida and Georgia, and southern Appalachia)¹² or perhaps twelve.¹³ The pattern of listings of endangered and threatened species in the U.S. also indicates that imperiled species are heavily concentrated in a small number of areas in the country. Almost 50 percent of listed species living in the U.S. occur in Hawaii (25 percent of listed species in U.S.) and California (23 percent).¹⁴ “[S]ome 72 percent [of listed species] occur in just six states: California, Hawaii, Florida, Alabama, Tennessee, and Texas.”¹⁵ Under the hotspot approach, the geographic concentration of imperiled biodiversity would influence where resources are allocated.

The hotspot approach obviously has pitfalls. While it may maximize the overall number of species that are protected, it will not protect some species that humans care deeply about, and as a result it may reduce public support for biodiversity protection. Taken to an extreme, the hotspot approach could lead us to focus on protecting biodiversity in only four to six U.S. states, and to ignore the fact that significant numbers of species are imperiled in many other states.¹⁶ But the hotspot approach does have the advantage of helping to identify priorities for conservation policy, something that is necessary in an era of pervasive threats to biodiversity. Below I suggest how we might reform the ESA and other policy frameworks to enable us to better target biodiversity protection without rigidly limiting ourselves to protecting species only if they are located in hotspots.

I. Continue to List Species but Decouple Listing and Permanent Protections

I recommend that we continue to list imperiled species much as we do now under the ESA based on the threats that they face and in response to petitions from outside persons as well as internal U.S. Fish & Wildlife Service (FWS) recommendations.¹⁷ To be sure, there are problems with the existing

12. See, e.g., A.P. Dobson et al., *Geographic Distribution of Endangered Species in the United States*, 275 SCIENCE 550, 551 (1997); Jon Paul Rodriguez et al., *Where are Endangered Species Found in the United States?*, 14 ENDANGERED SPECIES UPDATE 1 (2007), available at <http://www.umich.edu/~esupdate/library/97.03-04/rodriguez.html>.

13. Curtis H. Flather et al., *Threatened and Endangered Species Geography*, 48 BIOSCIENCE 365, 367 (1998).

14. U.S. Fish and Wildlife Service, USFWS Threatened and Endangered Species System, How many species are listed in each state (based on published population data)?—08/26/2008, http://ecos.fws.gov/tess_public/StateListing.do?state=all (last visited Sept. 16, 2008).

15. J. Michael Scott et al., *By the Numbers*, in 1 THE ENDANGERED SPECIES ACT AT THIRTY: RENEWING THE CONSERVATION PROMISE 16, 20 (Dale D. Goble et al. eds., 2006).

16. According to NatureServe, “in one out of every four states, more than ten percent of native species are at risk.” NATURESERVE, STATES OF THE UNION: RANKING AMERICA’S BIODIVERSITY 2 (2002), available at <http://www.natureserve.org/Reports/stateofunions.pdf> (data indicate that four states have “exceptional levels of biodiversity” and that “in one out of every four states, more than ten percent of native species are at risk”).

17. Currently, the ESA requires the Secretaries of the Interior and Commerce to maintain lists of endangered and threatened species. 16 U.S.C. §1533(a)-(c). Housed in the Commerce Department, the National Marine Fisheries Service

threat-based criteria in the Act,¹⁸ and the statutory definitions of species,¹⁹ endangered,²⁰ and threatened²¹ that the FWS applies in making listing determinations. For example, the Act provides no clear guidance about when a species is endangered or threatened.²² Nonetheless, the existing statutory parameters for listing are worth retaining because we have over thirty years of administrative and judicial experience applying them, and it is unclear that we could come up with better parameters now.

Under the current statute, once a decision is made to list a species, a series of protections automatically kick in on behalf of that species.²³ While we should still list species as we do now, I recommend decoupling the decision to list a species from decisions about how to protect the species. This decoupling would allow us to develop protections tailored to the needs of each species and its circumstances.

To elaborate, listing should no longer trigger the seemingly permanent one-size-fits-all consequences that it does now in the form of the §7 no-jeopardy provision, the §9 prohibition on takings, and the requirements to designate critical habitat

and prepare a recovery plan. Instead, once a species is listed, it should benefit from a series of protections for a temporary period of time until the FWS identifies the measures that would most cost-effectively protect the species.²⁴ Like a preliminary injunction, these temporary protections would safeguard the status quo for a species and possibly begin to put it on the path toward recovery, depending on how extensive those protections were. For administrative simplicity, all species would receive the same temporary protections pending the completion of the FWS' review of the measures needed to cost-effectively protect the species. The scope of these protections could be the subject of negotiations among interests groups in the reauthorization of the ESA. Potentially, the protections could include modified versions of the safeguards that currently kick in automatically upon listing, such as §§7 and 9.

My hope is that requiring the FWS to identify the most cost-effective ways of protecting a species in the long-term, while the species is temporarily safeguarded, could allow the FWS to develop protections that are tailored to each species' needs and circumstances. Tailored protection might in turn improve the odds of species recovery. In addition, the approach I recommend might reduce the contentiousness of the listing decision because listing would no longer trigger a series of seemingly permanent one-size-fits-all protections.²⁵ Reducing the consequences of listing might reduce the incentive to litigate the FWS' listing determinations. With less litigation, the FWS might be able to evaluate many more species for listing. It is possible, though, that requiring the FWS to design cost-effective protections for each species after listing also could open up a new burdensome front for litigation. For example, in addition to, or instead of, litigating listing determinations, groups could challenge the timeliness and adequacy of the FWS' cost-effectiveness analyses.

II. Identify and Implement the Most Cost-Effective Protections for Species

Under my proposal, as discussed above, the listing of a species would trigger a legal obligation on the FWS to determine the measures that would most cost-effectively protect the species, and then to promulgate any regulations necessary to implement these cost-effective protections. The FWS would be required to identify these cost-effective protections within a legislated timeframe that could be used to force the agency to act. While the FWS undertook its review, the interim measures mentioned above would remain in place to avoid a situation where a species was listed but people were free to reduce its population and its habitat to forestall further protections.

I elaborate on four aspects of this proposed obligation on the FWS to identify cost-effective protections. The first is the purpose of the exercise: identifying measures to protect the

(NMFS), also called the National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries), is responsible for marine and anadromous fisheries under the Act. NMFS is responsible for only 67 species, a much smaller number of species than the FWS. As a result I refer throughout to FWS and the Secretary of the Interior as responsible for the ESA. NOAA Fisheries, Office of Protected Resources, Endangered Species Act, <http://www.nmfs.noaa.gov/pr/laws/esa/> (last visited Sept. 16, 2008); see also Paul R. Armsworth et al., *Marine Species*, in 1 THE ENDANGERED SPECIES ACT AT THIRTY, *supra* note 15, at 36.

18. Section 4(a) indicates that a population should be listed if it is "an endangered species or a threatened species because of any of the following factors: (A) the present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence." *Id.* §1533(b) (2000). Section 1533(b) allows the FWS to not list a population regardless of the threats that it faces if the FWS determines that another domestic or foreign jurisdiction is doing enough to help the population. See also Policy for Evaluation of Conservation Efforts When Making Listing Decisions, 68 Fed. Reg. 15, 100 (Mar. 28, 2003).
19. Under the ESA, *species* "includes any subspecies of fish or wildlife or plants, and any distinct population segment of any species or vertebrate fish or wildlife which interbreeds when mature." 16 U.S.C. §1532(16).
20. An *endangered* species is defined as "any species which is in danger of extinction throughout all or a significant portion of its range." 16 U.S.C. §1532(6).
21. A *threatened* species is "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." 16 U.S.C. §1532(20).
22. Holly Doremus, *Science Plays Defense: Natural Resource Management in the Bush Administration*, 32 *ECOLOGY L.Q.* 249, 267-74 (2005); William Burnham et al., *Hands-On Restoration*, in 1 THE ENDANGERED SPECIES ACT AT THIRTY, *supra* note 15, at 237, 244 (recommending that the ESA be amended to include "objective definitions for 'threatened' and 'endangered' that incorporate specific criteria" and criticizing "threatened" especially as "too vague as presently defined"); Scott et al., *supra* note 15, at 21 (noting that ESA "lacks explicit criteria for determining population thresholds (individuals and populations), risk of extinction, and demographic trends").
23. First, the U.S. Fish & Wildlife Service (the FWS or the Service) must designate critical habitat for the species upon listing. 16 U.S.C. §1533(a)(3)(A). Second, §7(a)(2) requires that federal agencies consult with the FWS to "insure that any action authorized, funded, or carried out . . . is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of" the critical habitat of a listed species. *Id.* §1536(a)(2). Third, §9(a)(1)(B) prohibits public and private actors from taking endangered fish and wildlife, including taking the species' habitat. *Id.* §1538(a)(1)(B). Section 1533(d) allows the FWS to establish prohibitions on taking threatened species. *Id.* §1533(d). Fourth, and more proactively, the ESA requires the FWS to develop and implement recovery plans to protect endangered and threatened species. *Id.* §1533(f).

24. See *infra* Part B.

25. On the contentiousness of the listings under the current Act, please refer to my original article, Katrina Miriam Wyman, *Rethinking the ESA to Reflect Human Dominion Over Nature*, 17 N.Y.U. ENVTL. L.J. 490, 496-98 (2008).

listed species. The ESA currently sets a high but vague goal in relation to listed species, namely recovering their populations to allow them to live without the Act's protections.²⁶ But in practice few listed species have been delisted, and the most frequent beneficial consequence of listing a species has been stabilizing or slightly increasing its population.²⁷ Our experience under the Act and the pervasive threats to species today raise a fundamental question about whether we still should be aiming to recover listed species or whether it would be preferable to set a more realistic and precise, but less inspiring, objective. This could be something like making it unlikely that the species would become extinct over three human generations,²⁸ or reducing the risk of extinction to a certain percentage over a 100-year time period.²⁹ While I do not have a view about what the objective should be, it likely would be necessary to define a more precise goal for listed species than is included in the current Act to implement a cost-effectiveness test. To identify the most cost-effective ways of protecting a species, the FWS likely would need a more straightforward sense of what it aims to do in protecting the species.

A second issue is what type of measures the FWS should consider in trying to identify the most cost-effective ways of protecting a listed species. One of the advantages of decoupling the listing of a species from decisions about how it should be protected is that there would be greater room for developing creative measures tailored to species' needs and circumstances. In this spirit, the FWS should consider a wide range of measures in ascertaining which would most cost-effectively protect the species. These could include "the old standbys" such as designating critical habitat, prohibiting taking species as under §9, and imposing special obligations on federal agencies as under the current §7. In addition, other more flexible and market-based measures used over the past several decades to protect species should be canvassed. These include buying land, conservation payments to state and local governments and private landowners, conservation easements,³⁰ conservation banking,³¹ recovery credit

systems,³² recovery and habitat conservation plans, and fees for converting the habitat of endangered species.³³ Furthermore, it would be natural to analyze measures commonly part of today's recovery plans since the FWS' effort to identify the most cost-effective ways of protecting a species would supplant the current recovery planning process.

A third point worth clarifying is the meaning of the cost-effectiveness standard that the FWS would apply in identifying the measures that should be undertaken on behalf of the listed species. The point of requiring the cost-effectiveness analysis is to structure the decisionmaking process, not to limit the FWS to choosing only the package of protections that it predicts will be the cheapest way of protecting a species measured in dollar terms. I am suggesting that in determining which measures should be implemented, the FWS should choose those that will most cheaply protect the species, whether protection is defined as it is under the current Act as recovering the species to the point that it can be delisted or as something else.³⁴ However, the FWS should take a broad view of what counts as a cost in determining the costs of the various possible measures, and in selecting those measures that will protect the species at least cost. A measure's costs should include those that are easily monetizable, such as the cost of buying land if land acquisition is under consideration. In addition, harder to monetize costs such as a measure's ethical, political, and distributional costs should be analyzed. The co-costs of protective measures also should be counted. For example, if a protective measure would harm other species or reduce the availability of valuable ecosystem services, such as water purification, then these harms should be included among the measure's costs. A more structured decisionmaking process should make the trade-offs inherent in species recovery more transparent and allow policymakers to be held accountable for these trade-offs.

Fourth, the FWS should follow a procedure that makes its proposed package of cost-effective protective measures available for public comment before the package is finalized. Upon finalizing the package, the FWS should prescribe any regulations required to implement the package, such as regu-

26. The stated purposes of the ESA include providing "a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, [and] to provide a program for the conservation of such endangered species and threatened species." 16 U.S.C. §1531(b). Under the Act, "[t]he terms 'conserve,' 'conserving,' and 'conservation' mean to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary." 16 U.S.C. §1532(3).

27. See Wyman, *supra* note 25, at 494-95.

28. This possible definition of recovery was discussed by participants in the ESA working group organized by the Keystone Center. THE KEYSTONE CENTER, THE KEYSTONE WORKING GROUP ON ENDANGERED SPECIES ACT HABITAT ISSUES: FINAL REPORT 31 (2006) [hereinafter KEYSTONE CENTER].

29. This is another possible definition of recovery that the Keystone Group discussed. *Id.* at 38.

30. See, e.g., Matt Weiser, *Guardians of the Range: A Conservation Group That Aims to Protect 13 Million Acres Is Doing the Unthinkable: Getting Ranchers and Environmentalists to Work Together*, SACRAMENTO BEE, May 8, 2007, at A1 (discussing efforts of ranchers and environmentalists to protect range land from development, for example through sale and purchase of development rights).

31. See Guidance for the Establishment, Use, and Operation of Conservation Banks, 68 Fed. Reg. 24753 (May 8, 2003). For a balanced account of the potential benefits and risks of conservation banking and a description of its current use to protect species, see Jessica Fox et al., *Conservation Banking*, in

2 THE ENDANGERED SPECIES ACT AT THIRTY: CONSERVING BIODIVERSITY IN HUMAN-DOMINATED LANDSCAPES 49, 228 (J. Michael Scott et al. eds., 2006).

32. See Endangered and Threatened Wildlife and Plants; Notice of Availability for Draft Recovery Crediting Guidance, 72 Fed. Reg. 62258 (Nov. 2, 2007) (proposing recovery crediting system analogous to conservation banking that would allow federal agencies to meet conservation objectives on non-federal lands and identifying program at Fort Hood Military Reservation as the model for the proposal).

33. See, e.g., Thomas A. Scott et al., *Land Use Planning*, in 2 THE ENDANGERED SPECIES ACT AT THIRTY, *supra* note 31, at 206, 213 (referring to a fee developers paid for each housing unit under the Stephens' Kangaroo Rat HCP); *id.* at 214 (describing mitigation fee developers pay to offset interference with endangered species habitat under Western Riverside County Multi-Species HCP); Barton H. Thompson Jr., *Managing the Working Landscape*, in 1 THE ENDANGERED SPECIES ACT AT THIRTY, *supra* note 15, at 108 (referring to impact fee in expedited Balcones Canyonlands program); *id.* at 109 (referring to fee for destroying habitat of Houston toad in Texas); *id.* at 116 ("Under the typical regional HCP, developers wishing to build new residential, commercial, or industrial properties pay a fee that is used to help acquire, restore, and manage habitat for the protected species.")

34. In some respects, my proposal echoes the idea discussed by the Keystone Working Group of getting recovery teams to analyze the least-cost ways of recovering species. KEYSTONE CENTER, *supra* note 28, at 32.

lations designating critical habitat, or prohibitions on taking the species, or obligations that federal agencies consult with the FWS. The FWS also should be required to periodically review and update its determinations of the measures necessary to protect species.

The idea of using a cost-effectiveness test to design protective measures for species on an individual basis builds on several existing features of the ESA. For example, the Act currently recognizes in several places that species require individually tailored protections. One example is the requirement that the FWS prepare a recovery plan after a species is listed. A second instance is the discretion that the Act grants the FWS to craft finely grained prohibitions on taking threatened species in particular.³⁵ There is also precedent in the current Act for considering the costs of protections before extending these protections to listed species. Before designating critical habitat for endangered and threatened species, the FWS is required to take into consideration “the economic impact, the impact on national security, and any other relevant impact, of specifying any particular area as critical habitat.”³⁶ As a result of this requirement, the FWS has considerable experience assessing the economic impacts of designating critical habitat, although the FWS’ methodology for assessing these impacts is by no means beyond criticism. For instance, its economic impact analyses offer much more precise valuations of the costs than the benefits of designating critical habitat.³⁷

Under my proposal, the FWS would not be weighing the costs and the benefits of a possible protective measure before deciding whether to implement it. Instead, the agency would be choosing among possible protective measures based on their relative costs. Since the FWS would only be required to count the costs of different measures, the gaps in properly valuing benefits would not matter.

I emphasize that I am not seeking to weaken the protection available to species by stipulating that measures to safeguard them should be designed on a case-by-case basis after they are listed. On the contrary, my goal is to craft stronger, more efficient protections for listed species than many currently enjoy. Protecting biodiversity should not be an all or nothing decision contingent on listing species as it generally is now.

III. Direct Funding to Biological Hotspots

There is no guarantee that protecting each species cost effectively will produce the most conservation for the buck overall. We might simply end up protecting many species in the cheapest way possible on a per-species, or retail, basis. But in the aggregate it might be more cost-effective to protect a

smaller number of indicator or umbrella species in the cheapest way possible. Protecting these species in turn might safeguard many others from extinction without requiring us to specifically target the other species. This is the basic intuition behind the biological hotspot strategy, which in effect seeks to cost-effectively protect as many species as possible on a wholesale level.³⁸

Ultimately, properly targeting funding for conservation policy to protect the most species possible at the least cost requires rethinking the way we allocate public and private funding for species conservation. This is not something that can be done by reforming the ESA. Public and private actors decide how much to spend on species conservation and how this spending should be distributed among species in response to the political, bureaucratic, and other incentives that they face, not based on the requirements of the ESA.³⁹ These funding decisions, however, have major implications for the ESA. How much is spent on species conservation and how it is spent frustrate or facilitate efforts to protect species.

The current allocation stems from well-entrenched features of the political system. One idea might be to add new reporting requirements into the ESA in an effort to shift popular, political, and bureaucratic opinion toward funding protection for hotspots. Currently, the Act requires the FWS to make various reports to Congress.⁴⁰ We should add reporting requirements that would force the FWS to determine how the U.S. is doing in protecting its biological hotspots and how current resource allocations compare to those that would protect these hotspots. For example, the FWS might be statutorily required to report every few years on how well the United States is doing in protecting its biological hotspots. In addition, the FWS might be required to report every two years on how funding for its Endangered Species Program, as well as total federal and state funding on imperiled species, would be distributed if we were protecting biological hotspots in the United States, and how much the current allocation of funds departs from this theoretical ideal.⁴¹ The FWS also could report periodically on how much the allocation of funding for the Endangered Species Program and the allocation of total federal and state spending among species depart from the allocation suggested by the agency’s priority ranking system for species.⁴²

Reports such as these would not by themselves trigger wholesale changes in the allocation of funding among species. But these reports might be used by policy entrepreneurs in land trusts, NGOs, academia, Congress, and state legislatures, as well as federal and state agencies, to gradually reconfigure funding to achieve more conservation.

35. 16 U.S.C. §1533(d).

36. 16 U.S.C. §1533(b)(2).

37. See, e.g., Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Blackburn’s Sphinx Moth, 68 Fed. Reg. 34710, 34727 (June 10, 2003) (“It is not feasible . . . to fully describe and quantify . . . benefits in the specific context of the proposed critical habitat for Blackburn’s sphinx moth because of the scarcity of available studies and information relating to the size and value of beneficial changes . . . likely to occur as a result of listing the moth or designating critical habitat.”).

38. Conservation International, *The Hotspots* (2008), http://www.conservation.org/explore/priority_areas/pages/hotspots.aspx (last visited Sept. 14, 2008).

39. See Wyman, *supra* note 25, at 499-502.

40. See, e.g., 16 U.S.C. §1544.

41. There already is some research assessing whether federal and state spending on species is in effect targeting hotspots. See, e.g., Flather et al., *supra* note 13, at 374 (suggesting that currently species-specific spending is not targeting hotspots).

42. See Wyman, *supra* note 25, at 500-01.

IV. Create Additional Protected Areas

The ESA is only one of the tools at our disposal to protect biodiversity, and perhaps not even the most important one. As just discussed, funding decisions made separately from the ESA have an equal and probably more significant impact on species preservation. Similarly, decisions about which lands and marine areas to protect made under statutes like the Antiquities Act, the Wilderness Act, and the Wild and Scenic Rivers Act also have a great deal of influence on whether we are able to successfully protect biodiversity. While we should rethink the ESA so that we can better address the pervasive threats to species today, we should not expect the ESA to bear the full weight of protecting biodiversity. The Act, after all, essentially offers emergency safeguards for species that are on, or close to, the brink of extinction.⁴³ It would be better to take preventative actions to avoid bringing species to this point by acting under the myriad of other legislative and policy frameworks that allow us to prophylactically protect biodiversity.

The distribution of imperiled species in the United States indicates that we will never be able to rely completely on protected areas to safeguard species.⁴⁴ However, there is a powerful argument that one of the best ways of protecting biodiversity is through protected areas because these areas can be managed to privilege biodiversity protection.⁴⁵

At the dawn of the twenty-first century, the time is ripe for expanding our protected areas to respond to the preservation needs of our own time. In light of our over-exploitation of marine resources in the 20th century, we need to establish protected areas in the U.S. Exclusive Economic Zone before these waters are stripped further of biodiversity.⁴⁶ We also

need to increase the diversity of our protected areas on land. In addition, we should be analyzing the likely impacts of climate change on our protected areas, and whether we need to establish new protected areas in light of the expected impacts of climate change on humans and other species. There also is a powerful argument for transferring some acreage currently held in the public domain to private actors, especially if this acreage is being actively exploited, as we expand the number of protected areas overall.

A congressionally chartered commission should be established to review the U.S.'s current approach to protected areas on land and water, map out the needs for protected areas going forward, and determine how these needs should be met. The tremendous growth in the past two decades in the acreage held under conservation easements⁴⁷ indicates that there is significant scope for land trusts, private actors, and NGOs as well as governments to participate in expanding our network of protected areas to better protect biodiversity. However, we might want to steer private and non-profit actors more than we have to date towards protecting acreage in certain parts of the country or certain types of land- and sea-scapes.⁴⁸ This could be done by offering extra tax advantages for easements that would protect biodiversity in hotspots.

V. Conclusion

For the past decade or so, many of the ESA's supporters and critics have been bogged down in a series of small "p" policy debates about issues such as whether critical habitat should be designated and if so when, whether landowners should be compensated for measures they are required to take to protect species, and the merits of flexible instruments such as habitat conservation plans introduced in the 1990s. It is time to set aside these debates and to address the underlying cause of the ESA's ills: the pervasiveness of human-induced threats to species that are behind the warnings from many ecologists that "[w]e are at the beginning of the sixth great extinction event."⁴⁹ The pervasiveness of these threats means that we need to prioritize our conservation efforts. It also requires us to think beyond the ESA. A reformed ESA cannot be the only mechanism through which we attempt to protect biodiversity in the world we now dominate.

43. Bradley C. Karkkainen, *Biodiversity and Land*, 83 CORNELL L. REV. 1, 20 (1997).

44. Mark L. Shaffer et al., *Proactive Habitat Conservation*, in 1 THE ENDANGERED SPECIES ACT AT THIRTY, *supra* note 15, at 286, 291. *See also* Jonathan H. Adler, *Money or Nothing: The Adverse Environmental Consequences of Uncompensated Land-Use Controls*, 49 B.C. L. REV. 301, 302 (2008) ("A significant majority of those species currently listed as threatened or endangered under the Endangered Species Act rely upon private land for some or all of their habitat.") (citing various sources on the importance of private lands for listed species); Frank W. Davis et al., *Renewing the Conservation Commitment*, in 1 THE ENDANGERED SPECIES ACT AT THIRTY, *supra* note 15, at 304 ("50 percent of listed species [have] . . . 80 percent or more of their known occurrences on private lands."); J.M. Scott et al., *Nature Reserves: Do They Capture the Full Range of America's Biological Diversity?*, 11 ECOLOGICAL APPLICATIONS 999, 999 (2001) ("Preliminary assessments of the distribution of threatened and endangered species suggest that >90% of such species occur on private lands, with 66% having >60% of their area on private lands.")

45. Professor Karkkainen makes a powerful case for establishing biological reserves on federally owned public lands. Karkkainen, *supra* note 43.

46. STEPHEN PALUMBI, PEW OCEANS COMMISSION, MARINE RESERVES: A TOOL FOR ECOSYSTEM MANAGEMENT AND CONSERVATION (2002), available at http://www.pewtrusts.org/uploadedFiles/wwwpewtrustsorg/Reports/Protecting_ocean_life/pew_oceans_marine_reserves.pdf. The U.S. is already taking some steps toward protecting marine life. President Bush recently established a marine reserve that is the largest nature reserve in the world. *See* Felicity Barringer, *Support for Marine Reserves*, N.Y. TIMES, Aug. 26, 2008, at A13; Christopher Pala, *A Long Struggle to Preserve a Hawaiian Archipelago and Its Varied Wildlife*, N.Y. TIMES, Dec. 19, 2006, at F3.

47. *See, e.g.*, James R. Rasband & Megan E. Garrett, *A New Era in Public Land Policy? The Shift Toward Reacquisition of Land and Natural Resources*, 53 ROCKY MTN. MIN. L. INST. 6, 33 (2007); John Echeverria & Jeff Pedot, *Drawing the Line: Striking a Principled Balance Between Regulating and Paying to Protect the Land 2-3* (Georgetown Environmental Law & Policy Institute, Discussion Draft, 2008).

48. There is little public oversight or coordination of where conservation easements are placed. Echeverria & Pedot, *supra* note 47, at 7-9.

49. MICHAEL NOVACEK, TERRA: OUR 100-MILLION-YEAR-OLD ECOSYSTEM—AND THE THREATS THAT NOW PUT IT AT RISK xiv, 340 (2007).