

KEEPING THE ENDANGERED SPECIES ACT RELEVANT

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ABSTRACT

The Endangered Species Act (ESA) has long been the workhorse of species protection in contexts for which a species-specific approach can effectively be employed to address discrete human-induced threats that have straightforward causal connections to the decline of a species, such as clearing of occupied habitat for development or damming of a river. Its resounding success there, however, has led to the misperception that it can duplicate that record anywhere and for any reason a species is at risk. Yet, is the statute adaptable to the sprawling, sometimes global, phenomena that are wearing down our environmental fabric on landscape scales through complex causal mechanisms? For example, can the ESA effectively be used to combat climate change by regulating greenhouse gas emissions, to combat the impacts of urbanization by mandating green buildings, or to mitigate ecological degradation by demanding that resource users take into account the values of natural capital and ecosystem services? This article suggests that it would be unwise to push the ESA in that direction, but that the ESA nonetheless has a supporting role to play in the development of policies designed to address those problems. In particular, the ESA should be focused toward consolidating its core power to arrest the conversion of intact habitat to urban land uses, and from there it should be used to leverage its habitat protection function to promote policies responding to climate change, urban impacts,

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ecological degradation, and other ecological problems characterized by complex, large-scale, indirect causal mechanisms.

I. INTRODUCTION

At a time when climate change, the impacts of expanding urbanization, and the deterioration of ecological systems threaten to push an ever-growing number of species into dire conditions,¹ it may seem preposterous to suggest, as the title of this article does, that the Endangered Species Act (ESA)² could be in danger of becoming irrelevant. But the question is not whether a policy aimed toward managing the species imperilment problem is relevant—it appears we will need one in the Obama Administration and well into the future³—but rather, whether the ESA in particular is well-positioned

1. See, e.g., Stuart Pimm et al., *Human Impacts on the Rates of Recent, Past, and Future Bird Extinctions*, 103 PROC. NAT'L ACAD. SCI. 10941, 10941 (2006) (stating that, based on historical trends, at least twelve percent of bird species in North America will become extinct in the twenty-first century); Anthony Ricciardi & Joseph B. Rasmussen, *Extinction Rates of North American Freshwater Fauna*, 13 CONSERVATION BIOLOGY 1220, 1220 (1999) (predicting a four percent future extinction rate per year for freshwater fauna, which is five times higher than for terrestrial fauna).

2. Endangered Species Act of 1973, 16 U.S.C. §§ 1531–44 (2006). This article is not intended to provide a comprehensive overview of the ESA. Rather, it focuses on suggesting broad themes for implementing the statute in the new Administration. For comprehensive treatments of the ESA, several of which are referred to frequently *infra*, see generally MICHAEL J. BEAN & MELANIE J. ROWLAND, *THE EVOLUTION OF NATIONAL WILDLIFE LAW* (3d ed. 1997); ENDANGERED SPECIES ACT: LAW, POLICY, AND PERSPECTIVES (Donald C. Baur & Wm. Robert Irvin eds., 2002) [hereinafter *LAW, POLICY, AND PERSPECTIVES*]; LAWRENCE R. LIEBESMAN & RAFÉ PETERSEN, *ENDANGERED SPECIES DESKBOOK* (2003); STANFORD ENVTL. LAW SOC'Y, *THE ENDANGERED SPECIES ACT* (2001); TONY A. SULLINS, *ESA: ENDANGERED SPECIES ACT* (2001); *THE ENDANGERED SPECIES ACT AT THIRTY: RENEWING THE CONSERVATION PROMISE* (Dale D. Goble et al. eds., 2006) [hereinafter *THE ENDANGERED SPECIES ACT AT THIRTY*].

3. See U.S. Fish & Wildlife Serv., *General Statistics for Endangered Species*, http://ecos.fws.gov/tess_public/TessStatReport (last visited Feb. 17, 2009). There are 612 animal species and 746 plant species with at least part of their range in the United States listed under the ESA as threatened or endangered. *Id.* This number is not expected to fall any time soon, as climate change has been described as “a major threat to the survival of species and integrity of ecosystems world-wide.” Philip E. Hulme, *Adapting to Climate Change: Is There Scope for Ecological Management in the Face of a Global Threat?*, 42 J. APPLIED ECOLOGY 784, 784 (2005). In its 2007 *Synthesis Report*, the Intergovernmental Panel on Climate Change predicts that “[t]here is *medium confidence* that approximately 20 to 30% of species assessed so far are *likely* to be at increased risk of extinction if increases in global average warming exceed 1.5 to 2.5°C (relative to 1980–1999),” and that if warming “exceeds about 3.5°C, model projections suggest significant extinctions (40 to 70% species assessed) around the globe.” INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *CLIMATE CHANGE 2007: SYNTHESIS*

to address the collection of social, economic, and environmental problems that seem most likely to present problems for species in the foreseeable future. The ESA has long been the workhorse of species protection in contexts for which a species-specific approach can effectively be employed to address discrete human-induced threats that have straightforward causal connections to the decline of a species, such as clearing of occupied habitat for development or damming of a river.⁴ Yet, is the statute adaptable to the sprawling, sometimes global, phenomena that are wearing down our environmental fabric on landscape scales through complex causal mechanisms? Many seem to hope so,⁵ but I have my doubts about whether trying to move in this direction makes the best use of the ESA in the long run.

Consider, for example, three policy trends that have taken center stage as offering traction on the problem set just described: (1) greenhouse gas emission regulation to respond to climate change,⁶ (2) the promotion of green building design to respond to the impacts of urban development,⁷ and (3) the integration of ecosystem service and

REPORT 13–14 (2007), available at http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf.

4. See Barton H. Thompson, Jr., *Managing the Working Landscape*, in THE ENDANGERED SPECIES ACT AT THIRTY, *supra* note 2, at 101, 104 (“[ESA enforcement] has had the greatest impact on active changes in species habitat (e.g., the construction of new subdivisions, timber harvesting, and water diversions) . . .”).

5. See, e.g., ROBERT MELTZ, CONG. RESEARCH SERV., USE OF THE POLAR BEAR LISTING TO FORCE REDUCTION OF GREENHOUSE GAS EMISSIONS: THE LEGAL ARGUMENTS 5–6 (2008), available at <http://ncseonline.org/nle/crsreports/08-Sept/RS22906.pdf> (discussing the Center for Biological Diversity’s campaign to address climate change issues through the Endangered Species Act); Brenden R. Cummings & Kassie R. Siegel, *Ursus maritimus: Polar Bears on Thin Ice*, 22 NAT. RESOURCES & ENV’T 3, 3 (2007) (explaining their vision of the legal consequences of their petition for polar bear listing).

6. See, e.g., *Massachusetts v. EPA*, 127 S. Ct. 1438 (2007) (requiring the Environmental Protection Agency to determine the efficacy of greenhouse gas emission regulation under the Clean Air Act). For summaries of proposed and adopted federal, state, and local climate change measures, which is a fast-moving area of developments, see J.R. DeShazo & Jody Freeman, *Timing and Form of Federal Regulation: The Case of Climate Change*, 155 U. PA. L. REV. 1499, 1521–30 (2007); David R. Hodas, *State Initiatives*, in GLOBAL CLIMATE CHANGE & U.S. LAW 343, 343–69 (Michael B. Gerrard ed., 2007); Stephen C. Jones & Paul R. McIntyre, *Filling the Vacuum: State and Regional Climate Change Initiatives*, 38 ENV’T REP. (BNA) 1640 *passim* (2007); PEW CENTER ON GLOBAL CLIMATE CHANGE, A LOOK AT EMISSIONS TARGETS, http://www.pewclimate.org/what_s_being_done/targets (last visited Feb. 17, 2009).

7. I use the term “green building” to refer to the practice of designing, constructing, and operating buildings with greater attention to energy efficiency, water use efficiency, waste reduction, toxics reduction, and use of recycled and other resource-efficient construction materials. See U.S. EPA, Green Building, <http://www.epa.gov/greenbuilding> (last visited Mar. 7, 2009). The foremost compilation of green building techniques has come through the industry-

natural capital values into environmental decision-making to respond to unsustainable ecological resource uses.⁸ Because the problems that have motivated these policy trends present clear and substantial threats to species,⁹ one might reasonably assume that the ESA could be aggressively employed to put these policies into motion. But that is not nearly as firm a case as it may seem. This article explores why, and offers an alternative strategy for the Obama Administration's ESA implementation.

Part II of the article identifies the practical limits the ESA faces when its impressive regulatory power¹⁰ is aimed at problems like

led Leadership Energy and Environmental Design (LEED) Green Building Rating System. See U.S. Green Bldg. Council, LEED, <http://www.usgbc.org/leed>. The LEED initiative has produced a series of rating systems for awarding "points" to buildings based on defined attributes, such as building materials, siting, and energy efficient building techniques. See, e.g., U.S. GREEN BUILDING COUNCIL, LEED FOR NEW CONSTRUCTION & MAJOR RENOVATIONS (2005), available at www.usgbc.org/ShowFile.aspx?DocumentID=1095 [hereinafter LEED FOR NEW CONSTRUCTION]. There is also a growing movement to adopt green building codes to integrate these techniques into state and local development regulations. See Sara Bronin, *The Quiet Revolution Revived: Sustainable Design, Land Use Regulation, and the States*, 93 MINN. L. REV. 231, 231–34, 240–48 (2008); Carl J. Circo, *Using Mandates and Incentives to Promote Sustainable Construction and Green Building Projects in the Private Sector: A Call for More State Land Use Policy Initiatives*, 112 PENN. ST. L. REV. 731, 732 (2008); LES LO BAUGH, *LEED Green Building Incentives*, in GREEN REAL ESTATE SUMMIT 2008: WHAT ATTORNEYS, DEVELOPERS, BANKERS AND REGULATORS NEED TO KNOW 79 (Practising Law Inst. ed., 2008) (providing a survey of federal, state, and local green building incentives and requirements). For purposes of this article, I am not addressing the related practice of "green infrastructure," which eschews traditional "hard infrastructure" installed to support urban development—such as curbs, gutters, and impervious drains—and prefers alternatives such as grassy swales, vegetative buffers, and permeable pavements. See generally U.S. ENVTL. PROT. AGENCY, MANAGING WET WEATHER WITH GREEN INFRASTRUCTURE: ACTION STRATEGY 2008 (2008), available at <http://www.epa.gov/npdes/pubs/gi-action-strategy.pdf>; U.S. EPA, Basic Information: Green Communities, <http://www.epa.gov/greenkit/basicinformation.htm> (last visited Feb. 17, 2009).

8. Ecosystem services are the economically valuable benefits humans derive from ecological resources directly, such as storm surge mitigation provided by coastal dunes and marshes, and indirectly, such as nutrient cycling that supports crop production. NATURE'S SERVICES: SOCIETAL DEPENDENCE ON NATURAL ECOSYSTEMS 3–5 (Gretchen C. Daily ed., 1997). Natural capital consists of the ecological resources that produce these service values, such as forests, riparian habitat, and wetlands. *Id.* at 13. For the seminal discussion, see *id.* For more extensive examinations of the status and future of ecosystem services and natural capital in law and legal scholarship, see J.B. RUHL, STEVEN KRAFT & CHRISTOPHER LANT, THE LAW AND POLICY OF ECOSYSTEM SERVICES (2007); J.B. Ruhl & James Salzman, *The Law and Policy Beginnings of Ecosystem Services*, 22 J. LAND USE & ENVTL. L. 157 (2007).

9. See INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* note 3, at 13.

10. The ESA has been referred to as the "pit bull" of environmental laws. See, e.g., Steven P. Quarles, *The Pit Bull Goes to School*, 15 ENVTL. F. 55, 55 (1998) (discussing the origins of this reputation). For additional historical context highlighting the Act's "overbearing statutory certainty," see Steven P. Quarles & Thomas R. Lundquist, *The Pronounced Presence and Insistent Issues of the ESA*, 16 NAT. RESOURCES & ENV'T 59 (2001).

climate change, urbanization, and ecological fragmentation. As powerful as it is when applied to acts that directly degrade intact habitat, it becomes unwieldy and ineffective when causal mechanisms are indirect (as in greenhouse gas emissions), not generally associated with federal agency funding or authorization actions (as in green building), or not generally associated with ecosystem attributes that support species well-being (as in managing for ecosystem services).

Part III of the article argues that the structural constraints described in Part II serve a salutary purpose. The ESA has been a success story in federal environmental law for contexts in which habitat condition is closely linked to species condition and the cause of habitat degradation is direct and easily identified.¹¹ Its resounding success there,¹² however, has led to the misperception that it can duplicate that record anywhere and for any reason a species is at risk. But the agencies delegated to administer the ESA, the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS),¹³ cannot so easily flex the ESA to reach emerging policy realms like greenhouse gas emissions regulation. Rather, unlike the congressional design of the Clean Air Act,¹⁴ which the Supreme Court recently described as built around the flexibility needed to broaden its regulatory scope to accommodate new threats like climate change,¹⁵ the congressional design of the ESA is better understood as to keep it powerful but narrow in scope. That trade-off might keep the ESA from addressing every source of stress affecting species, but it also keeps the statute robust and durable for addressing a particular category of stress—the conversion of intact habitat to other uses—more effectively than any other environmental law has accomplished.

11. See J. Michael Scott et al., *By the Numbers, in THE ENDANGERED SPECIES ACT AT THIRTY*, *supra* note 2, at 16, 29–32. While few species identified for protection under the ESA have recovered to full health, the habitat conservation effects of the statute are credited with preventing the vast majority of such species from ultimate extinction. *Id.*

12. *Id.*

13. 50 C.F.R. § 402.01(b) (2008). The FWS administers the ESA for all terrestrial, freshwater, and certain other specified species, and the NMFS (also known as NOAA-Fisheries) administers the ESA for most marine species and anadromous fish. *See id.*

14. Clean Air Act, 42 U.S.C. §§ 7401–7671q (2000).

15. *Massachusetts v. EPA*, 127 S. Ct. 1438, 1462 (2007). In *Massachusetts v. EPA*, the majority explained that

[w]hile the Congresses that drafted [the Clean Air Act] might not have appreciated the possibility that burning fossil fuels could lead to global warming, they did understand that without regulatory flexibility, changing circumstances and scientific developments would soon render the Clean Air Act obsolete. The broad language . . . reflects an intentional effort to confer the flexibility necessary to forestall such obsolescence.

Id.

Extending from that theme, Part IV argues that the FWS and NMFS should not attempt to push the ESA into taking a leading role in effectuating policy themes like greenhouse gas mitigation, green building, and ecosystem service valuation. Rather, the agencies should consolidate the ESA's power into doing what it does best—protecting habitat for species. This is not to say that the ESA has no role in the development of policy regarding climate change, green building, or ecosystem services. Rather, creative consolidation and leveraging of the ESA's habitat protection power could support the formulation of effective measures for pursuing those and similar policy objectives. Ultimately, however, to keep the ESA relevant, the Obama Administration must keep its eye on habitat.

II. THE PRACTICAL BOUNDARIES OF ESA REGULATORY POWER

The central purpose of the ESA is to “provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved.”¹⁶ The FWS and NMFS administer several core programs aimed toward that objective:

- *The Listing Programs*: Section 4 authorizes the agencies to identify “endangered” and “threatened” species,¹⁷ known as the listing function,¹⁸ and then to designate “critical habitat”¹⁹ and develop “recovery plans”²⁰ for these species.
- *Interagency Consultation and the Jeopardy Prohibition*: Section 7 requires all federal agencies to “consult” with the FWS or NMFS (depending on the species) to ensure that actions they carry out, fund, or authorize do not

16. 16 U.S.C. § 1531(b) (2006).

17. *Id.* § 1532(6), (20).

18. *Id.* § 1522(a)(1). For a description of the listing process, see generally LIEBESMAN & PETERSEN, *supra* note 2, at 15–20; STANFORD ENVTL. LAW SOC'Y, *supra* note 2, at 38–58; SULLINS, *supra* note 2, at 11–25; J.B. Ruhl, *Section 4 of the ESA: The Keystone of Species Protection Law*, in LAW, POLICY, AND PERSPECTIVES, *supra* note 2, at 19, 19–33.

19. 16 U.S.C. § 1533(a)(3). For a description of the critical habitat designation process, see generally LIEBESMAN & PETERSEN, *supra* note 2, at 20–24; STANFORD ENVTL. LAW SOC'Y, *supra* note 2, at 59–69; SULLINS, *supra* note 2, at 26–28; Federico Cheever, *Endangered Species Act: Critical Habitat*, in LAW, POLICY, AND PERSPECTIVES, *supra* note 2, at 47; Murray D. Feldman & Michael J. Brennan, *The Growing Importance of Critical Habitat for Species Conservation*, 16 NAT. RESOURCES & ENV'T 88 *passim* (2001).

20. 16 U.S.C. § 1533(f). For a description of the recovery plan process, see generally LIEBESMAN & PETERSEN, *supra* note 2, at 24–26; STANFORD ENVTL. LAW SOC'Y, *supra* note 2, at 71–77; SULLINS, *supra* note 2, at 34–37; John M. Volkman, *Recovery Planning*, in LAW, POLICY, AND PERSPECTIVES, *supra* note 2, at 71.

“jeopardize” the continued existence of listed species or “adversely modify” their critical habitat.²¹

- *The Take Prohibition*: Section 9 requires that all persons, including all private and public entities subject to federal jurisdiction, avoid committing “take” of listed species of fish and wildlife.²²
- *Incidental Take Authorizations*: Sections 7 (for federal agency actions)²³ and 10 (for actions not subject to section 7)²⁴ establish a procedure and criteria for the FWS and NMFS to approve “incidental take” of listed species.²⁵

These programs generate the regulatory firepower needed to intervene in several categories of environmental change that cause species decline: “(A) the present or threatened destruction, modification, or curtailment of . . . habitat . . . ; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; . . . [and.] (E) other natural or manmade factors”²⁶ Of course, this authority is only useful in circumstances where intervention is feasible and to the extent it is effective. For example, habitat loss, the leading cause of species decline,²⁷ is often the result of easily identifiable human-induced factors susceptible to

21. 16 U.S.C. § 1536(a)(2). For a description of the interagency consultation process, see generally LIEBESMAN & PETERSEN, *supra* note 2, at 27–39; STANFORD ENVTL. LAW SOC’Y, *supra* note 2, at 83–103; SULLINS, *supra* note 2, at 59–86; Marilyn Averill, *Protecting Species Through Interagency Cooperation*, in LAW, POLICY, AND PERSPECTIVES, *supra* note 2, at 87.

22. 16 U.S.C. § 1538(a)(1). For a description of the cases developing the legal standards for what constitutes “take,” see generally LIEBESMAN & PETERSEN, *supra* note 2, at 39–46; STANFORD ENVTL. LAW SOC’Y, *supra* note 2, at 104–12; SULLINS, *supra* note 2, at 44–54; Alan M. Glen & Craig M. Douglas, *Taking Species: Difficult Questions of Proximity and Degree*, 16 NAT. RESOURCES & ENV’T 65 *passim* (2001); Gina Guy, *Take Prohibitions and Section 9*, in LAW, POLICY, AND PERSPECTIVES, *supra* note 2, at 191; Steven P. Quarles & Thomas R. Lundquist, *When Do Land Use Activities “Take” Listed Wildlife under ESA Section 9 and the “Harm” Regulation?*, in LAW, POLICY, AND PERSPECTIVES, *supra* note 2, at 207.

23. 16 U.S.C. § 1536(b)(4).

24. *Id.* § 1539(a)(1).

25. “Incidental take,” although not explicitly defined in a specific statutory provision, is described in section 10 of the statute as take that is “incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.” *Id.* § 1539(a)(1)(B). The FWS, for example, has adopted this meaning in regulations implementing section 7’s incidental take authorization. 50 C.F.R. § 402.02 (2008). For a description of the incidental take authorization procedures, see generally LIEBESMAN & PETERSEN, *supra* note 2, at 46–50; STANFORD ENVTL. LAW SOC’Y, *supra* note 2, at 127–73; SULLINS, *supra* note 2, at 87–102.

26. 16 U.S.C. § 1533(a)(1)(A)–(E). These are the factors upon which listing decisions are made.

27. See David Wilcove et al., *Quantifying Threats to Imperiled Species in the United States*, 48 BIOSCIENCE 607, 609, 609 tbl.2 (1998).

discrete and effective regulation.²⁸ By contrast, invasive species, the runner-up in causes of species decline,²⁹ typically present exceedingly complex causes and solutions,³⁰ meaning that there is usually no identifiable regulatory target. As a practical matter, three circumstances largely define this divide between when the ESA is at its most and least effective: (1) the nature of the causal mechanism leading to species decline, (2) the degree of federal presence in that causal mechanism, and (3) the closeness of match between the ESA's species-specific focus and the ecosystem management policy objective.

A. Causal Mechanisms

The two regulatory arms of the ESA, the take prohibition and the jeopardy prohibition, are limited in scope by demanding burdens of proof that place tremendous stress on the statute when the cause of a species' decline involves indirect, diffuse, or cumulative mechanisms.³¹ The take prohibition, for example, instructs that "with respect to any endangered species of fish or wildlife . . . it is unlawful for any person subject to the jurisdiction of the United States to . . . take any such species within the United States or the territorial sea of the United States."³² This broad prohibition applies to all federal, state, and local governments and all private organizations and individuals,³³ anywhere "within the United States," on public and private lands alike. And through the statutory definition of "take," it applies to any acts that "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" the protected species.³⁴ From that list of prohibited activities, moreover, the FWS and NMFS have by

28. Indeed, this is the source of the statute's "pit bull" status and largely the reason it is so controversial—discrete actions directly impairing habitat of protected species make for easy targets of ESA regulation. See Glen & Douglas, *supra* note 22, at 68 (discussing the proof and causation requirements necessary to demonstrate harm).

29. See Wilcove et al., *supra* note 27, at 609, 609 tbl.2.

30. See Peter M. Vitousek et al., *Biological Invasions as Global Environmental Change*, 84 AM. SCIENTIST 468, 472–77 (1996). For a series of articles covering the invasive species issue comprehensively, see generally *Special Section: Population Biology of Invasive Species*, 17 CONSERVATION BIOLOGY 24–92 (Fred W. Allendorf & Laura Lundquist eds., 2003).

31. I have explored this feature of the ESA in connection specifically with greenhouse gas emissions in J.B. Ruhl, *Climate Change and the Endangered Species Act: Building Bridges to the No-Analog Future*, 88 B.U. L. REV. 1, 39–49 (2008), from which the discussion in this article is adapted.

32. 16 U.S.C. § 1538(a)(1), (a)(1)(B) (2006).

33. All of these entities fit the ESA's definition of "person." See *id.* § 1532(13).

34. *Id.* § 1532(19).

regulation defined “harm” to include any modification of the species’ habitat that “actually kills or injures” individuals of the species “by significantly impairing essential behavioral patterns.”³⁵

Although the United States Supreme Court upheld the regulatory definition of “harm” in *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon*,³⁶ the Court placed significant brakes on the prosecution of take claims in indirect causation scenarios. The harm definition extends the take prohibition from cases in which the action causes direct death or injury (e.g., hunting, shooting, and trapping), to cases in which causality is indirect—i.e., loss of habitat that leads in some way to actual death or injury. However, theories of indirect take can become quite attenuated and speculative.³⁷ The Court, in *Sweet Home*, found it appropriate in such cases to impose the burden of proof on the proponent of the indirect harm theory. Thus, the majority emphasized that the harm rule incorporates “but for” causation, with “every term in the regulation’s definition of ‘harm’ . . . subservient to the phrase ‘an act which actually kills or injures wildlife.’”³⁸ Furthermore, the term should “be read to incorporate ordinary requirements of proximate causation and foreseeability.”³⁹ Since the Court established these tort-like evidentiary burdens, the lower courts have steadfastly refused to enforce the take prohibition based on attenuated indirect take theories, enjoining case-specific instances of take only when death or injury was proven to be likely and attributable to the defendant’s actions.⁴⁰

35. 50 C.F.R. § 17.3 (2008) (FWS definition); *id.* § 222.102 (NMFS definition).

36. *Babbitt v. Sweet Home Chapter of Cmty. for a Great Or.*, 515 U.S. 687, 704 (1995).

37. *See Morrill v. Lujan*, 802 F. Supp. 424, 430–31 (S.D. Ala. 1992) (rejecting the ESA claim for injunctive relief against a new subdivision based on the theory that some of the home owners would have pet cats, some of the cats would wander into the habitat of a listed mouse, and some of those cats would kill some of the mice). In the settlement of another round of litigation initiated following the denial of the injunction request, the developer in *Morrill* nonetheless agreed to prohibit house cats in the development. *See* William H. Satterfield et al., *Who’s Afraid of the Big Bad Beach Mouse?*, 8 NAT. RESOURCES & ENV’T 13, 15 (1993) (citing *Developer Agrees to Protect Beach Mice*, BIRMINGHAM NEWS, Jan. 19, 1993).

38. *Sweet Home*, 515 U.S. at 700 n.13 (quoting 50 C.F.R. § 17.3).

39. *Id.* at 696–97 n.9. In her concurrence, Justice O’Connor was more concise, limiting the scope of the harm rule to “significant habitat modification that causes actual, as opposed to hypothetical or speculative, death or injury to identifiable protected animals.” *Id.* at 708–09 (O’Connor, J., concurring).

40. For a thorough survey of the post-*Sweet Home* cases, see Glen & Douglas, *supra* note 22, at 68–69. For contrasting views on the feasibility of prosecuting take prohibition cases against sources of greenhouse gas emissions, compare Ruhl, *supra* note 31, at 39–42 (arguing that the agencies should exercise prosecutorial discretion not to pursue such cases), with Sarah

Similarly, the jeopardy prohibition becomes difficult to apply in complex indirect causation scenarios. The ESA requires that federal agencies ensure actions they authorize, fund, or carry out are “not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined . . . to be critical.”⁴¹ Agency regulations define “jeopardize” as “to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.”⁴² But *indirect* effects are defined as “those that are caused by the proposed action and are later in time, but still are reasonably certain to occur.”⁴³

The “reasonably certain to occur” causal burden constrains the use of jeopardy analysis when macro-scale theories of indirect causation do not translate well into evidence of micro-scale causation. At the macro-scale, for example, it is easy to construct a theory of jeopardy causation for greenhouse gas emissions: power plants and other federally-authorized sources emit greenhouse gases (a direct effect of the action), greenhouse gases are reasonably certain to warm the troposphere (an indirect effect of the action), a warming troposphere is reasonably certain to adversely alter ecological conditions, and it is reasonably expected that such ecological changes will cause some species to decline to the point of jeopardy. At the micro-scale, however, it becomes difficult to tag any individual source of emissions as the jeopardizing agent for a species residing potentially thousands of miles away.⁴⁴

This is not to say that the FWS and NMFS can simply ignore the macro-scale effects of greenhouse gas emissions and other complex indirect causal agents. They *must* list species as threatened or

Jane Morath, *The Endangered Species Act: A New Avenue for Climate Change Litigation?*, 29 PUB. LANDS & RESOURCES L. REV. 23, 35–40 (2008) (describing how section 9 could effectively be used to regulate emissions through court injunctions).

41. 16 U.S.C. § 1536(a)(2) (2006).

42. 50 C.F.R. § 402.02 (2008).

43. *Id.*

44. As the U.S. Geological Survey recently stated, “It is currently beyond the scope of existing science to identify a specific source of CO₂ emissions and designate it as a cause of specific climate impacts at an exact location.” Memorandum from Mark D. Meyers, Dir., U.S. Geological Survey, to Dir., Fish & Wildlife Serv., on The Challenges of Linking Carbon Emissions, Atmospheric Greenhouse Gas Concentrations, Global Warming, and Consequential Impacts 2 (May 14, 2008), available at http://www.doi.gov/issues/polar_bears/challengesoflinkingcarbonemissions3.pdf.

endangered by the effects of climate change, invasive species, and similar threats.⁴⁵ Moreover, they *must* consider macro-scale indirect effects when preparing recovery plans, conducting interagency jeopardy consultations, and reviewing incidental take permits.⁴⁶ Rather, when causal mechanisms operate primarily on the macro-scale through indirect, diffuse, cumulative effects, applications of the take and jeopardy prohibitions at the micro-scale—to specific emission sources, buildings, or land uses—tend to stretch the causation analysis beyond the ESA’s comfort zone.

B. Federal Presence

Even if the FWS and NMFS were to decide to aggressively use the jeopardy prohibition to regulate indirect causal mechanisms at micro-scales, notwithstanding the difficulty of satisfying burdens of proof, another constraint is that the prohibition applies only to actions federal agencies authorize, fund, or carry out. As broad and deep as federal agencies have reached into the American economy and society, many sources of species decline remain outside the scope of federal agency “action,” as so defined. General regulation of a field through federal standards does not trigger the need for inter-agency consultation on non-federal actions that must comply with

45. FWS and NOAA have each listed species based on threats from climate change impacts. *See, e.g.*, Determination of Threatened Status for the Polar Bear (*Ursus maritimus*) Throughout Its Range, 73 Fed. Reg. 28,212 (May 15, 2008); Endangered and Threatened Species: Final Listing Determinations for Elkhorn Coral and Staghorn Coral, 71 Fed. Reg. 26,852 (May 9, 2006). For the argument that they must do so even if the ESA’s regulatory programs can do little about greenhouse gas emissions, see Ruhl, *supra* note 31, at 32–35. Indeed, at a press conference announcing the FWS polar bear listing, Secretary of the Interior Dirk Kempthorne warned that “while the legal standards under the ESA compel me to list the polar bear as threatened, I want to make clear that this listing will not stop global climate change or prevent any sea ice from melting.” Press Release, U.S. Dep’t of the Interior, Office of the Sec’y, Secretary Kempthorne Announces Decision to Protect Polar Bears under Endangered Species Act (May 14, 2008), *available at* http://www.doi.gov/news/08_News_Releases/080514a.html. The Obama Administration has not changed course in this regard. On May 8, 2009, Secretary of the Interior Ken Salazar announced the agency’s decision to not provide additional protections to the polar bear, proclaiming that “the Endangered Species Act is not the proper mechanism for controlling our nation’s carbon emissions.” Press Release, U.S. Fish & Wildlife Serv., Salazar Retains Conservation Rule for Polar Bears Underlines Need for Comprehensive Energy and Climate Legislation (May 8, 2009), *available at* <http://www.fws.gov/news/NewsReleases/showNews.cfm?newsId=20FB90B6-A188-DB01-04788E0892D91701>.

46. *See* Ruhl, *supra* note 31, at 37–53; *see, e.g.*, *Natural Res. Def. Council v. Kempthorne*, 506 F. Supp. 2d 322, 369–70 (E.D. Cal. 2007) (finding that the FWS acted arbitrarily and capriciously by failing to address the effects of climate change in an interagency jeopardy consultation).

those standards; rather, a federal agency must fund or authorize the specific non-federal action.

For example, the construction and operation of buildings are significant indirect causes of ecological degradation leading to species decline. Building construction consumes wood and other raw materials, the production of which can adversely affect ecological integrity, and building operations consume electricity, the production source of which may be emitting greenhouse gases.⁴⁷ Green building techniques are designed to promote the use of recycled building products and energy efficient operations, and thus could indirectly promote recovery of listed species.⁴⁸ Yet green building techniques have been formulated primarily by private organizations and codified, if at all, primarily by state and local governments.⁴⁹ It is unlikely that federal agencies will ever have much to do directly with the authorization or funding of non-federal buildings *qua* buildings—land use regulation, including issuance of zoning and building permits, is traditionally the domain of state and local governments.⁵⁰ While the federal government has exercised limited regulatory jurisdiction over green building design through codified standards, such as for energy efficiency,⁵¹ it has not ventured into promulgating comprehensive building permit programs of any kind, much less specifically for green building.⁵² In the absence of that federal action nexus, the FWS and

47. See U.S. CLIMATE CHANGE SCI. PROGRAM, THE NORTH AMERICAN CARBON BUDGET AND IMPLICATIONS FOR THE GLOBAL CARBON CYCLE 6 (2007). Electricity consumption by buildings, which accounts for two-thirds of all electricity consumed in North America, is one of the largest factors contributing to North American greenhouse gas emissions. See *id.*

48. I explore the intersection of the ESA and green building policy in more detail in J.B. Ruhl, *Cities, Green Construction, and the Endangered Species Act*, 27 VA. ENVTL. L.J. (forthcoming May 2009).

49. See Circo, *supra* note 7, *passim*.

50. See *Solid Waste Agency of N. Cook County v. U.S. Army Corps of Eng'rs*, 531 U.S. 159, 173–74 (2001) (describing the “States’ traditional and primary power over land and water use”).

51. See 42 U.S.C. §§ 6832(15), 6833(a)–(b) (2006). The Energy Policy Act of 1992 requires states to compare energy efficiency standards in their respective residential and commercial building codes to model codes, such as the Council on American Building Officials’ Model Energy Code, including as those codes are periodically updated. See *id.*

52. See Bronin, *supra* note 7, at 246–59; Circo, *supra* note 7, at 771–73. The federal government has actively promulgated green building standards for federal buildings. See, e.g., 10 C.F.R. pt. 435 (2008) (stating mandatory energy conservation standards for federal buildings). The National Institute of Building Design’s Whole Building Design Guide website follows, among many other things, the development of federal green building mandates. See Whole Building Design Guide, Federal Mandates, http://www.wbdg.org/references/federal_mandates.php (last visited Mar. 7, 2009).

NMFS would be hard-pressed to use the ESA to require green building on the basis that it is necessary to avoid jeopardy of a species—the causal mechanisms are decidedly indirect to begin with (which also limits the reach of the take prohibition to mandate green building), and there is no broad federal permitting program nexus through which to reach green building activity in any event.

C. Species-Specific Context

Ultimately, although the ESA is intended to conserve ecosystems, it is only the ecosystems of listed endangered and threatened species that the statute reaches. Moreover, even in this sense, the conservation of ecosystems is incidental to the conservation of listed species. Indeed, the word “ecosystem” appears only once in the statute, in the purpose statement, and from there the statute is fixated on species. The FWS and NMFS list *species*, designate critical habitat of *species*, prepare *species* recovery plans, and take and jeopardy of *species* are prohibited. If particular ecosystem management polices do not somehow tie into one of the ESA’s species-specific programs, the statute provides no direct basis for the FWS and NMFS to pursue them.

To be sure, where species conservation demands ecosystem conservation, the ESA works well to serve its purpose. But some policies designed to promote ecosystem conservation, such as making greater use of ecosystem services valuation in decision-making, have little to do with conservation of listed species. At its core, the ecosystem services concept is anthropocentric and utilitarian.⁵³ There may in some cases be a serendipitous match between ecosystem conservation on behalf of a listed species and ecosystem conservation on behalf of human ecosystem service values, but there might just as often be a conflict between the two, in which case the FWS and NMFS must keep their eyes on species conservation as the primary goal. More to the point, however, is the fact that the FWS and NMFS cannot do anything directly under the ESA to promote sustainability

53. RUHL, KRAFT & LANT, *supra* note 8, at 15.

It is important not to confuse ecosystem functions, which are ubiquitous, with ecosystem services, which are the consequence of only some ecosystem functions. The critical difference between the two, and which makes the development of ecosystem services policy both complicated and controversial, is that ecosystem services have relevance only to the extent human populations benefit from them. They are purely anthropocentric.

Id.

of ecosystem services, or any other ecosystem management policy, if doing so cannot be linked to conservation of a listed species.

III. KEEPING THE ESA FOCUSED ON HABITAT

So what? So what if the ESA cannot easily be used to regulate greenhouse gas emissions, require green building, and demand that ecosystem services be valued? The likely response is that if the problems these policies are designed to mitigate are in fact causing species decline, the nation's most powerful species conservation law ought to play a leading role in promoting the policies. But this approach conflates the purpose of the ESA and the power of the ESA. The purpose of the statute is to conserve ecosystems on which listed species depend for survival, but the power of the statute to do so is derived from the narrow focus around which it is designed.

The ESA, perhaps to the chagrin of its most ardent supporters, is at bottom a harm-preventing law, not a benefit-mandating law. Causing take or jeopardy of species is prohibited, but promoting the recovery of species is nowhere required by the statute. The courts have interpreted recovery plans, for example, to have no mandatory effect on federal agencies, much less anyone else.⁵⁴ They are plans, and that's it. The criteria for issuance of incidental take permits require little more than that the effects of the take are minimized and mitigated "to the maximum extent practicable,"⁵⁵ and do not require that the permittee provide net benefits to the species.⁵⁶ Even section 7(a)(1) of the statute, which requires federal agencies to "utilize their authorities . . . by carrying out programs for the conservation of endangered species,"⁵⁷ has been interpreted by the FWS, NMFS, and courts to require essentially no specific affirmative efforts to promote

54. See LIEBESMAN & PETERSEN, *supra* note 2, at 25–26; STANFORD ENVTL. LAW SOC'Y, *supra* note 2, at 76–77.

55. 16 U.S.C. § 1539(a)(2)(B)(ii) (2006); *see also* Nat'l Wildlife Fed. v. Norton, 306 F. Supp. 2d 920, 928 (E.D. Cal. 2004) (agreeing with the FWS that full mitigation of take effects is not required if it is not practicable).

56. See 16 U.S.C. § 1539(a)(2)(B). For example, incidental permits issued under section 10(a)(1)(B) need only ensure that the permittee's actions "will not appreciably reduce the likelihood of the survival and recovery of the species in the wild." *Id.* § 1539(a)(2)(B)(iv). Courts have declined to interpret this standard as requiring net benefits to the species. See *Ctr. for Biological Diversity v. FWS*, 202 F. Supp. 2d 594, 624–46 (W.D. Tex. 2002).

57. 16 U.S.C. § 1536(a)(1).

species recovery.⁵⁸ The ESA punishes those who do bad to species, but does nothing to make anyone do good.

Yet it is important to have such a law, one that calls off business-as-usual when business-as-usual has led a species to the brink, and which, when that alarm is sounded, bears down on the most important factor—keeping intact habitat of listed species at bay from conversion to other land uses. To be sure, there are many flaws in the way the ESA works even in this respect, but I would rather we focus on improving the ESA in this narrow sense than trying to use it to turn the FWS and NMFS into the nation’s greenhouse gas and green building police. Putting aside the political cost the agencies would pay were they to try that, the reality is that they are simply not designed or equipped to do so. The FWS and NMFS are resource conservation agencies, not pollution control or building design agencies.

As the Supreme Court has pithily observed, “Agencies, like legislatures, do not generally resolve massive problems in one fell regulatory swoop. They instead whittle away at them over time, refining their approach as circumstances change and as they develop a more-nuanced understanding of how best to proceed.”⁵⁹ The ESA was not designed to resolve all sources of species’ decline in “one fell regulatory swoop,” and the FWS and NMFS are not the only agencies whittling away at the large problem of ecosystem degradation. They will best serve the purpose of the ESA if they focus on whittling at their part of the problem—conserving intact habitat—and coordinating with other federal, state, and local agencies about how doing so can contribute to the comprehensive development of climate change, green building, and ecosystem services policies.

IV. CONSOLIDATING AND LEVERAGING ESA-BASED HABITAT CONSERVATION

Although the ESA is poorly-equipped, and arguably not even intended, to directly implement policies like greenhouse gas regulation, green building, and ecosystem service valuation, the habitat protection function of the ESA can contribute directly to the broader goals of such policies (responding to climate change,

58. See J.B. Ruhl, *Section 7(a)(1) of the “New” Endangered Species Act: Rediscovering and Redefining the Untapped Power of Federal Agencies’ Duty to Conserve Species*, 25 ENVTL. L. 1107, 1107 (1995) (explaining the legal background of section 7(a)(1) and proposing a more demanding standard).

59. *Massachusetts v. EPA*, 127 S. Ct. 1438, 1457 (2007) (citation omitted).

urbanization, and ecological degradation, respectively) and indirectly to their implementation. The FWS and NMFS can promote both effects by consolidating the habitat protection function to identify direct connections between habitat conservation and climate change, urbanization, or ecosystem services, and then leveraging the link to habitat to provide additional policy support where possible.

A. Consolidating Habitat Conservation

By consolidating habitat conservation, I mean aggressively using the habitat protection opportunities of the statute directly in support of the policy goals of responding to climate change, urbanization, and ecological degradation. Its focus may be narrow, but the ESA is nonetheless equipped to directly address effects of climate change, urbanization, and ecological degradation through its habitat protection function.

For example, the ESA authorizes the FWS and NMFS to designate critical habitat as including “specific areas outside the geographical area occupied by the species at the time it is listed . . . , upon a determination by the [FWS or NMFS] that such areas are essential for the conservation of the species.”⁶⁰ This could provide the FWS and NMFS a powerful mechanism for responding aggressively to ecological transitions caused by climate change. To the extent that models can predict with reasonable certainty where a species might successfully migrate to adapt to ecological changes brought about by climate change, a credible interpretation of the provision would allow the agency to “reserve” those areas through critical habitat designations.⁶¹ Those designations would help reduce the effects of human land uses in such areas, thus securing a greater chance for the

60. 16 U.S.C. § 1532(5)(A)(ii) (2006).

61. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Preble’s Meadow Jumping Mouse (*Zapus hudsonius preblei*), 68 Fed. Reg. 37,276, 37,285 (June 23, 2003) (codified at 50 C.F.R. §§ 17.11, 17.40, 17.95 (2008)). The FWS took an approach like this with respect to the Preble’s meadow jumping mouse, deciding to include small mountain streams in the species’ critical habitat, even though larger streams are more important to the species, on the ground that “Preble’s populations along mountain streams may be less subject to certain threats including . . . long-term climate change.” *Id.* On the other hand, it declined to do so for the Spreading navarretia plant. A commenter suggested that the critical habitat should “include areas of unoccupied suitable habitat that would provide for recovery opportunities, including . . . migration in response to climate change,” but the agency merely observed that “critical habitat designations do not signal that habitat outside the designation is unimportant or may not be required for recovery.” Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for *Navarretia Fossalis* (Spreading Navarretia), 70 Fed. Reg. 60,658, 60,662 (Oct. 18, 2005) (codified at 50 C.F.R. §§ 17.12, 17.96 (2008)).

species to withstand climate change transitions and establish a viable population in its new ecological home.

Similarly, although the ESA may not be useful for controlling the indirect effects of urbanization, it has proven quite effective in promoting local jurisdictions to integrate the habitat effects of expanding urbanization into land use decisions. The greenhouse gas emissions effect of a building's electricity consumption may be far beyond the effective reach of the take and jeopardy prohibitions, but the habitat conversion effects of the building's land footprint are not. Numerous state and local jurisdictions have entered into "regional habitat conservation plans," which are essentially large-scale incidental take permits administered to manage ESA compliance for public and private land development within the jurisdiction.⁶² By promoting jurisdiction-wide attention to habitat conservation, the regional permitting process can lead directly to less urbanization, which helps reduce greenhouse gas emissions and preserve natural capital, and can also indirectly spur attention to land use and building design techniques that are compatible with reducing greenhouse gas emissions and sustaining ecosystem services.

B. Leveraging Habitat Conservation

By leveraging habitat conservation, I mean taking advantage of the regulatory consequences of habitat protection, once it is in place under the take and jeopardy prohibitions, to promote other policies working toward the same ends. The point is that while the ESA may not be able to *require* reduction of greenhouse gas emissions, use of green building techniques, or management for ecosystem services, so long as the primary regulatory target of habitat protection is met, the ESA is by no means out of the picture for promoting these other policy objectives.

For example, conservation banking—where one landowner voluntarily conserves habitat to "market" as "credits" to other landowners in need of mitigation habitat required for issuance of an incidental take permit—is increasingly the mitigation method of

62. See TIMOTHY BEATLY, HABITAT CONSERVATION PLANNING: ENDANGERED SPECIES AND URBAN GROWTH 23–39 (1994) (providing a survey of early regional permits). For contrasting views on the regional permit experience, compare Alejandro E. Camacho, *Can Regulation Evolve? Lessons from a Study in Maladaptive Management*, 55 UCLA L. REV. 293 (2007) (criticizing regional permits), with Robert D. Thornton, *Habitat Conservation Plans: Frayed Safety Nets or Creative Partnerships?*, 16 NAT. RESOURCES & ENV'T 94 (2001) (favoring regional permits).

choice under the ESA.⁶³ Although a habitat conservation bank may only market habitat credits under the ESA, it may also be able to market credits for carbon sequestration and ecosystem services as similar compliance techniques are developed in furtherance of climate change and ecosystem services policies. The FWS and NMFS could point to this synergy as a beneficial (and potentially profitable) effect of engaging in habitat conservation banking.

Other ESA actions provide opportunities for the agencies to highlight this kind of synergy. When designating critical habitat for listed species, for example, the agencies must take into account the “economic impact” of extending that status to the identified area. To the extent that the protected status of the critical habitat could enhance its capacity to provide carbon sequestration and ecosystem services, those benefits should enter into the economic impact analysis.⁶⁴ Similarly, when designing recovery plans for species, the FWS and NMFS could point to the incidental benefits species-based habitat conservation provides for carbon sequestration and ecosystem service values, thus illustrating that the cost accounting of habitat conservation for species recovery purposes should recognize the economic benefits of these collateral effects.⁶⁵ Recovery plans for species listed on the basis of climate-forced impacts, moreover, could point to the macro-scale benefits green building and greenhouse gas emission reductions are likely to have for the species. Hence, once the FWS and NMFS have fulfilled the primary habitat protection

63. See Guidance for the Establishment, Use, and Operation of Conservation Banks, 68 Fed. Reg. 24,753 (May 8, 2003). For an overview of ESA conservation banking policy and practice, see J.B. Ruhl, Alan Glen & David Hartman, *A Practical Guide to Habitat Banking Law and Policy*, 20 NAT. RESOURCES & ENV'T 26, 26 (2005). Caution is required in designing such habitat trading programs, however, to ensure market forces do not produce unintended consequences, such as habitat fragmentation. See Jamison E. Colburn, *Trading Spaces: Habitat “Banking” under Fish & Wildlife Service Policy*, 20 NAT. RESOURCES & ENV'T 33, 33 (2005); James Salzman & J.B. Ruhl, *Currencies and the Commodification of Environmental Law*, 53 STAN. L. REV. 607, 624–44 (2000).

64. Unfortunately, the agencies have steadfastly declined to take this approach when it has been suggested in public comments to proposed critical habitat designations, either ignoring the issue altogether or arguing that it is beyond the agencies' capacity to “monetize” such benefits and omitting any qualitative discussion of the potential for such benefits. See, e.g., Designation of Critical Habitat for *Helianthus Paradoxus* (Pecos Sunflower), 73 Fed. Reg. 17,762, 17,765 (Apr. 1, 2008) (stating the agency's inability to monetize); Revised Designation of Critical Habitat for the Tidewater Goby (*Eucyclogobius newberryi*), 73 Fed. Reg. 5,920, 5,927 (Jan. 31, 2008) (failing to mention ecosystem services in response to public comment).

65. See 16 U.S.C. § 1533(f)(1)(B)(iii) (2006) (stating that when preparing recovery plans, the agencies must provide “estimates of the . . . cost to carry out those measures needed to achieve the plan's goals”).

function of the ESA, they can put it to work in numerous ways to support policies outside the direct reach of the statute but consistent with the overall objective of species conservation.

V. CONCLUSION

The species imperilment problem has become intractable, and neither the Obama, nor any future, Administration will solve it, but rather can hope only to manage it. Few human activities, from belching power plants down to a person turning on the kitchen water tap, do not contribute in some degree to the problem. The sources of species imperilment are ubiquitous, and imperiled species are ubiquitous. This does not mean, however, that the ESA is ubiquitous. Those who fear for the ESA's enduring relevance in an increasingly complex world of species imperilment may argue that the statute must be carried and applied to each and every context in which human activity contributes in some way to species decline, but this is simply impracticable and, more importantly, not the design of the statute.

Rather, I have argued in this article that the ESA will be most effective when the FWS and NMFS use it to “whittle away” at the species imperilment problem by focusing the statute's power on what it and the agencies are best equipped to address—arresting conversion of habitat to other uses. Habitat protection on these grounds alone will contribute to broader policies such as responding to climate change, promoting green building, and valuing ecosystem services. With creative use of this focused application of the statute and through coordination with other agencies “whittling away” at these problems through their respective authorities, the FWS and NMFS can also leverage habitat protection to further support (but not require) these policy goals. In this way the ESA surely will not become ubiquitous, but it will remain relevant.