

CRITICAL HABITAT AND THE CHALLENGE OF REGULATING SMALL HARMS

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Abstract

This Article investigates how the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and the courts are implementing the Endangered Species Act's prohibition on "adverse modification" of "critical habitat." That prohibition appears to be one of environmental law's most ambitious mandates, but its actual meaning and effect are contested. Using a database of over 4,000 "biological opinions," interviews with agency staff, and a review of judicial decisions considering the adverse modification prohibition, this Article assesses the extent to which the Fish and Wildlife Service, the National Marine Fisheries Service, and the courts are relying on the adverse modification prohibition to provide habitat protection. It also assesses the extent to which these groups are providing habitat protection by invoking other Endangered Species Act provisions. This Article concludes that although agency practice and some judicial decisions substantially depart from statutory requirements, with problematic results, the agencies are still providing substantial habitat protection through other means. It then considers the implications of these findings, first for ongoing debates about Endangered Species Act implementation and reform and then for broader discussions about legal strategies for responding to small environmental harms and the incremental degradation they cause.

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INTRODUCTION

On December 7, 2010, the U.S. Fish and Wildlife Service (FWS) reluctantly¹ designated 187,157 square miles as “critical habitat” for the polar bear,² a species protected under the Endangered Species Act (ESA).³ According to FWS, this was a fairly inconsequential act. FWS predicted minimal regulatory changes,⁴ only the slightest of economic impacts,⁵ and no conservation benefit to the species.⁶ But those predictions are difficult to reconcile with the text of the ESA. The

1. Litigation had forced the agency’s hand. See News Release, U.S. Fish and Wildlife Serv., U.S. Fish and Wildlife Service Proposes Polar Bear Critical Habitat (Oct. 22, 2009), available at <http://alaska.fws.gov/fisheries/mmm/polarbear/pdf/PB%20CritHab%20Prop.NR.FINAL.pdf>.

2. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Polar Bear (*Ursus maritimus*) in the United States, 75 Fed. Reg. 76,086, 76,086 (Dec. 7, 2010) (to be codified at 50 C.F.R. pt. 17).

3. 16 U.S.C. §§ 1531–44 (2006).

4. INDUS. ECON., INC. & N. ECON., ECONOMIC ANALYSIS OF CRITICAL HABITAT DESIGNATION FOR THE POLAR BEAR IN THE UNITED STATES ES-4 (2010) (“Critical habitat is therefore not expected to result in additional regulation . . .”).

5. *Id.* (“[E]conomic impacts are forecast to be limited to additional administrative costs.”).

6. *Id.* at 7–10 (“[T]he Service does not anticipate that the designation of critical habitat will result in additional conservation requirements for the polar bear.”).

statute's protections for critical habitat appear extensive and stringent; they are, according to one prominent legal scholar, "the highest promontory in the boldest section of the strongest environmental law in the world."⁷ The potential objects of regulation are almost infinite, for greenhouse gas emissions throughout the nation threaten the polar bear's habitat.⁸ Some environmental advocates therefore hope, and some industries fear, that the designation has created a legal lever to halt some of the actions that are incrementally consigning the polar bear to extinction.⁹

The plight of the polar bear is compelling in its own right—the species has become the poster animal for climate change activism—and it also exemplifies a classic legal challenge. Many of environmental law's greatest remaining problems are caused by the cumulative effects of many actions, each of which contributes only a small increment to the larger problem.¹⁰ If the causal links between those individual actions and the larger problem are indirect, uncertain, or obscure, the problems become even harder to address.¹¹ Climate change is a classic example; although the ultimate environmental challenge is enormous, no single actor is the primary cause, and millions of actions incrementally contribute. But climate change is not the only example. The United States' greatest remaining water quality challenges arise from the cumulative effect of many sources of stormwater runoff.¹² Some of the most persistent air pollution problems derive largely from the collective emissions of millions of engines.¹³ Indeed, similar challenges pervade

7. William H. Rodgers, Jr., *Indian Tribes*, in 1 THE ENDANGERED SPECIES ACT AT THIRTY: RENEWING THE CONSERVATION PROMISE 161, 170 (Dale D. Goble et al. eds., 2005).

8. See Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Polar Bear (*Ursus maritimus*) Throughout Its Range, 73 Fed. Reg. 28,212, 28,292–93 (May 15, 2008) (to be codified at 50 C.F.R. pt. 17). The polar bear also is threatened by emissions from the rest of the world, but the ESA's extraterritorial effect is limited.

9. See, e.g., Resource Development Council for Alaska Inc., to Division of Policy and Directives Management, U.S. Fish and Wildlife Serv. (Dec. 23, 2009), available at <http://www.akrdc.org/issues/other/esa/polarbearcomments.html> (warning of a "vast disconnect between the Service's findings and assurances . . . and the intentions of [the Center for Biological Diversity] and other environmental groups"). FWS has taken pains to deny the possibility of such regulation. See *INDUS. ECON., INC. & N. ECON.*, *supra* note 4, at ES-5 ("Critical habitat designation for the polar bear will not be used by the Service as a vehicle to regulate climate change.").

10. See, e.g., William E. Odum, *Environmental Degradation and the Tyranny of Small Decisions*, 32 *BIOSCIENCE* 728, 728 (1982); J.B. Ruhl & James Salzman, *Climate Change, Dead Zones, and Massive Problems in the Administrative State: A Guide for Whittling Away*, 98 *CAL. L. REV.* 59, 64–65 (2010).

11. See Daniel C. Esty, *Toward Optimal Environmental Governance*, 74 *N.Y.U. L. REV.* 1495, 1545–46 (1999).

12. See Jonathan Cannon, *A Bargain for Clean Water*, 17 *N.Y.U. ENVTL. L.J.* 608, 608, 610–11 (2008).

13. See, e.g., Carol M. Rose, *Environmental Law Grows up (More or Less), and What Science Can Do to Help*, 9 *LEWIS & CLARK L. REV.* 273, 279–80, 283 (2005) (providing examples from water and air pollution control); Ruhl & Salzman, *supra* note 10, at 74–75

regulatory governance, as the recent economic crisis—a crisis brought on by the cumulative effect of thousands of ill-advised mortgages and risky investment decisions—made abundantly clear. Finding legal solutions for these problems is not easy,¹⁴ but it is essential.

This Article advances that search by considering the regulatory protection of critical habitat. That protection flows primarily from section 7 of the ESA, which prohibits federal agencies from taking, permitting, or funding any action “likely to . . . result in the destruction or adverse modification” of critical habitat.¹⁵ In theory, this “adverse modification” prohibition, as it is conventionally known, should address the sort of incremental environmental degradation that threatens many species, including the polar bear.¹⁶ Indeed, it appears to be one of the farthest-reaching mandates in all of environmental law.¹⁷

Actual practices, however, may be very different. To explore how the services actually protect critical habitat, I reviewed the results of approximately four thousand recent “biological opinions” prepared by FWS or the National Marine Fisheries Service (NMFS; collectively, “the services”).¹⁸ These biological opinions analyze whether a federal action will impermissibly affect critical habitat or “jeopardize” the survival of listed species.¹⁹ In practice, biological opinions have, as the Supreme Court has stated, a “virtually determinative” effect upon whether and how federal actions proceed.²⁰ I also reviewed all judicial decisions considering regulatory protections for critical habitat.²¹ Finally, I interviewed agency staff to explore their experiences with critical habitat protection. The result is an extensive empirical review of the ways critical habitat actually receives regulatory protection.²²

This inquiry begins to fill a substantial gap in the otherwise extensive literature on the ESA. Though critical habitat has been highly controversial²³—“an agony of the ESA,” in Professor Oliver Houck’s

(describing causes of urban sprawl).

14. See Stephen R. Dovers, *Sustainability: Demands on Policy*, 16 J. PUB. POL’Y 303, 312 (1997) (asserting that the difficulty “stems in large part from the inherent inability of the mainstay of most environmental policy, project oriented assessment, to handle impacts accruing from a number of separate projects”).

15. 16 U.S.C. § 1536(a)(2) (2006).

16. See *infra* Part I.

17. See Rodgers, *supra* note 7, at 170.

18. For a discussion of the process through which the services generate these opinions, see *infra* Subsection I.A.2.

19. See 16 U.S.C. § 1536(a)–(b).

20. *Bennett v. Spear*, 520 U.S. 154, 170 (1997).

21. A larger body of case law considers decisions to designate critical habitat, but my focus is on what happens after a designation is finalized.

22. While broad, the review is not comprehensive. See *infra* Part II (describing regulatory effects not addressed by this study).

23. See John Copeland Nagle, *The Effectiveness of Biodiversity Law*, 24 J. LAND USE & ENVTL. L. 203, 205 (2009) (describing critical habitat as “especially controversial”); Scott Norris, *Only 30: A Portrait of the Endangered Species Act as a Young Law*, 54 BIOSCIENCE 288,

words²⁴—the controversy has swirled primarily around critical habitat designations. Few studies have attempted to explain how the services actually protect critical habitat once it is designated, or to what effect. Perceptions vary widely. Some legal commentators have suggested that the critical habitat provisions create remarkably powerful protective mechanisms.²⁵ Some economic studies have found, or simply assumed, dramatic impacts upon regulated entities.²⁶ But the services have often claimed that the critical habitat provisions are completely redundant and that other statutory provisions obviate the need for the adverse modification prohibition.²⁷ A few studies have used regression analyses to test whether critical habitat designations lead to improvements in species status, but the results are conflicting, and the studies do not purport to explain *why* critical habitat protection is (or is not) producing results.²⁸ Other researchers have used case studies to explore ways in which critical habitat can provide protection; however, as with any case study, the potential for drawing generalized conclusions is limited.²⁹ Therefore, the process of implementing the adverse modification

291 (2004) (“If the Endangered Species Act . . . has become a battleground, the front line is the issue of critical habitat.”).

24. Oliver A. Houck, *The Endangered Species Act and Its Implementation by the U.S. Departments of Interior and Commerce*, 64 U. COLO. L. REV. 277, 297 (1993).

25. See, e.g., James Salzman, *Evolution and Application of Critical Habitat Under the Endangered Species Act*, 14 HARV. ENVTL. L. REV. 311, 311 (1990) (describing “critical habitat designation and protection” as “the ESA’s most controversial and influential enforcement tool”); Rodgers, *supra* note 7.

26. John M. Quigley & Aaron M. Swoboda, *The Urban Impacts of the Endangered Species Act: A General Equilibrium Analysis*, 61 J. URB. ECON. 299, 304 (2007) (“For simplicity, we assume that lands designated as critical habitat cannot be used to produce housing at all.”); Jeffrey E. Zabel & Robert W. Paterson, *The Effects of Critical Habitat Designation on Housing Supply: An Analysis of California Housing Construction Activity*, 46 J. REGIONAL SCI. 67, 90 (2006) (finding substantial effects even outside the designated critical habitat area).

27. Endangered and Threatened Wildlife and Plants; Notice of Intent to Clarify the Role of Habitat in Endangered Species Conservation, 64 Fed. Reg. 31,871, 31,872 (June 14, 1999) (“For almost all species, the adverse modification and jeopardy standards are the same., [sic] resulting in critical habitat being an expensive regulatory process that duplicates the protection already provided by the jeopardy standard.”). For a discussion of those other provisions, see *infra* Part I.

28. See Martin F.J. Taylor et al., *The Effectiveness of the Endangered Species Act: A Quantitative Analysis*, 55 BIOSCIENCE 360, 361 (2005) (“Critical habitat promotes species survival and recovery.”); Jeffrey J. Rachlinski, *Noah by the Numbers: An Empirical Evaluation of the Endangered Species Act*, 82 CORNELL L. REV. 356, 384 (1997) (reviewing CHARLES C. MANN & MARK L. PLUMMER, *NOAH’S CHOICE: THE FUTURE OF ENDANGERED SPECIES* (1995)) (“Designation of critical habitat appeared to benefit species, but the evidence for this proposition was weak.”). *But see* Joe Kerkvliet & Christian Langpap, *Learning from Endangered and Threatened Species Recovery Programs: A Case Study Using U.S. Endangered Species Act Recovery Scores*, 63 ECOLOGICAL ECON. 499, 506–07 (2007) (finding no causal relationship).

29. See Kieran F. Suckling & Martin Taylor, *Critical Habitat and Recovery*, in 1 THE ENDANGERED SPECIES ACT AT THIRTY: RENEWING THE CONSERVATION PROMISE, *supra* note 7, at 80–85.

prohibition remains a black box with disputed outputs. A primary purpose of this inquiry is to expose that black box's inner workings.³⁰

The results reveal a large discrepancy between statutory requirements and actual practice. Notwithstanding statutory language that seems to mandate a major role for the adverse modification prohibition, the services have given it hardly any independent significance, instead treating the prohibition as a redundant add-on to the ESA's other protective measures.³¹ The services also have consistently treated small-scale habitat degradation as exempt from the adverse modification prohibition, even though no such exemption appears in the ESA itself.³² That approach has persisted even after a series of court cases called it into question. The services also have struggled to articulate a standard for determining what constitutes adverse modification, and in many individual biological opinions, they have offered rationales that ignore both statutory text and the incremental nature of the habitat degradation that most species face.³³ While critical habitat has assumed slightly more significance in the courts, the judiciary also has not decided how protective the critical habitat provisions should be.³⁴ The adverse modification prohibition has had some impact, notwithstanding the services' periodic assertions that critical habitat designations are just a waste of money and time. But the effects on regulatory processes, though real, have been minor and subtle.

These disparities between statutory text and actual practice are only half of the story, however. Even if the adverse modification prohibition is doing little to support regulatory protection for critical habitat, the services are invoking other provisions of the ESA as substitutes.³⁵ Those efforts are extensive and, in some ways, pragmatic and creative.³⁶ There are problems with these alternative approaches—most importantly, they seem designed to slow rather than stop habitat degradation—but they nevertheless provide substantial habitat protection, albeit not in the ways the statute itself might imply.³⁷

These paradoxical results undermine some of the classic narratives of ESA implementation and, more generally, are inconsistent with prevalent understandings of administrative agency behavior. One of the dominant narratives, raised often (though not exclusively) by opponents of the Act, suggests that the ESA creates an inflexible “command-and-

30. This problem is not limited to the ESA's critical habitat provisions. See Barton H. Thompson, Jr., *The Endangered Species Act: A Case Study in Takings & Incentives*, 49 STAN. L. REV. 305, 307 (1997) (“One problem with undertaking a case study of the ESA is that there is a scarcity of verifiable data and information.”).

31. See *infra* Part III.

32. See *infra* Section III.A.

33. See *id.*

34. See *infra* Section III.C.

35. See *infra* Section III.B.

36. See *id.*

37. See *id.*

control” regulatory scheme.³⁸ That view reflects a broader criticism alleging that environmental law is generally characterized by rigid, top-down schemes myopically implemented by tunnel-visioned agencies.³⁹ A rather different critique, often asserted by frustrated supporters of the Act’s basic goals, asserts that the ESA is a “paper tiger,”⁴⁰ which reluctant agencies implement only to the extent compelled by the citizen suits of nongovernmental litigants.⁴¹ Though these critiques may seem nearly opposite, both share an underlying cynicism about governmental implementation of the ESA—a cynicism that also typifies much of the rhetoric about regulatory governance.⁴² In both narratives, ESA implementation is fundamentally flawed, and the services are somewhat passive entities, either implementing an unreasonable statute with mindless rigidity or persistently bowing to the focused pressure of moneyed interest groups.⁴³ Not surprisingly, both narratives also call for dramatic reforms.

But neither narrative explains what the services are actually doing. The assertions of inflexibility are belied by the services’ selective disuse of a seemingly mandatory statutory provision. These narratives also cannot explain the services’ substitute approaches. Despite the conventional characterizations of ESA-based regulation as a centralized, rigid, command-and-control scheme, these alternative approaches have evolved largely through decentralized, negotiation-driven processes.⁴⁴ The “paper tiger” narrative comes closer to the mark, for the services’

38. See *infra* Section IV.A.

39. See, e.g., Richard B. Stewart, *Environmental Quality as a National Good in a Federal State*, 1997 U. CHI. LEGAL F. 199, 203, 213 (describing a “burdensome” system with “many grievous flaws”).

40. See J.B. Ruhl, *Is the Endangered Species Act Eco-Pragmatic?*, 87 MINN. L. REV. 885, 886 (2003) (explaining and rejecting this view of the ESA).

41. See, e.g., Houck, *supra* note 24, at 311 (“[T]he ESA’s prohibitions against jeopardy and habitat designation are enforced solely through citizen actions in the courts.”).

42. Even President Obama, though generally sympathetic to regulatory initiatives, has prominently criticized this scheme. See Barack Obama, Remarks by the President in State of Union Address (Jan. 25, 2011), available at <http://www.whitehouse.gov/the-press-office/2011/01/25/remarks-president-state-union-address> (suggesting that a bifurcated system of authority over salmon exemplifies a flawed “government of the past”).

43. This view parallels conceptions of agency action prevalent in some law and economics critiques of regulatory governance, in public choice theory, and, though from a different ideological perspective, in environmentalists’ arguments in favor of citizen intervention in administrative decisionmaking. See, e.g., DANIEL A. FARBER & PHILIP P. FRICKEY, *LAW AND PUBLIC CHOICE: A CRITICAL INTRODUCTION* 17–21 (1991) (describing public choice theory, which asserts a similar view and informs many of the law and economics studies); JOSEPH L. SAX, *DEFENDING THE ENVIRONMENT: A STRATEGY FOR CITIZEN ACTION* 63–64 (1971) (advocating a “fundamental realignment of power” in administrative decisionmaking via active citizen participation); Nathaniel O. Keohane et al., *The Choice of Regulatory Instruments in Environmental Policy*, 22 HARV. ENVTL. L. REV. 313, 320–21 (1998) (summarizing law and economics studies asserting that regulatory policy passively reflects external interests).

44. See *infra* Section IV.A.

chosen regulatory approaches depart from statutory text in ways that appear to compromise species protection. But the services still are providing significant habitat protection, often in the face of intense resistance, and even where external pressure from environmental groups provides, at most, a partial explanation for the services' actions.⁴⁵ The incompleteness of both of these narratives has implications for ESA reform efforts and environmental law reform more generally. Most importantly, while reforms are necessary, they need not be drastic. Existing law and institutions contain positive features worth building upon.

This Article closes by recommending several modest reforms and, in so doing, returns to one of the core dilemmas of regulating incremental environmental degradation. Any such regulatory effort must resolve when, if ever, harms are too small to address, and must establish how to compensate for the harms that escape regulatory coverage.⁴⁶ The services have never figured out a coherent solution to those dilemmas. Workable answers exist: a combination of regulatory approaches developed in several other areas of environmental law could improve the critical habitat program.⁴⁷ None of these approaches is a panacea, however; each has its critics and its flaws, and my recommendations in combination may seem to prescribe a sort of regulatory kitchen-sink soup. But the jumble is partly the point. The sometimes bewildering complexity of environmental law can make simplification seem like an essential goal, and one might readily presume that some single regulatory instrument—perhaps an existing tool, perhaps something new—should predominate.⁴⁸ However, the critical habitat experience illustrates that regulators often need a variety of tools, and that, subject to some statutory guidance, they can and will use that variety in creative and effective ways. Therefore, environmental law's cacophony of regulatory instruments holds value, and the best option for addressing major environmental challenges will not be some dazzling new innovation, but rather will be a complex, label-defying combination of existing approaches.

Part I of this Article explains how the ESA protects critical habitat and how those provisions fit within the larger statutory scheme. Part II explains the methodology I used to assess how the services implement those provisions in practice. Part III sets forth the results, exploring both the discrepancy between statutory mandates and actual practice and the

45. See *infra* Section IV.B.

46. This question was famously addressed by the Supreme Court in *Massachusetts v. EPA*, which noted that agencies “whittle away” at massive problems. 549 U.S. 497, 524 (2007). But that observation begs the question, answered by neither the majority nor the dissent, of how one determines when the cut is so small as to be unworth the whittler's effort.

47. See *infra* Part V.

48. See, e.g., Mary Christina Wood, *Advancing the Sovereign Trust of Government to Safeguard the Environment for Present and Future Generations (Part I): Ecological Realism and the Need for a Paradigm Shift*, 39 ENVTL. L. 43, 56–57 (2009) (citing “a regulatory complexity that is mind-boggling” as a primary reason for environmental law's alleged failure).

alternative ways in which the services are providing habitat protection. Part IV considers the implications of those results for traditional views of the ESA and concludes that the results undermine two of the predominant narratives of ESA implementation. Part V explains how the services' regulatory approaches could be improved. It also reflects more broadly on this study's lessons for regulatory efforts to address the challenges of incremental environmental degradation.

I. THE STATUTORY REQUIREMENTS

The ESA is the most important U.S. law protecting biodiversity. The Act is designed to prevent the extinction of imperiled animal and plant species and to promote those species' recovery.⁴⁹ To those ends, it requires the services to list species that are in danger of extinction⁵⁰ and to designate critical habitat for those species.⁵¹ It then provides listed species and their habitat with a series of regulatory protections.⁵²

The ESA's focus on habitat is no coincidence. For decades, scientists have been warning that habitat loss is the single most important threat to biodiversity,⁵³ and Congress was well aware of this threat when it enacted the statute.⁵⁴ The challenge has only grown in recent years, with climate change now adding to a host of preexisting stressors.⁵⁵ Some predictions of the combined impacts of these stressors are staggering. A 2004 study published in *Nature*, for example, predicted that with the added stress caused by climate change, 15% to 37% of all global species could be committed to extinction by 2050.⁵⁶

This Part explains the ESA's habitat protection provisions. It begins with critical habitat, then discusses other key provisions that are partially (though not exclusively) focused on habitat protection, and

49. See 16 U.S.C. § 1531(b) (2006) (defining "conservation" of species as the core statutory goal); *id.* § 1532(3) (defining "conservation" in terms of recovery (internal quotation marks omitted)).

50. See *id.* § 1533(a).

51. *Id.* § 1533(a)(3).

52. See *id.* § 1533(d).

53. See, e.g., David S. Wilcove et al., *Quantifying Threats to Imperiled Species in the United States*, 48 *BIOSCIENCE* 607, 609 (1998).

54. See Amy Sinden, *The Economics of Endangered Species: Why Less Is More in the Economic Analysis of Critical Habitat Designations*, 28 *HARV. ENVTL. L. REV.* 129, 143 & n.65 (2004).

55. See Intergovernmental Panel on Climate Change, *Summary for Policymakers*, in *CLIMATE CHANGE 2007: IMPACTS, ADAPTION AND VULNERABILITY: CONTRIBUTION OF WORKING GROUP II TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE* 7, 11 (2007) [hereinafter IPCC]; J.B. Ruhl, *Climate Change and the Endangered Species Act: Building Bridges to the No-Analog Future*, 88 *B.U. L. REV.* 1, 3–4 (2008) (describing the role that climate change has played in reducing the pika's natural habitat).

56. Chris D. Thomas et al., *Extinction Risk from Climate Change*, 427 *NATURE* 145, 145 (2004); see also IPCC, *supra* note 55, at 11 ("Approximately 20–30% of plant and animal species assessed so far are likely to be at increased risk of extinction if increases in global average temperature exceed 1.5–2.5°C.").

then explains how—on paper, at least—the different provisions seem to interact.

A. *The Critical Habitat Requirements*

1. Definitions and Designation Procedures

Critical habitat is a crucial portion of the historic habitat of a threatened or endangered species. ESA section 3 defines the term “critical habitat” as including both occupied and unoccupied habitat with “physical or biological features . . . essential to the conservation of the species.”⁵⁷ The statute sets some limits on the breadth of the designation, and critical habitat cannot include the entire historic range of the species.⁵⁸ The services also may invoke economic costs to exclude some areas from the designation.⁵⁹ But if habitat is necessary for the species’ survival or recovery, it should be included.⁶⁰

In almost all circumstances, that habitat should be designated whenever the services determine that a species is threatened or endangered. Under ESA section 4, the services, “to the maximum extent prudent and determinable[,] . . . shall . . . designate” critical habitat and “may, from time-to-time thereafter as appropriate, revise such designation.”⁶¹ For years, the services observed that mandate largely in the breach.⁶² But judicial decisions have consistently compelled designations,⁶³ and the services are slowly catching up.⁶⁴ Over 600 species now have designated critical habitat, and the percentage of species with designated habitat is gradually rising.⁶⁵

In practice, the designations generally delineate particular geographic areas, though they may also describe certain landscape

57. 16 U.S.C. § 1532(5). The ESA defines “conservation” in terms of recovery, and critical habitat therefore is habitat with features that make it essential to species’ survival or recovery. *See id.* § 1532(3).

58. *See id.* § 1532(5)(C).

59. *Id.* § 1533(b)(2).

60. *Id.*

61. *Id.* § 1533(a)(3). In an approach that departs from much of the rest of the ESA, the services must consider economic impact when designating critical habitat. *Id.* § 1533(b)(2).

62. *See Sinden, supra* note 54, at 157–59.

63. *See Gifford Pinchot Task Force v. U.S. Fish & Wildlife Serv.*, 378 F.3d 1059, 1069–71 (9th Cir. 2004); *N.M. Cattle Growers Ass’n v. U.S. Fish & Wildlife Serv.*, 248 F.3d 1277, 1283 & n.2 (10th Cir. 2001); *Sierra Club v. U.S. Fish & Wildlife Serv.*, 245 F.3d 434, 441–42 (5th Cir. 2001).

64. *See Sinden, supra* note 54, at 159.

65. For a list of species with designated critical habitat, see *Listed Species with Critical Habitat*, U.S. FISH & WILDLIFE SERV., http://ecos.fws.gov/tess_public/CriticalHabitat.do?nmfs=1 (last visited Nov. 16, 2011). A full list of protected species is available at *Endangered Species Program*, U.S. FISH & WILDLIFE SERV., <http://www.fws.gov/endangered/species/us-species.html> (last visited Nov. 16, 2011). As of July 11, 2011, 607 of the 1,372 listed U.S. species have designated critical habitat. *Strengthening the Listing Program Work Plan: Questions and Answers*, U.S. FISH & WILDLIFE SERV., <http://www.fws.gov/home/feature/2011/pdf/FWSStrengthensWorkPlanAgreementFAQs.pdf> (last visited Nov. 16, 2011).

features that lead to inclusion in or exclusion from the designated area.⁶⁶ The services have designated millions of acres of habitat, and in some parts of the country, swaths of critical habitat cover much of the map.⁶⁷

2. Procedural and Substantive Protections

ESA section 7 protects those millions of acres of critical habitat.⁶⁸ Substantively, section 7 limits the ability of federal agencies to undertake, fund, or permit actions that degrade critical habitat. It directs agencies to “insure that any action authorized, funded, or carried out by such agency . . . is not likely to . . . result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical.”⁶⁹ In practice, this provision is often simply referred to as the “adverse modification prohibition.”

Procedurally, section 7 requires federal agencies taking actions (“action agencies,” in ESA terminology) that might adversely affect listed species to consult with the relevant service⁷⁰ and obtain a written report known as a “biological opinion.”⁷¹ A biological opinion expresses the service’s opinion about whether the project will “jeopardize” the survival of listed species (a concept explained in more detail below) or will result in adverse modification.⁷² If the service concludes that adverse modification is likely to result, the biological opinion should identify “reasonable and prudent alternatives” that could be implemented without causing adverse modification or jeopardy.⁷³ Once the action agency has received a biological opinion, it theoretically has the discretion to follow or to disregard the opinion’s recommendations.⁷⁴ In practice, however, action agencies rarely proceed with an action that the services predict will cause adverse modification or jeopardy.⁷⁵

66. See, e.g., Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Polar Bear (*Ursus maritimus*) in the United States, 75 Fed. Reg. 76,086, 76,119 (Dec. 7, 2010) (to be codified at 50 C.F.R. pt. 17) (excluding “manmade structures on all types of land ownership”).

67. See *FWS Critical Habitat for Threatened & Endangered Species*, U.S. FISH & WILDLIFE SERV., <http://crithab.fws.gov> (last visited Nov. 16, 2011) [hereinafter *Critical Habitat*]. The link accesses an online mapping tool. Total figures are hard to find, but the critical habitat for polar bears alone encompasses 187,157 square miles. *Polar Bear Critical Habitat: Some Frequently Asked Questions*, U.S. FISH & WILDLIFE SERV., http://alaska.fws.gov/fisheries/mmm/polarbear/pdf/critical_habitat_factsheet_11_2010.pdf (last visited Nov. 16, 2011).

68. 16 U.S.C. § 1536 (2006).

69. *Id.* § 1536(a)(2).

70. With some exceptions, NMFS holds jurisdiction over marine and anadromous fish species, and FWS holds jurisdiction over terrestrial and freshwater species.

71. 16 U.S.C. § 1536(b).

72. *Id.* § 1536(a)(2).

73. *Id.* § 1536(b)(4).

74. 50 C.F.R. § 402.15(a) (2010).

75. See *Bennett v. Spear*, 520 U.S. 154, 170 (1997).

This “formal consultation” process is usually preceded by and often intertwined with a more informal process in which the action agency and the services negotiate changes to the project.⁷⁶ Those discussions can result in a variety of outcomes. The services often concur that a project will not adversely affect listed species or their critical habitat, in which case the project may simply proceed.⁷⁷ Conversely, the action agency might decide that the impact on the species will be too great and unavoidable and therefore might abandon the project.⁷⁸ It might also significantly modify the project. Those changes can result in a new project description or in the inclusion in the biological opinion of “conservation measures,” which are binding conditions that the action agency must implement for the opinion to remain valid.⁷⁹ The services might also determine that a project will not lead to jeopardy or adverse modification but may nevertheless find that it will “take” listed species.⁸⁰ The services will then usually impose conditions—known as “reasonable and prudent measures” (RPMs)—designed to reduce the level of take.⁸¹ Finally, the biological opinion may also include “conservation recommendations,” which are nonbinding measures that would minimize harm to species or promote their recovery.⁸² The jumble of terms is bewildering, but essentially, there are many ways that consultation can change a project and minimize its negative impacts on habitat.

Every year, thousands of actions are subject to this consultation process. Section 7 applies only to federal agencies, and therefore purely state, local, and private actions do not require consultation.⁸³ But many of the governmental and private actions that affect species’ habitat require federal funding or permits,⁸⁴ and the federal government itself also carries out hundreds of species-affecting projects every year.⁸⁵

B. *The Jeopardy Prohibition*

In addition to its adverse modification prohibition, section 7 also precludes federal agencies from performing actions “likely to jeopardize the continued existence of any [listed] species”⁸⁶ This prohibition

76. U.S. FISH & WILDLIFE SERV. & NAT’L MARINE FISHERIES SERV., ENDANGERED SPECIES CONSULTATION HANDBOOK 3-1 (1998) [hereinafter CONSULTATION HANDBOOK].

77. *Id.*

78. *Id.* at 3-1, 3-3.

79. *See id.* at 4-19.

80. *Id.* at 4-48. For discussion of the ESA’s “take” prohibition, see *infra* Section I.C.

81. *See* 16 U.S.C. § 1536(b)(4) (2006); CONSULTATION HANDBOOK, *supra* note 76, at 4-52 to -54.

82. *See* CONSULTATION HANDBOOK, *supra* note 76, at xii.

83. 16 U.S.C. § 1536(a)(2) (2006) (imposing obligations on “[e]ach federal agency”).

84. For example, many development projects require dredge-and-fill permits issued by the U.S. Army Corps of Engineers, and many transportation projects depend on federal funding.

85. *See infra* Section III.C (discussing the large number of consultations for fish species alone).

86. 16 U.S.C. § 1536(a)(2).

is implemented through the same consultation process, and biological opinions always state whether or not the project is likely to cause jeopardy.⁸⁷ The jeopardy analysis should encompass any threat a project poses to listed species, including but not limited to habitat degradation.⁸⁸ In practice, most jeopardy analyses include extensive discussion of the action's potential habitat effects.⁸⁹

The jeopardy prohibition has received much more attention than the prohibition on adverse modification. Some academic analyses of ESA section 7 focus entirely on jeopardy;⁹⁰ practicing attorneys often refer to section 7 only as “the jeopardy prohibition,” as if the adverse modification prohibition does not exist; and, as discussed in more detail below, the services have often asserted that the jeopardy prohibition obviates the need for regulatory protection of critical habitat.⁹¹

C. The Take Prohibition

The ESA's other major substantive prohibition comes from section 9, which makes it unlawful for “any person” to “take” any endangered species.⁹² The Act defines “take” broadly. In addition to actions like hunting animals, the definition includes actions that “harm” listed species,⁹³ and the Supreme Court has upheld agency regulations that treat some forms of habitat modification as prohibited “takes.”⁹⁴ Consequently, as with the jeopardy prohibition, a key part of the take prohibition's role is to protect habitat.

Though far-reaching, the take prohibition is not absolute. Private parties may obtain incidental take permits if they prepare “habitat conservation plans” that meet the requirements of ESA section 10.⁹⁵ Those habitat conservation plans generally include measures to minimize and compensate for the expected take.⁹⁶ Federal agencies (and recipients of permits or funding from federal agencies) may also obtain “incidental take authorization” if they complete the section 7

87. CONSULTATION HANDBOOK, *supra* note 76, at 4-33 to -34.

88. *See id.* at 4-23 to -43 (describing the scope of the project impacts analysis).

89. With the exception of biological opinions for ocean fishing activities, the jeopardy analysis in every biological opinion that I reviewed included discussion of habitat impacts.

90. *See generally* Ruhl, *supra* note 55, at 42–49 (focusing on jeopardy while analyzing Section 7's role in responding to climate change).

91. *See* Barton H. Thompson, Jr., *People or Prairie Chickens: The Uncertain Search for Optimal Biodiversity*, 51 STAN. L. REV. 1127, 1141 (1999) (“[C]ritical habitat plays only a secondary role”); *infra* notes 117–121 and accompanying text.

92. 16 U.S.C. § 1538(a)(1) (2006). By regulation, the services have extended these protections to many threatened species. *Id.*

93. *Id.* § 1532(19).

94. *Babbitt v. Sweet Home Chapter of Cmty. for a Great Or.*, 515 U.S. 687, 704–06 (1995).

95. 16 U.S.C. § 1539; *see also* J.B. Ruhl, *How to Kill Endangered Species, Legally: The Nuts and Bolts of Endangered Species Act “HCP” Permits for Real Estate Development*, 5 ENVTL. L. 345, 345 (1999).

96. *See* 16 U.S.C. § 1539(a)(2)(A)(ii).

consultation process and implement the “reasonable and prudent measures” specified in the biological opinion.⁹⁷ But even with those potential exceptions, the take prohibition is generally viewed as a key part of the substantive core of the ESA.⁹⁸

D. *The Combination of Approaches*

Within this suite of protections, the adverse modification prohibition occupies an interesting—and hotly debated—niche. Without question, its protections are partly redundant because the jeopardy prohibition, the take prohibition, or both will preclude some habitat modification. For many years, the official position of the services was that the adverse modification protections were completely redundant, a position with which some commentators concurred.⁹⁹ But the plain language of the statute indicates, and some other commentators and courts have agreed, that the critical habitat provisions are not entirely redundant.¹⁰⁰ For many federal agency actions, they should hold independent significance.¹⁰¹

The potential for overlap is obvious. If a federal agency action is likely to cause major negative impacts to listed species, the jeopardy prohibition should apply, and the critical habitat provisions will simply offer an overlapping layer of protection. The controversy at issue in *Tennessee Valley Authority v. Hill*, the Supreme Court’s seminal ESA case, provides a good example.¹⁰² There, the Tennessee Valley Authority (TVA) proposed to operate a dam expected to obliterate all known habitat (including all designated critical habitat) of the snail darter, a listed species.¹⁰³ Such an action was clearly likely to cause both adverse modification and jeopardy. Similarly, if an action will lead to clear and discernible impacts to identifiable animals, the take prohibition should apply,¹⁰⁴ and the critical habitat protections again offer a redundant layer of protection. The *Hill* case provides an example here, as well; the killing of all known members of a species would clearly constitute a prohibited set of takes.¹⁰⁵ Nevertheless, there would appear, at least on paper, to be circumstances in which the adverse modification prohibition would apply but the jeopardy and take

97. *Id.* § 1536(b)(4).

98. See ZYGMUNT J.B. PLATER ET AL., ENVIRONMENTAL LAW AND POLICY: NATURE, LAW, AND SOCIETY 428 (4th ed. 2010).

99. See *supra* note 27 and accompanying text.

100. See *infra* notes 107–16 and accompanying text.

101. See *id.*

102. 437 U.S. 153 (1978).

103. *Id.* at 157, 158–64. The dam eventually was built, and “[t]o everyone’s surprise, the snail darter did not go extinct.” Holly Doremus, *The Story of TVA v. Hill: A Narrow Escape for a Broad New Law*, in ENVIRONMENTAL LAW STORIES 109, 134 (Richard J. Lazarus & Oliver A. Houck eds., 2005).

104. See *supra* notes 91–92 and accompanying text.

105. *Hill*, 437 U.S. at 173–74.

prohibitions would not.¹⁰⁶

1. Adverse Modification and Jeopardy

The adverse modification prohibition appears to go beyond the jeopardy prohibition in two categories of actions.¹⁰⁷ First, some federal actions may adversely modify habitat but not cause enough harm to create a likelihood of jeopardy. The services have consistently asserted that even after a species has been listed, it is generally possible to cause additional harm to the species without pushing it over the brink into jeopardy.¹⁰⁸ At least in some circumstances, this is a plausible statutory interpretation.¹⁰⁹ The adverse modification prohibition, by contrast, is more absolute. The statute does not define the phrase, but its meaning should be clear. “Adverse” means “against,” “hostile,” or “contrary to,”¹¹⁰ and “modification” means “[a] change to something.”¹¹¹ No size modifiers accompany the phrase “adverse modification.” The ESA does not use “major,” “significant,” or any other analogous phrase, despite those words’ prominent appearances in other contemporaneously drafted environmental laws.¹¹² The statute’s plain language therefore precludes federal agency actions from causing negative changes to critical habitat, even if the change is small.¹¹³

106. *But see infra* Part III (discussing the services’ apparent determination that these circumstances do not actually exist).

107. For a parallel analysis of the relationship between jeopardy and adverse modification, see Houck, *supra* note 24, at 300–01.

108. See CONSULTATION HANDBOOK, *supra* note 76, at 4-36 (explaining that not all adverse effects will rise to the level of causing jeopardy); Daniel J. Rohlf, *Jeopardy Under the Endangered Species Act: Playing a Game Protected Species Can’t Win*, 41 WASHBURN L.J. 114, 141–42 (2001) (describing the services’ willingness to allocate the “cushion” of tolerable harm).

109. If a species’ population is stable or improving, it could absorb some harm from individual actions without jeopardizing its existence. If habitat conditions are generally declining, and the individual project is contributing to that cumulative trend, a jeopardy finding seems less appropriate. But unlike the Council on Environmental Quality, which in its National Environmental Policy Act regulations has clearly required federal agencies to address such cumulative impacts, the services have been ambivalent at best about adopting a cumulative impacts approach to jeopardy findings. See 40 C.F.R. § 1508.27(b)(7) (2010) (distinguishing between those actions that create environmental impacts that are “individually insignificant but cumulatively significant”); Rohlf, *supra* note 108, at 137–43 (discussing the services’ shifting approaches to cumulative impact analyses).

110. BLACK’S LAW DICTIONARY 58 (8th ed. 2004) (“1. Against; opposed (to). 2. Having an opposing or contrary interest, concern, or position. 3. Contrary (to) or in opposition (to). 4. HOSTILE.”).

111. *Id.* at 1025 (“1. A change to something; an alteration 2. A qualification or limitation of something”).

112. See, e.g., 42 U.S.C. § 4332(2)(C) (2006) (requiring environmental impact statements for “major [f]ederal actions significantly” impacting the environment).

113. See Rodgers, *supra* note 7, at 170 (“Backing the tractor over a single salmon redd is an actionable deed of ‘destruction’ or ‘modification’ if the necessary paperwork is done.”).

Second, some federal actions will adversely modify habitat but will have uncertain impacts upon species' survival. Uncertainty pervades implementation of the ESA.¹¹⁴ The services do not always know the extent to which a proposed action will affect a species' viability. They are also often uncertain about species' status and population trends.¹¹⁵ Consequently, determining whether an individual project might pose enough risk to create jeopardy can be quite difficult.¹¹⁶ Yet the services may still know that the action will adversely affect the species' habitat. For example, determining whether a single clearcut in spotted owl critical habitat will tip spotted owls into a state of jeopardy may be very difficult, but discerning whether the clearcut will have adverse impacts on critical habitat ought to be much easier.

The fact that these interpretations are compelled by statutory language does not mean that they have been adopted by the services. In joint regulations promulgated in the 1980s, the services defined "adverse modification" not as any adverse change to designated critical habitat, but instead as "a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species."¹¹⁷ That definition, as numerous commentators and judicial opinions have pointed out, narrows the definition of adverse modification and gives the green light to actions that might limit recovery without appreciably reducing the species' odds of survival.¹¹⁸ In their joint consultation handbook, the services narrowed that regulatory definition a step further. "Modification or destruction of designated critical habitat that does not reach" the "appreciable" threshold, they claimed, should not count as adverse modification, and "is not prohibited by section 7."¹¹⁹ The agencies also defined the phrase "appreciably diminish" to mean "considerably reduce."¹²⁰ All of these words contain a somewhat deliberate vagueness, but the services apparently intended to create an exception for small-scale modification or destruction of habitat—an exception that appears nowhere in the text of the statute itself. On the basis of these definitions, the agencies then asserted, and some commentators agreed, that the

114. See COMM. ON SCIENTIFIC ISSUES IN THE ENDANGERED SPECIES ACT ET AL., SCIENCE AND THE ENDANGERED SPECIES ACT 148–54 (1995); Holly Doremus, *The Purposes, Effects, and Future of the Endangered Species Act's Best Available Science Mandate*, 34 ENVTL. L. 397, 438 (2004) ("Uncertainty is endemic in the ESA context.").

115. See Teresa Woods & Steve Morey, *Uncertainty and the Endangered Species Act*, 83 IND. L.J. 529, 531–33 (2008).

116. The statutory language does not require certainty as a predicate to a jeopardy finding; it instead prohibits actions "likely" to cause jeopardy. See 16 U.S.C. § 1536(a)(2) (2006). But as a practical matter, the services are probably much less likely to impose the constraints associated with a jeopardy finding in circumstances where they are highly uncertain about an action's future effects.

117. 50 C.F.R. § 402.02 (2010).

118. See, e.g., Houck, *supra* note 24, at 300–01; Sinden, *supra* note 54, at 153–57.

119. CONSULTATION HANDBOOK, *supra* note 76, at 4-35.

120. *Id.* at 4-36.

critical habitat protections were redundant.¹²¹

But the services' definitions no longer hold any legal force. Environmental groups repeatedly challenged the regulatory definition of adverse modification, arguing that it was inconsistent with the statute, and they repeatedly won.¹²² In December 2004, in response to these decisions, FWS directed its staff to ignore the regulations and rely on statutory text alone.¹²³ NMFS soon issued a similar memorandum.¹²⁴ The regulations have not been withdrawn or replaced, but the biological opinions of both services now consistently disclaim any reliance on the regulatory definitions.¹²⁵ The services therefore returned, at least in theory, to the statutory text, and that text gives the jeopardy and adverse modification prohibitions independent roles.

2. Take and Adverse Modification

The take prohibition also overlaps significantly, but not completely, with the ESA's prohibition on adverse modification. Many actions that modify habitat also directly take listed species. A timber sale or a dam project, for example, will have significant adverse impacts on habitat and is also likely to directly kill or harm members of species inhabiting the area. But, as the Supreme Court's *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon* decision illustrates, not every habitat modification will result in take.¹²⁶ Justice John Paul Stevens stressed in his majority opinion that the take prohibition applies only to actions that "actually kill[] or injure[] wildlife."¹²⁷ Justice Sandra Day O'Connor

121. See Endangered and Threatened Wildlife and Plants; Notice of Intent to Clarify the Role of Habitat in Endangered Species Conservation, 64 Fed. Reg. 31,871, 31,872 (June 14, 1999) (describing critical habitat protection as "an expensive regulatory process that duplicates the protection already provided by the jeopardy standard").

122. *Gifford Pinchot Task Force v. U.S. Fish & Wildlife Serv.*, 378 F.3d 1059, 1069–71 (9th Cir. 2004); *N.M. Cattle Growers Ass'n v. U.S. Fish & Wildlife Serv.*, 248 F.3d 1277, 1283 & n.2 (10th Cir. 2001); *Sierra Club v. U.S. Fish & Wildlife Serv.*, 245 F.3d 434, 441–42 (5th Cir. 2001).

123. Memorandum from Marshall Jones, Acting Director, Fish & Wildlife Serv., to Regional Directors, Regions 1, 2, 3, 4, 5, 6, and 7 & Manager, California-Nevada Operations Office (Dec. 9, 2004) [hereinafter Jones], available at <http://www.fws.gov/midwest/endangered/permits/hcp/pdf/AdverseModGuidance.pdf>.

124. Memorandum from William T. Hogarth, Ph.D., Director, to Regional Administrators, Office of Protected Resources (Nov. 7, 2005) [hereinafter Hogarth] (on file with author).

125. See, e.g., Memorandum from Field Supervisor, U.S. Fish & Wildlife Serv., N.M. Ecological Servs. Field Office, Albuquerque, N.M., to Dist. Ranger, Española Ranger Dist., Santa Fe Nat'l Forest, Española, N.M. (June 25, 2007) [hereinafter BUCKMAN DIVERSION BIOLOGICAL OPINION] (on file with author) ("This biological opinion does not rely on the regulatory definition of 'destruction or adverse modification' of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statute and the [*Gifford Pinchot Task Force* decision] . . .").

126. 515 U.S. 687 (1995).

127. *Id.* at 690, 700 n.13 (quoting the services' joint regulations) (internal quotation marks omitted).

elaborated on this point, stating that her concurrence was predicated on her understanding that “the challenged regulation is limited to significant habitat modification that causes actual, as opposed to hypothetical or speculative, death or injury to identifiable protected animals.”¹²⁸ In responding to Justice Antonin Scalia’s dissent, Justice O’Connor further delineated her understanding of the outer boundaries of the take prohibition.¹²⁹ Justice Scalia had raised the specter of section 9 applying to “a farmer who tills his field and causes erosion that makes silt run into a nearby river which depletes oxygen and thereby [injures] protected fish.”¹³⁰ Under any reasonable definition of the term, that farmer would be adversely modifying critical habitat if the river were so designated; his actions would cause a change, and that change would be for the worse.¹³¹ But according to Justice O’Connor, the farmer would not be causing a take, presumably because the causal chain between his action and harm to identifiable individual fish would be too attenuated or too difficult to discern.¹³²

Babbitt suggests two categories of actions that would trigger the adverse modification prohibition but would not be prohibited as takes.¹³³ First, actions that adversely affect currently unoccupied habitat are highly unlikely to cause a take but could qualify as prohibited adverse modifications. Second, actions that adversely affect habitat but have uncertain causal connections to harm to identifiable animals could fall solely under the adverse modification prohibition. In all likelihood, the latter class of actions, and perhaps also the former, would also fail to trigger the jeopardy prohibition, and the adverse modification prohibition alone would provide protection.

128. *Id.* at 708–09 (O’Connor, J., concurring). Justice O’Connor was not the deciding vote in the case, so her concurrence has no precedential authority, but it does suggest how other courts might interpret the boundaries of the take prohibition.

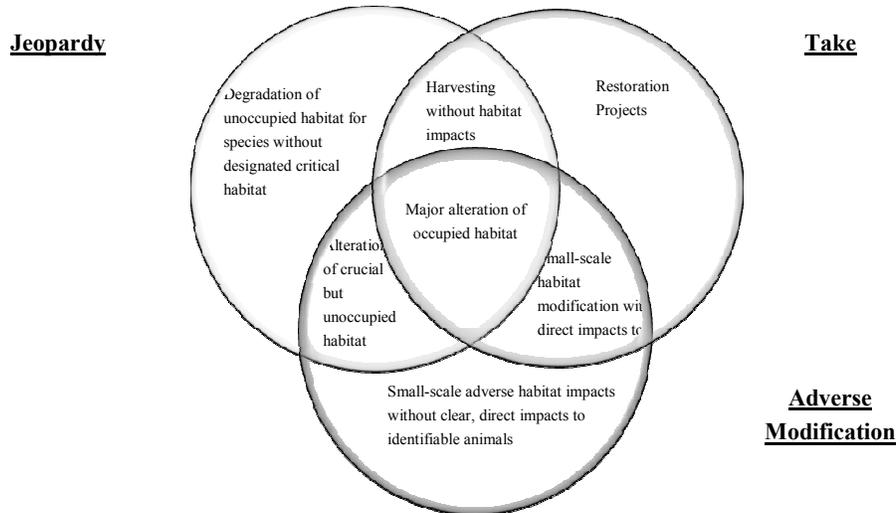
129. *Id.* at 710.

130. *Id.* at 719 (Scalia, J., dissenting).

131. *Id.* Such adverse modification would not be prohibited, however, unless the farmer needed a federal permit or funding for his actions.

132. *Babbitt*, 515 U.S. at 713 (O’Connor, J., concurring).

133. *See* *Ariz. Cattle Growers’ Ass’n v. U.S. Fish & Wildlife Serv.*, 273 F.3d 1229, 1238 (9th Cir. 2001) (“[M]ere habitat degradation is not always sufficient to equal harm.”) (citing *Nat’l Wildlife Fed’n v. Burlington N. R.R.*, 23 F.3d 1508, 1512–13 (9th Cir. 1994)).

Figure 1: The ESA's Prohibitions¹³⁴

At first blush, these categories of actions to which the adverse modification provision alone applies might seem trivial.¹³⁵ In actuality, they are probably enormous.¹³⁶ Two examples illustrate their potential scope.

The first is climate change. Scientists know that every action that increases greenhouse gas emissions contributes to climate change¹³⁷ and they know that climate change is a primary threat to polar bear habitat (and habitat for thousands of other species).¹³⁸ However, they cannot possibly determine which coal-fired power plant will kill which individual bears or quantify the increment of harm that a new plant will

134. This diagram shows examples of types of actions to which each of the ESA's regulatory prohibitions would apply. It also illustrates areas of potential overlap and, based on the plain language of the statute, unique application of each prohibition.

135. See, e.g., Thompson, Jr., *supra* note 91, at 1141 (explaining why the critical habitat provisions rarely assume independent significance).

136. See generally Odum, *supra* note 10, at 728 ("Each threatened and endangered species, with a few exceptions, owes its special status to a series of small decisions.")

137. Carbon dioxide and several other major greenhouse gases are long-lasting and well-mixed, which means that global emissions necessarily become blended together. See INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS: SUMMARY FOR POLICYMAKERS 2, 5, 15–16 (2007) [hereinafter INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE]. The extent of climate change therefore is largely a function of global aggregate emissions, and any emissions that add to that aggregate level influence the extent of change. *Id.*

138. See Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Polar Bear (*Ursus maritimus*) Throughout Its Range, 73 Fed. Reg. 28,212, 28,212, 28,292–93 (May 15, 2008) (to be codified at 50 C.F.R. pt. 17); INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* note 137, at 12 (summarizing threats to species generally).

cause.¹³⁹ All global emissions become mixed, and one can no more explain which puffs of carbon dioxide will kill which bears than one can identify a particular vote that won a national election.¹⁴⁰ Scientists therefore know that greenhouse gas-emitting projects are adversely affecting critical habitat, but it is much harder to say that those projects are jeopardizing specific species or taking identifiable individual animals. Consequently, the critical habitat provisions alone would seem to apply to the many federal actions authorizing, permitting, or directly causing increases in greenhouse gas emissions.¹⁴¹

A second example involves the water quality impacts of urbanization. Many scientific studies have documented a negative causal relationship between urban development and water quality, particularly in small urban watersheds.¹⁴² The problem is caused not only by development adjacent to or in the waterway, but also by the increasing extent of impervious surfaces throughout the watershed, for every new development increases pollutant loading, alters flow patterns, and helps change the configuration of the stream.¹⁴³ Assigning a specific increment of stream degradation to one project is likely to be impossible, for stream health usually reflects the intertwined influence of many stressors,¹⁴⁴ and attributing jeopardy or a take to a particular development project would be quite difficult.¹⁴⁵ But scientists can say with confidence that each new road, mall, or subdivision degrades aquatic habitat.¹⁴⁶ If that habitat is designated as critical—and in some parts of the country, thousands of stream miles in urbanizing areas are so designated¹⁴⁷—the adverse modification prohibition should apply.

139. See Memorandum from Office of the Solicitor, U.S. Dept. of Interior, to Director, U.S. Dept. of Interior (Oct. 3, 2008), *available at* http://www.peer.org/docs/doi/08_14_10_interior_solicitor_memo.pdf (arguing that drawing such causal linkages is impossible). The memo goes beyond just discussing jeopardy and take, and also argues that drawing a connection between any individual project and critical habitat degradation is impossible. *Id.* As the discussion above and below makes clear, I disagree with that conclusion.

140. See Ruhl, *supra* note 55, at 23.

141. Of course, the other provisions could still apply if those projects had other impacts on listed species. Constructing a coal-fired power plant, for example, might also harm species occupying the area where the plant would be built.

142. See Dave Owen, *Urbanization, Water Quality, and the Regulated Landscape*, 82 U. COLO. L. REV. 431, 439–45 (2011) (summarizing this research).

143. See CTR. FOR WATERSHED PROT., *IMPACTS OF IMPERVIOUS COVER ON AQUATIC SYSTEMS* 55, 91 (2003); Christopher J. Walsh et al., *The Urban Stream Syndrome: Current Knowledge and the Search for a Cure*, 24 J. N. AM. BENTHOLOGICAL SOC'Y 706, 707–08 (2005).

144. See Owen, *supra* note 142, at 441–44, 452–53.

145. Of course, if a large project is planned for a small watershed, that determination might still be possible.

146. See COMM. ON REDUCING STORMWATER DISCHARGE CONTRIBUTIONS TO WATER POLLUTION ET AL., *URBAN STORMWATER MANAGEMENT IN THE UNITED STATES* 207 (2009) (“[T]here is a near-universal negative association between biological assemblages in streams and increasing urbanization.”).

147. See *Critical Habitat*, *supra* note 67 (showing designated habitat). Much of the

For some of the most extensive threats to species habitat, then, the adverse modification prohibition seems to be the ESA's primary answer. Indeed, because of this unique role and the pervasive challenges of incremental environmental degradation, this prohibition appears to be one of the most powerful and important levers in all of environmental law.

II. METHODOLOGY

While in theory the critical habitat provisions should be very important, practice and theory often diverge. To gain a better sense of how FWS and NMFS actually implement the critical habitat provision, I pursued a series of inquiries focusing on several of the key points at which the critical habitat protections might exert some effect.

One key decision point is the consulting service's determination about whether a project will cause adverse modification or jeopardy. To track those outcomes, I reviewed almost¹⁴⁸ all biological opinions prepared for threatened or endangered fish species between January 1, 2005 and December 31, 2009.¹⁴⁹ That group included 4,048 opinions.¹⁵⁰ For each opinion, I tracked the project type, action agency, species affected, jeopardy determination, adverse modification determination, whether critical habitat had been designated for the species, and, if critical habitat had been designated, whether the action area¹⁵¹ included designated critical habitat.¹⁵²

Because of the large pool of biological opinions, this initial review was necessarily limited to tracking a few specific parameters. To zero in on potential effects, I then looked more closely at three sets of biological opinions. The sets collectively contained 138 biological

designated habitat includes stream corridors in developing areas.

148. Some opinions were available online, and the rest I obtained through Freedom of Information Act requests. The Sacramento field office of the Fish and Wildlife Service was unable to locate nineteen biological opinions. Several field offices in FWS' Mountain/Prairie region chose to fill out a results table rather than directly providing documents. The results for those Mountain/Prairie region biological opinions are included in the study, but I have not seen the original documents. I also eliminated a few biological opinions for which the pdf files were incomplete.

149. I limited the inquiry to fish species in an attempt to narrow the number of biological opinions. The five-year period postdates the services' abandonment of the legally flawed regulatory definition of adverse modification. It also had the incidental benefit of including more electronically available documents.

150. NMFS issued 2,963 of the opinions and FWS issued 1,085. Many biological opinion documents address more than one species, and some of those documents find jeopardy or adverse modification for some species but not others. In determining this overall number, and in performing the calculations described below, I counted each species-specific opinion as an independent biological opinion. Thus, if a single document addressed one project's impacts on four different listed species, I counted that document as four biological opinions.

151. The services define the "action area" as the area affected by an action. CONSULTATION HANDBOOK, *supra* note 76, at x. It can be larger than the project footprint. *See id.* at 4-53.

152. The data tables are on file with the author and are available on request.

opinions. I began with coho salmon, a species with four separately listed “evolutionarily significant units.”¹⁵³ During the study period, three of those units had designated critical habitat and the fourth did not.¹⁵⁴ For each biological opinion, I recorded whether the services predicted a net positive, negative, or neutral or unclear impact on the species’ habitat;¹⁵⁵ whether NMFS anticipated take, and if so, whether habitat modification was a predicted cause of take; and whether NMFS found jeopardy or adverse modification. I also performed a qualitative review of the conditions NMFS imposed upon the projects.¹⁵⁶ I then completed similar comparisons for two other species sets: first, Rio Grande silvery minnow and Gila topminnow; and then all fish species under the jurisdiction of FWS’s Oregon field office.¹⁵⁷ The former two species, though handled by different FWS field offices, have similar biological needs and face similar threats, but the Rio Grande silvery minnow has designated critical habitat while the Gila topminnow does not.¹⁵⁸ The latter group includes species both with and without critical habitat, all of them addressed by one field office. My goal, again, was to assess

153. *See Coho Salmon* (Oncorhynchus kisutch), NW. REG’L OFFICE: NOAA’S NAT’L MARINE FISHERIES SERV., <http://www.nwr.noaa.gov/ESA-Salmon-Listings/Salmon-Populations/Coho/> (last visited Nov. 16, 2011). To avoid attributing to coho salmon protection measures that were designed primarily to benefit other species, I eliminated biological opinions that also included consultations on other listed species.

154. *Id.*

155. Some biological opinions expressed conclusions on this question, and in others the expected effect was obvious from the analysis. If the expected net effect was not obvious, I treated the aggregate effect as neutral or uncertain.

156. While reviewing the biological opinions, I tracked the number of RPMs imposed. *See supra* note 81 and accompanying text (explaining what an RPM is). But for several reasons, I decided these numbers were not meaningful. First, an RPM is just one of the many ways in which consultation can lead to changes in projects. *See supra* notes 73–82 and accompanying text. A small number of RPMs may simply indicate that other approaches were being used instead. Second, the number of RPMs may not correspond with their stringency. A single prohibition may sometimes be more protective than a large set of mitigation measures.

157. I selected Oregon because the state has several fish species with critical habitat and several without critical habitat.

158. *See Species Profile: Gila Topminnow (Poeciliopsis occidentalis)*, U.S. FISH & WILDLIFE SERV., <http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E00C> (last visited Sept. 20, 2011); *Species Profile: Rio Grande Silvery Minnow (Hybognathus amarus)*, U.S. FISH & WILDLIFE SERV., <http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E071#crithab> (last visited Sept. 20, 2011). Both species primarily inhabit backwater and sidechannel habitats within desert river systems, and both are threatened by dewatering of rivers, increasing pollution levels, and changes in river channel structure. *See* U.S. FISH & WILDLIFE SERV., PHX., ARI., BIOLOGICAL OPINION ON THE ONGOING GRAZING FOR THREE ALLOTMENTS ON THE TONTO NATIONAL FOREST 10 (2009) (on file with author) (describing Gila topminnow habitat needs and threats); U.S. FISH & WILDLIFE SERV., N.M. ECOLOGICAL SERVS., ALBUQUERQUE, N.M., BIOLOGICAL OPINION ON THE EFFECTS OF THE TIFFANY SEDIMENT PLUG REMOVAL 7–8, 11–12 (2005) [hereinafter TIFFANY SEDIMENT BIOLOGICAL OPINION] (describing Rio Grande silvery minnow habitat needs and threats to that habitat).

whether critical habitat designations correlated with any difference in the services' approaches to habitat protection.

Because all consultation processes occur in the shadow of judicial review, I reviewed all cases, both published and unpublished, available on LexisNexis and Westlaw that address the adverse modification prohibition.¹⁵⁹

Finally, because I suspected that the paper record would tell only a partial story, I also interviewed FWS and NMFS staff.¹⁶⁰ The interviewees were all biologists, most with some level of supervisory responsibility over biological opinion preparation. All were career staff rather than political appointees. All of the interviews were somewhat structured.¹⁶¹ I promised anonymity to all interviewees.

Because critical habitat is a rather controversial subject, a few words are in order about what I did not do. This study does not directly assess how action agencies and private landowners respond to critical habitat designations. I did ask agency staff about their perceptions of the reactions of regulated parties, but my focus was on the regulatory activities of the services and on review of those activities by the courts. This study therefore is not, and should not be interpreted as, a definitive study of the effects of critical habitat designations, though its results should assist anyone pursuing such an inquiry.

III. RESULTS: THE PROHIBITION IN PRACTICE

A. *Jeopardy and Adverse Modification Determinations*

The final product of a formal consultation process is a biological opinion, and the crux of a biological opinion is its determination of whether the proposed action is likely to adversely modify critical habitat or to jeopardize listed species. Therefore, one key focus of my analysis was on the frequency of jeopardy and adverse modification determinations.

On this question, I was not exploring uncharted waters. While no past study has attempted to isolate the effect of critical habitat designations upon these outcomes, several have reviewed the frequency of jeopardy and adverse modification determinations.¹⁶² All of these studies have

159. See *infra* Section III.C (discussing twenty cases).

160. Most interviews were by telephone, but several biologists responded by e-mail. One biologist distributed the questions to all field offices in her region and then sent me a compilation of their answers, which we then discussed in a telephone call.

161. My standard questions appear in Table 3.

162. E.g., DAVID HOSKINS ET AL., FOR CONSERVING LISTED SPECIES, TALK IS CHEAPER THAN WE THINK: THE CONSULTATION PROCESS UNDER THE ENDANGERED SPECIES ACT ii (2d ed. 1994); U.S. GEN. ACCOUNTING OFFICE, ENDANGERED SPECIES ACT: TYPES AND NUMBER OF IMPLEMENTING ACTIONS 31–32 (1992) (“[O]ver 90 percent of the biological opinions issued by FWS/NMFS during the past 5 fiscal years have found that the proposed action would not likely place a listed species in jeopardy.”); U.S. GEN. ACCOUNTING OFFICE, ENDANGERED SPECIES: LIMITED EFFECT OF CONSULTATION REQUIREMENTS ON WESTERN WATER PROJECTS 11 (1987); Houck, *supra* note 24, at 319–20.

found that both jeopardy and adverse modification determinations are quite rare.¹⁶³ The primary reason is straightforward: the action agency and the consulting agency have many opportunities to revise the proposed action in order to avoid a jeopardy or adverse modification determination, and they usually take advantage of those opportunities.¹⁶⁴ Who accommodates whom in those negotiations is a more difficult question to answer. Some studies assert that the rarity of jeopardy or adverse modification decisions represents conflict avoidance primarily on the part of the services,¹⁶⁵ but there is also evidence that action agencies will go to great lengths to avoid a jeopardy determination.¹⁶⁶ Either way, the past studies demonstrate that some accommodation usually occurs.

Like the prior studies, I found that jeopardy and adverse modification determinations are rare. Within the set of biological opinions that I reviewed, FWS found jeopardy 7.2% of the time and adverse modification for 6.7% of eligible opinions.¹⁶⁷ Those numbers include the opinions of a Utah field office that, from 2005 through November 2008, issued jeopardy and adverse modifications with anomalous frequency. With the Utah opinions eliminated, the percentages are 2.4% and 0.67%. For NMFS, the percentages were lower: 0.54% for jeopardy and 0.64% for adverse modification. Interestingly, the percentages were different under the Bush and Obama Administrations. From January 20, 2009 through the end of that year, neither FWS nor NMFS issued a single jeopardy or adverse modification decision for any fish species.¹⁶⁸ While these results suggest subtle differences between agencies and administrations, the essential point is that jeopardy and adverse modification determinations were infrequent events for both agencies and under both administrations.¹⁶⁹

163. See *supra* note 149 and accompanying text.

164. See U.S. GEN. ACCOUNTING OFFICE, ENDANGERED SPECIES: MORE FEDERAL MANAGEMENT ATTENTION IS NEEDED TO IMPROVE THE CONSULTATION PROCESS 19–20 (2004) (describing measures taken by the agencies to increase collaboration and avoid conflict during consultation processes). One biologist told me that the services occasionally send draft jeopardy or adverse modification opinions to action agencies. Action agencies usually respond to these draft opinions by changing the project, removing the need for a jeopardy or adverse modification determination. Telephone Interview with NMFS Biologist (Nov. 16, 2010).

165. Houck, *supra* note 24, at 319–21.

166. See U.S. GEN. ACCOUNTING OFFICE, *supra* note 162, at 49–50 (“[A]ction agencies typically do quite a bit to avoid getting such an opinion.”).

167. The eligible opinions are opinions for those species that actually have designated critical habitat. The percentage therefore is the number of opinions finding adverse modification divided by the total number of opinions for species with designated critical habitat, whether or not the project at issue was in a critical habitat area.

168. I do not know why this difference exists. Possible explanations are that the Obama Administration has discouraged jeopardy and adverse modification opinions even more than the Bush Administration did, that the Obama Administration has encouraged action agencies to propose fewer harmful actions or to be more accommodating of proposed changes, that the Obama Administration is better at resolving interagency conflict, or that 2009 was an anomalous year for jeopardy and adverse modification findings.

169. The difference between the frequency of jeopardy and adverse modification findings

Table 1: Frequency of Jeopardy (J) and Adverse Modification (AM) Determinations¹⁷⁰

	NMFS (2962 opinions total)			FWS (1085 opinions total; 786 non-Utah opinions)		
	Total	Bush Admin.	Obama Admin.	Total	Bush Admin.	Obama Admin.
Frequency of J determinations	0.54%	0.66%	0%	7.2%	8.5%	0%
w/o Utah				2.4%	2.9%	0%
Frequency of AM determinations	0.64%	0.81%	0%	6.7%	8.2%	0%
w/o Utah				0.67%	1.0%	0%
# AM determinations w/o jeopardy	0	0	0	0	0	0
Jeopardy percentage for species w/o CH	0.13%	0.15%	0%	3.7%	4.1%	0%
w/o Utah				3.7%	4.1%	0%
Jeopardy percentage for species w/ CH	0.68%	0.87%	0%	7.9%	9.5%	0%
w/o Utah				3.2%	3.7%	0%

I also evaluated how frequently an adverse modification determination played an independent role in a negative biological opinion. As discussed above, the plain language of the statute suggests that the adverse modification prohibition would often have independent effect, for the set of federal actions that adversely affect habitat without clearly jeopardizing species would seem to be quite large.¹⁷¹ And following the *Gifford Pinchot Task Force* decision,¹⁷² the services have

under the Bush and Obama Administrations is significant at the 10% level but not at the 5% level. In other words, based on these data, one can reject with 90% but not 95% confidence the hypothesis that the Bush and Obama Administrations were equally likely to find jeopardy. E-mail from Rachel Bouvier, Ph.D, Dep't. of Econ., U. of S. Maine, to Dave Owen (Nov. 8, 2011, 8:16 PM) (on file with author) (summarizing Professor Rachel Bouvier's statistical analysis of these data). The differences between NMFS and FWS in their frequency of finding jeopardy and adverse modification are both significant at the 99% level. *Id.*

170. Throughout this table, I used the following short forms: Jeopardy (J); Adverse Modification (AM); Critical Habitat (CH). To calculate the overall frequency of jeopardy determinations, I divided the total number of jeopardy determinations by the total number of biological opinions. To calculate the frequency of jeopardy determinations for species with designated critical habitat, I divided the total number of jeopardy determinations for those species by the number of biological opinions for those species. To calculate the frequency of jeopardy determinations for species without critical habitat, I divided the number of jeopardy opinions for such species by the total number of biological opinions for such species. To calculate the frequency of adverse modification decisions, I divided the total number of adverse modification opinions by the total number of opinions for species with designated critical habitat. The data tables supporting these calculations are available on request from the author.

171. *See supra* notes 136–47 and accompanying text.

172. *Gifford Pinchot Task Force v. U.S. Fish & Wildlife Serv.*, 378 F.3d 1059, 1069–71

consistently claimed they are ignoring their regulatory definition of adverse modification—a definition that seemed to allow some incremental degradation—and focusing solely on the statutory language.¹⁷³ But my data set did not include a single opinion in which either NMFS or FWS found jeopardy without finding adverse modification. Instead, the agencies have treated the class of actions that adversely modifies habitat without also causing jeopardy as a null set.¹⁷⁴

One might hypothesize that perhaps the services were reluctant to let adverse modification findings stand on their own, and therefore added jeopardy determinations when they were already leaning toward adverse modification findings. There is some statistical evidence consistent with this hypothesis.¹⁷⁵ NMFS did find jeopardy more frequently for species with designated critical habitat, but the difference was not statistically significant.¹⁷⁶ In interviews, a few biologists thought such an effect was possible, whether that was because a critical habitat designation increased focus on habitat needs or because the opinions' authors were reluctant to try to explain an adverse modification finding without an accompanying jeopardy finding.¹⁷⁷ But other biologists expected no such effect, and neither the interviews nor the statistics suggest that the effect, if it does exist, is anything more than a subtle influence potentially changing a tiny percentage of outcomes.¹⁷⁸

Closer examination of the subsets of opinions confirmed that critical habitat designations had little effect on regulatory outcomes. In forty-four of the 138 opinions, the proposed action was expected to have net adverse effects on habitat.¹⁷⁹ Some of the anticipated habitat effects seemed substantial and others minor, but by at least one key measure, almost all were meaningful and discernable: in over 80% of these opinions, the consulting service determined that the habitat alteration would cause or

(9th Cir. 2004).

173. See *supra* notes 123–24 and accompanying text.

174. In discussions with FWS and NMFS biologists, this finding often came up, and no biologist ever told me I had missed an opinion. One did send me a 1996 opinion (outside of the study period) that found adverse modification without finding jeopardy. See NAT'L MARINE FISHERIES SERV. NW. REGION, ENDANGERED SPECIES ACT—SECTION 7 CONSULTATION BIOLOGICAL OPINION, YANTIS DITCH EASEMENT 20–22 (1996).

175. Critical habitat also may be designated more often for species in greater danger of extinction, and the increased frequency of jeopardy determinations might reflect the gravity of threats rather than an independent effect of critical habitat designations.

176. E-mail from Rachel Bouvier, Ph.D., Dep't. of Econ., U. of S. Maine, to Dave Owen (Nov. 11, 2011, 5:13 PM) (on file with author) (explaining her statistical analyses for these differences). For FWS, the frequency of jeopardy findings also was higher where critical habitat was designated, and the difference is statistically significant. *Id.* However, with the Utah opinions eliminated from the analysis, the jeopardy percentages are actually slightly higher for species *without* critical habitat. See *supra* Table 1.

177. See *infra* Table 3.

178. *Id.*

179. See *infra* Table 2. The data tables supporting these calculations are available upon request from the author.

contribute to “take” of the relevant listed species.¹⁸⁰ Yet not one of these opinions found that the project would cause jeopardy or adverse modification, and the presence or absence of a critical habitat designation had no apparent effect upon the outcome.

Table 2: Frequency of Jeopardy (J), Adverse Modification (AM), and Take Findings for Selected Subsets of Biological Opinions¹⁸¹

Species group	Total # opinions	Percent predicting positive (+), negative (-), neutral (=) / uncertain (?) habitat trends	J findings	AM findings	Percent finding “take” partly or entirely due to habitat modification (for opinions predicting negative habitat trend and for all opinions)	Percent imposing “reasonable and prudent measures”
Coho (CH)	47	32% + 36% - 32% ?	0	0	94% - 94% overall	96%
Coho (no CH)	13	46% + 23% - 31% =/?	0	0	100% - 77% overall	90%
Rio Grande silv. minnow (CH)	18	56% + 39% - 6% =/?	0	0	14% - 56% overall	100%
Gila topminnow (no CH)	9	44% + 22% - 33% =/?	0	0	100% - 89% overall	89%
Oregon (CH)	18	56% + 39% - 6% =/?	0	0	100% - 94% overall	100%
Oregon (no CH)	29	48% + 28% - 24% =/?	0	0	88% - 66% overall	90%
Oregon (mixed)	4	75% + 0% - 25% ?	0	0	NA 75% overall	100%
All non-CH opinions	51	47% + 25.5% - 27.5% =/?	0	0	92% - 73% overall	90%
All CH opinions	83	42% + 37% - 20% =/?	0	0	76% - 86% overall	98%
All mixed opinions	4	75% + 0% - 25% ?	0	0	NA 75% overall	100%
All opinions	138	45% + 32% - 23% =/?	0	0	80% 81% overall	96%

180. *Id.* I derived this figure by dividing the total number of opinions that anticipated a negative outcome for habitat, that predicted takes, and that attributed those takes at least partly to habitat alteration by the total number of opinions predicting negative habitat outcomes. Several of the remaining opinions were unclear about whether habitat modification would contribute to the take, and one was a programmatic study that deferred the take analysis to project-specific biological opinions.

181. The raw data supporting this table are available upon request from the author.

Nor could I discern any important difference in the method of analysis. Some differences do appear. Biological opinions for projects affecting critical habitat do always include paragraphs discussing those effects. In the pool of opinions I reviewed closely, they also always included a finding of no adverse modification. But jeopardy discussions also consistently addressed habitat, and the adverse modification analyses often seemed like derivative appendages to the jeopardy analyses. That appearance is entirely consistent with what one biologist described as a prevailing attitude toward these analyses: “[I]t’s like, ‘oh, we have to do the adverse mod’ . . . it’s just another thing we have to do.”¹⁸²

The opinions also indicate *why* the agencies were never finding adverse modification, even where projects clearly would adversely affect designated critical habitat and the effects were of sufficient scale to harm or even kill individual animals. Quite simply, the services do not construe the adverse modification prohibition as applying to minor alterations to habitat. And in the 138 opinions I closely reviewed, all negative alterations were described—sometimes convincingly, sometimes not¹⁸³—as minor. The biological opinions offered a variety of justifications for these conclusions, but all essentially amount to the

182. Telephone Interview with FWS Biologist (Dec. 21, 2010).

183. See, e.g., NAT’L MARINE FISHERIES SERV. NW. REGION, ENDANGERED SPECIES ACT—SECTION 7 CONSULTATION BIOLOGICAL OPINION & MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT CONSULTATION: TIDEWATER CONTRACTORS GRAVEL MINING, ROGUE RIVER ESTUARY 12–13 (2006) [hereinafter TIDEWATER BIOLOGICAL OPINION] (finding no adverse modification for a project that “will decrease habitat suitability and likely result in reduced use of these two acres of the river by coho salmon. The project will disrupt the normal behavior patterns of individuals that would use these areas, and will delay the recovery of the habitat characteristics important for high water refuge.”); NAT’L MARINE FISHERIES SERV. NW. REGION, ENDANGERED SPECIES ACT—SECTION 7 CONSULTATION BIOLOGICAL OPINION & MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT CONSULTATION: CURRY COUNTY ROADS DEPARTMENT AND RINGER GRAVEL MINING IN HUNTER CREEK 14–20 (2005) (finding no adverse modification despite concluding that a project would “alter approximately 2,450 feet of streambank . . . used by juvenile coho salmon as rearing habitat” and would result in “reduction in production of desirable macroinvertebrate species in 1,500 feet of stream and a reduction in desirable prey to rearing SONC coho salmon juveniles”); BUCKMAN DIVERSION BIOLOGICAL OPINION, *supra* note 125, at 42–43 (finding no adverse modification for a water project that would reduce flows in the Rio Grande). The opinion noted:

This reduction in flows contributes to an increased risk of river drying (either in timing of a drying event or the extent of that event). Even without a drying event, the reduction in flows affects the total wetted area, water depth, sediment transport, and structure of the aquatic habitats (pools, runs, riffles). Reduced water quality may also be a concern, particularly as there would be less water for dilution of waste water treatment plant (WWTP) inflows. Primary constituent elements of designated critical habitat are also adversely affected.

Id. at 33; see also *id.* at 33–43 (describing in detail the impacts, which the conclusion dismissed as “minimal”).

claim that the project would only affect a small portion of the species' critical habitat, and therefore, in the grand scheme of things, would not really matter.¹⁸⁴ Sometimes the biological opinions offered that rationale within a few paragraphs of a cumulative effects analysis acknowledging that the species' habitat was being degraded, and that the degradation was occurring through the incremental effects of small habitat alterations, but this apparent tension was never acknowledged.¹⁸⁵

The sets of biological opinions also contain a gap that, perhaps more tellingly than anything expressly stated, indicates the limited actual reach of the adverse modification prohibition. Part I of this Article explained that the adverse modification prohibition would appear on paper to be the ESA's primary mechanism for addressing federal actions increasing greenhouse gas emissions or accelerating the water quality impacts of urbanization.¹⁸⁶ A person well-versed in statutory requirements but somewhat naïve about practical realities therefore might expect to see many biological opinions addressing new greenhouse gas sources and new urban development.¹⁸⁷ But the former type of biological opinion does not appear in either data set. The latter type does, but far less frequently than one might expect. The services consult when projects will abut, intrude into, or cross rivers or streams inhabited by listed species, but development projects not directly

184. In general, the services asked whether the particular project's effects would be discernible on some regional scale. But they rarely considered whether the project, in combination with other similar projects, would have a discernible effect. *See, e.g.*, NAT'L MARINE FISHERIES SERV. NW. REGION, ENDANGERED SPECIES ACT—SECTION 7 CONSULTATION BIOLOGICAL OPINION & MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT CONSULTATION: BOERSMA GRAVEL PIT STABILIZATION 15 (2007) (finding no adverse modification for a project with negative habitat impacts that “will only affect less than 1% of the Applegate River in the Lower Applegate River 5th Field watershed”); U.S. FISH & WILDLIFE SERV., N.M. ECOLOGICAL SERVS. FIELD OFFICE, ALBUQUERQUE, N.M., BIOLOGICAL OPINION ON THE EFFECTS OF THE DRAIN UNIT 7 EXTENSION PRIORITY SITE PROJECT 20–21 (2007) [hereinafter DRAIN UNIT 7 BIOLOGICAL OPINION] (finding no adverse modification for a project with adverse habitat impacts “because the impacts will be temporary and occur in a very small area relative to the overall critical habitat designation”).

185. *See, e.g.*, DRAIN UNIT 7 BIOLOGICAL OPINION, *supra* note 184, at 21–22 (finding no adverse modification for a habitat-degrading project within a few paragraphs of noting that other activities “will continue to threaten the survival and recovery of the silvery minnow by reducing the quantity and quality of habitat through continuation and expansion of habitat degrading actions”); TIDEWATER BIOLOGICAL OPINION, *supra* note 183, at 16 (finding no adverse modification for a gravel mining project just after noting that “[a]s the human population in the action area continues to grow, demand for agricultural, commercial, or residential development, as well as gravel for roads and concrete, is also likely to grow. The effects of new development caused by that demand are likely to reduce the conservation value of the habitat within the action area.”).

186. *See supra* notes 136–47 and accompanying text.

187. Many development projects do not require federal funding or authorization and therefore would not be covered by section 7. But many development projects do require federal wetlands permits, and federal funding also supports a lot of road building, so the set of projects potentially subject to regulatory coverage still should be large.

adjacent to waterways rarely are subjected to formal consultation, notwithstanding the projects' widely understood impacts upon aquatic species' habitat.¹⁸⁸ Two major classes of activities collectively causing major habitat degradation therefore proceed with essentially no ESA-based regulation at all.

B. *Project Modifications*

While the jeopardy and adverse modification determinations might seem like the heart of the biological opinion, they are not the only important component. Indeed, because of the rarity of jeopardy and adverse modification determinations, the most important content probably lies elsewhere. In particular, even when a biological opinion determines that a project is not likely to adversely modify critical habitat or cause jeopardy, the opinion still will often contain a list of modifications of, and conditions for, proceeding with the project. I therefore also reviewed these modifying conditions, first to assess whether they seemed different when critical habitat was at issue, and second to assess what they revealed about the services' approaches to habitat protection.

1. The Prevalence of Take Findings and Conditions

As discussed in Part I, one might expect the critical habitat provisions to provide more habitat protection than the take provision. The take provision applies only when an action proximately causes harm to protected animals,¹⁸⁹ which seems to require a more complex showing of causation than would be necessary to demonstrate adverse modification to critical habitat. But even as the services routinely decline to find adverse modification, they almost always predict that proposed projects will cause take of listed species, which they usually find to be at least partly due to habitat modifications.¹⁹⁰ Of the subset of biological opinions I reviewed in detail, 96% anticipated take and 81% anticipated take through habitat modification.¹⁹¹ Of the opinions that anticipated negative aggregate effects on habitat, 84% found that habitat modifications would cause or contribute to takes.¹⁹² Even when the

188. The set of 138 closely reviewed opinions included no consultations addressing the impacts of impervious cover at locations removed from the waterways, even though the cumulative impacts discussion in some of those opinions—particularly those for coho salmon—routinely identified urbanization as a threat. *See, e.g.*, TIDEWATER BIOLOGICAL OPINION, *supra* note 183, at 16–17; *see also* Telephone Interview with FWS Biologists (Nov. 13, 2010) (noting that their office was not actively pursuing regulation of watershed development patterns).

189. *See supra* notes 126–31 and accompanying text (discussing the *Babbitt* decision).

190. *See supra* Table 2.

191. I derived these numbers by dividing the total number of opinions anticipating take by the total number of opinions, and then by dividing the total number anticipating take through habitat modification by the total number of opinions. The supporting data tables are available on request from the author.

192. *See supra* Table 2. The remaining seven opinions include one programmatic opinion,

services anticipated a net benefit to species—and quite often they did, for many of the consultations involved restoration projects—take findings were still routine.¹⁹³

The services almost always attempted to minimize the habitat degradation leading to take. In almost all of the opinions that anticipated take through habitat modification, the relevant service tried to limit that take by imposing “reasonable and prudent measure[s]” at least partially designed to protect habitat. They also imposed “conservation measures” to similar effect.¹⁹⁴ In addition to these measures, the services would often include “conservation recommendations,” which are non-binding suggestions for additional actions that could benefit listed species.¹⁹⁵ And while the biological opinions did not reveal these changes, biologists told me that the services routinely ask agencies to modify their project descriptions in ways designed to protect species.¹⁹⁶

The nature of those conditions varies. For some species—typically salmonids¹⁹⁷—the conditions are usually quite detailed, often running for several pages and containing highly specific instructions on everything from replanting native vegetation to staffing the project with trained biologists.¹⁹⁸ For other species, the conditions are much more general.¹⁹⁹ The conditions also varied in the extent to which they were tailored to specific sites. Some conditions were obviously created with one specific project in mind,²⁰⁰ but many reflected more generalized best management practices for the type of project and species at issue. Some of those practices appear to have evolved informally through a series of consultations on similar projects, while others were memorialized in programmatic consultations or written interagency

which left take findings to be made in subsequent project-specific biological opinions, and several opinions that did not clarify whether habitat modification was an anticipated cause of take.

193. *See supra* Table 2.

194. *See, e.g.*, TIFFANY SEDIMENT BIOLOGICAL OPINION, *supra* note 158, at 5, 27.

195. *See, e.g., id.* at 27.

196. *See, e.g.*, Telephone Interview with FWS Biologist (Dec. 21, 2010) (explaining that FWS’s “preference always is to get conservation up front”).

197. Salmonids include salmon and trout species. Collectively, they account for the majority of fish-related consultations.

198. *See, e.g.*, NAT’L MARINE FISHERIES SERV. NW. REGION, ENDANGERED SPECIES ACT—SECTION 7 CONSULTATION BIOLOGICAL OPINION & MAGNUSON-STEVENSON FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT CONSULTATION: EAST/WEST FORK ILLINOIS RIVER BRIDGE REPLACEMENTS PROJECT 28–37 (2005) (nine pages specifying RPMs and implementing conditions relating to coho salmon).

199. *See, e.g.*, BUCKMAN DIVERSION BIOLOGICAL OPINION, *supra* note 125, at 44–45 (specifying one RPM with one term and condition requiring the future development of a strategy to minimize project impacts).

200. *See, e.g.*, NAT’L MARINE FISHERIES SERV. NW. REGION, ENDANGERED SPECIES ACT—SECTION 7 CONSULTATION BIOLOGICAL OPINION & MAGNUSON-STEVENSON FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT CONSULTATION: MILLPORT SLOUGH BRIDGE, SILETZ RIVER 36 (2009) (providing detailed specifications for eelgrass restoration to compensate for habitat impacted by the project).

agreements.²⁰¹

Despite these variations, one common theme emerged: the services expected many of the conditions to provide significant benefits to the species.²⁰² Sometimes the benefits would simply reduce the adverse impacts of the project, but with many projects, the services anticipated that with the protective conditions in place, the project would actually benefit affected species.²⁰³ While a rigorous evaluation of the accuracy of those predictions is impossible without monitoring data and knowledge of the specific context of each project, most of the claims easily pass a straight-face test.²⁰⁴ Measures like replanting shade vegetation, re-engineering stream crossings to improve fish passage, isolating work areas, limiting work to seasons when listed fish species are less likely to be present, and requiring trained fish biologists to observe project implementation²⁰⁵ all seem likely to provide real benefits to species.²⁰⁶

2. The Slight (but Evolving) Importance of Critical Habitat

The preceding discussion clearly demonstrates that section 7 consultations lead to habitat protection. But I found little evidence that critical habitat designations make any difference in the level of protection.

In reviewing biological opinions, I found no difference in the approaches for species with critical habitat and species without critical

201. See, e.g., NAT'L MARINE FISHERIES SERV. NW. REGION, ENDANGERED SPECIES ACT—SECTION 7 CONSULTATION BIOLOGICAL OPINION & MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT CONSULTATION: SUCKER CREEK BRIDGE REPLACEMENT AND BANK STABILIZATION PROJECT 2 (2006) (describing conditions specified in an earlier programmatic biological opinion); Telephone Interview with NMFS Biologist (Nov. 16, 2010) (explaining that more than half of their consultations use standardized conditions and describing this as a “very fruitful way to go” because of administrative efficiencies and because action agencies were willing to accept highly protective conditions).

202. E.g., Telephone Interview with NMFS Biologist (Nov. 16, 2010) (describing some of the conditions as “pretty much bombproof”).

203. See, e.g., NAT'L MARINE FISHERIES SERV. NW. REGION, ENDANGERED SPECIES ACT—SECTION 7 CONSULTATION BIOLOGICAL OPINION & MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT CONSULTATION: FALL CREEK CULVERT AND BRIDGE PROJECT 1–2, 18–19 (2005) (presenting a biological opinion for a roadway project coupled with substantial efforts to improve fish passage).

204. For an exception to this generalization, see BUCKMAN DIVERSION BIOLOGICAL OPINION, *supra* note 125, at 44–45 (requiring the future development of measures to address the adverse impacts of the project); see also *Center for Biological Diversity v. Salazar*, No. CV 07–484 TUC–AWT, 2011 WL 2160254, *11–14 (D. Ariz. 2011) (describing, and rejecting as legally insufficient, reliance on uncertain mitigation measures).

205. See, e.g., *supra* note 203 at 2–5, 23–30 (describing these and many other measures).

206. The extent of the benefits is uncertain, however. See Lyman L. McDonald et al., *Monitoring and Evaluation: Salmon Restoration in the Columbia River Basin*, in *RETURN TO THE RIVER: RESTORING SALMON TO THE COLUMBIA RIVER* 571, 588 (Richard N. Williams ed., 2006) (noting uncertainties about restoration activities).

habitat. For both categories of species, the services allowed habitat-degrading projects to proceed; for both categories, they imposed conditions designed to reduce, but not always eliminate, the extent of habitat impacts; for both categories, they used conservation requirements and reasonable and prudent measures to adjust projects; and within both categories, the level of detail in the conditions varied. But a limited quantitative analysis reveals no clear trends,²⁰⁷ and qualitatively, the variations seem more closely related to species type and office location than to the critical habitat designation. Perhaps most tellingly, the biological opinions never mentioned protecting critical habitat as an independent justification for imposing conditions. My analysis does not prove that the conditions imposed for species with critical habitat and those imposed for species without critical habitat are the same, for there could be subtle distinctions that a primarily qualitative comparison would not pick up. But I found no affirmative evidence that the agencies were using distinct approaches.

The interviews nevertheless suggested that critical habitat designations have some subtle effects. Some, though not all, of the biologists believed that critical habitat designations slightly increased the likelihood that action agencies would engage in informal consultation prior to proceeding with projects.²⁰⁸ Some, though again not all, of the biologists thought that the process of designating critical habitat spurred the services to think more carefully about species' habitat needs and that the resulting additional knowledge could help them develop more protective conditions.²⁰⁹ Many of the biologists thought that a critical habitat designation gave the services more leverage to negotiate habitat conditions.²¹⁰ With one exception,²¹¹ none of the biologists thought the changes were large, and any assertion of major across-the-board effects would be difficult to reconcile with the biological opinions. But all of the biologists thought that subtle effects do exist.

207. See *supra* Table 2.

208. See *infra* Table 3 (summarizing responses); see, e.g., Telephone Interview with FWS Biologists (Nov. 3, 2010) (stating that informal consultations were now more likely to occur, particularly for projects in unoccupied habitat).

209. See *infra* Table 3 (summarizing responses); see, e.g., Telephone Interview with FWS Biologist (Nov. 4, 2010) (asserting that the designation process improves understanding of species needs). But see Telephone Interview with NMFS Biologist (Nov. 16, 2010) (asserting that he did not see this effect in his office).

210. See, e.g., E-mail from FWS Biologist to Dave Owen (Nov. 24, 2010, 12:13 PM) (on file with author) (“The CH designation helped bring everyone to the table and gave me better leverage to negotiate some significant avoidance measures.”).

211. See Telephone Interview with NMFS Biologist (Nov. 22, 2010) (stating that the designations gave her a “stronger arm going into negotiations . . . [and] it makes a really big difference”).

Table 3: Summary of Agency Biologist Responses²¹²

Question	Answers by the numbers	Representative answers
Do you think CH designations affect the frequency with which action agencies engage in informal consultations?	Yes: 2 Yes, slightly: 4 Possibly: 2 No: 7	- A few biologists thought designations sensitize action agencies to effects on habitat, leading to more consultations. - Several biologists perceived a change in the frequency of informal consultations for unoccupied habitat.
Do you think CH designations make projects more likely to proceed to formal consultation?	Yes: 2 Yes, slightly: 3 Possibly: 2 No: 8	- Several biologists mentioned consultations for unoccupied habitat. - One biologist who said “no” noted that she was starting to question that approach.
Do you think CH designations affect the choice of conservation measures?	Yes: 5 Maybe: 2 Occasionally: 3 No: 5	- People are “more willing to negotiate and mitigate.” - “It makes a really big difference.” - “Maybe, but not much.” - “In any section 7 consultation, we strive to protect the species and the ecosystem it depends upon.”
Do you think CH designations affect the choice of RPMs?	Yes: 1 Possibly, or Occasionally: 2 No: 11	- Many biologists asserted that RPMs should focus on mitigating take, not on independently protecting critical habitat. - Two biologists who said “no” thought that might change.
Do you think CH designations affect the choice of RPAs?	Yes: 3 It should: 1 Maybe: 1 No: 7 No experience: 3	- If an RPA came specifically out of an adverse modification determination, that would be a big deal.
Do you think CH designations increase the likelihood of jeopardy determinations?	Yes: 4 Maybe: 2 Hard to say: 1 No: 5 No experience: 3	- Some biologists thought designations increase focus on habitat, which could change the outcome of the jeopardy analysis. - Others argued that the jeopardy analysis was always focused on habitat and expected no change in outcomes.
Do you think CH designations affect outcomes in other ways?		<ul style="list-style-type: none"> • They focus attention on particularly important areas. • They help the services develop a better understanding of habitat needs. • They cause actors “to take the ESA a little more seriously.” • They create the inaccurate impression that nondesignated areas are unimportant. • “Critical habitat has proved to be useful in negotiating regional conservation strategies for section 10(a)(1)(B) permits.”
Have you seen a change over time in the ways in which CH designations affect implementation?		<ul style="list-style-type: none"> • Yes; it’s an “evolving concept.” • More internal scrutiny of adverse modification questions. • Greater willingness to designate unoccupied habitat. • Biologists are increasingly able to get project proponents to change projects; “it didn’t used to be that way.” • No, it’s still not that important in my region.

212. This table should be read with a few caveats in mind. First, I did not ask for specific “yes,” “no,” or “I don’t know” answers, and consequently, the categories for the “by the numbers” column reflect the range of answers I received. Second, comments that do not appear in quotes are paraphrased. Third, one regional office provided me an e-mail combining the responses of multiple biologists in several field offices, and I have treated that as a single response. In short, this is a sampling of views, not a formal survey.

C. Adverse Modification in the Courts

Consultation processes occasionally culminate in litigation, and the courts therefore help to determine the effect of the adverse modification prohibition. Judicial influence has been the focus of much of the previous legal literature on critical habitat,²¹³ and from those analyses, several hypotheses have emerged. Some commentators have argued that critical habitat designations are essentially inconsequential for judicial review,²¹⁴ while others have suggested that they add teeth to judicial review of no-jeopardy opinions.²¹⁵ Interestingly, most legal commentators agree that judicial review of the adverse modification prohibition has little significance except to the extent it bolsters the jeopardy review.²¹⁶ To test these hypotheses and to assess what effect judicial review might be creating, I also reviewed the body of case law addressing adverse modification.

The most striking quality of this body of case law is its small size. Academic and popular descriptions sometimes portray the consultation process as hopelessly embroiled in litigation,²¹⁷ a characterization that tracks a broader view of the ESA.²¹⁸ For decisions to list species and to designate critical habitat, that characterization has ample factual basis.²¹⁹ But for the entire thirty-eight year history of the ESA, LexisNexis and Westlaw's databases contain only twenty-six decisions specifically invoking the adverse modification prohibition to challenge federal agency actions.²²⁰ Not every litigated matter produces a judicial

213. See, e.g., Houck, *supra* note 24, at 311 (“[T]he ESA’s prohibitions against jeopardy and habitat designation are enforced solely through citizen actions in the courts.”).

214. See, e.g., Robert J. Scarpello, Note, *Statutory Redundancy: Why Congress Should Overhaul the Endangered Species Act to Exclude Critical Habitat Designation*, 30 B.C. ENVTL. AFF. L. REV. 399, 413 (2003).

215. Houck, *supra* note 24, at 310 (“[T]he ESA’s prohibition on modification of critical habitat is interpreted by courts as strong and unyielding; the prohibition on jeopardy is viewed as discretionary and flexible. Moreover, the absence of designated critical habitat makes a case based on jeopardy highly problematical—if not insurmountable.”); Salzman, *supra* note 25, at 323–27; Josh Thompson, Comment, *Critical Habitat Under the Endangered Species Act: Designation, Re-Designation, and Regulatory Duplication*, 58 ALA. L. REV. 885, 890 (2007).

216. Salzman, *supra* note 25, at 324–27; Scarpello, *supra* note 214, at 413 (“[T]here does not appear to be any case where a court found ‘adverse modification’ of a critical habitat without also finding ‘jeopardy’ to a listed species.”).

217. See, e.g., Jamison E. Colburn, *The Indignity of Federal Wildlife Habitat Law*, 57 ALA. L. REV. 417, 442–43 (2005) (asserting that consultation occurs in the shadow of “the inevitable court challenge”).

218. See, e.g., David J. Hayes, *A Lack of Leadership on All Sides*, 21 ENVTL. F. 46, 46 (2004) (lamenting that “litigators—rather than dealmakers—dominat[e] the ESA landscape of late”).

219. See, e.g., *The Threatened and Endangered Species Recovery Act of 2005: Hearing on H.R. 3824 Before the H. Comm. on Res.*, 109th Cong. 28 (2005) (statement of Craig Manson, Assistant Sec’y of Dep’t of Interior).

220. *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 173, 179, 184 (1978); *Sierra Club v. U.S. Army Corps of Engineers*, 645 F.3d 978, 991–92 (8th Cir. 2011); *Ctr. for Biological Diversity v.*

decision, and not all judicial decisions are published on LexisNexis or Westlaw. Additionally, the amount of critical habitat litigation is increasing dramatically, with nineteen of the adverse modification decisions issued in just the last six years.²²¹ But with the 2005–2009 period producing over 4,000 biological opinions only for *fish* species,²²² only twenty-six judicial opinions for *all* species over the entire life of the statute seems to be a rather small number.²²³ Even five decisions in

U.S. Forest Serv., 408 Fed. App'x 64, 65–66 (9th Cir. 2011); *Butte Envtl. Council v. U.S. Army Corps of Eng'rs*, 620 F.3d 936, 947–48 (9th Cir. 2010); *Miccosukee Tribe v. U.S.*, 566 F.3d 1257, 1262–63 (11th Cir. 2009); *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 524 F.3d 917, 924 (9th Cir. 2008); *Ctr. for Native Ecosystems v. Cables*, 509 F.3d 1310, 1322 (10th Cir. 2007); *Gifford Pinchot Task Force v. U.S. Fish & Wildlife Serv.*, 378 F.3d 1059, 1063 (9th Cir. 2004); *Am. Rivers v. Nat'l Marine Fisheries Serv.*, No. 97-36159, 1999 U.S. App. LEXIS 3860, at *3–4 (9th Cir. Jan. 11, 1999); *Nat'l Wildlife Fed'n v. Coleman*, 529 F.2d 359, 361 (5th Cir. 1976); *Ctr. for Biological Diversity v. U.S. Bureau of Land Mgmt.*, No. 09–CV–8011–PCT–PGR, 2011 WL 4551175 (D. Ariz. 2011); *Ctr. for Biological Diversity v. Salazar*, No. CV 07–484 TUC–AWT, 2011 WL 2160254 (D. Ariz. 2011); *In re Consol. Salmonid Cases*, Nos. 1:09–CV–01053, 1:09–CV–01090, 1:09–CV–01373, 1:09–CV–01520, 1:09–CV–01580, 1:09–CV–01625, 2011 WL 4552293 (E.D. Cal. 2011); *San Luis & Delta-Mendota Water Auth. v. Salazar*, 760 F. Supp. 2d 855, 943–47 (E.D. Cal. 2010); *Forest Serv. Emps. for Envtl. Ethics v. U.S. Forest Serv.*, 726 F. Supp. 2d 1195, 1224–26 (D. Mont. 2010); *S. Yuba River Citizens League v. Nat'l Marine Fisheries Serv.*, 723 F. Supp. 2d 1247, 1276–79 (E.D. Cal. 2010); *Rock Creek Alliance v. U.S. Fish & Wildlife Serv.*, 703 F. Supp. 2d 1152, 1162 (D. Mont. 2010); *Pac. Coast Fed'n of Fishermen's Ass'n v. Gutierrez*, 606 F. Supp. 2d 1122, 1145 (E.D. Cal. 2008); *Nez Perce Tribe v. NOAA Fisheries*, No. CV-07-247-N-BLW, 2008 U.S. Dist. LEXIS 28107, at *4–*5 (D. Idaho Apr. 7, 2008); *Natural Res. Def. Council v. Kempthorne*, 506 F. Supp. 2d 322, 328 (E.D. Cal. 2007); *Or. Natural Desert Ass'n v. Lohn*, 485 F. Supp. 2d 1190, 1194 (D. Or. 2007); *Ctr. for Biological Diversity v. Bureau of Land Mgmt.*, 422 F. Supp. 2d 1115, 1121 (N.D. Cal. 2006); *Natural Res. Def. Council v. Rodgers*, 381 F. Supp. 2d 1212, 1219 (E.D. Cal. 2005); *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 235 F. Supp. 2d 1143, 1159 (W.D. Wash. 2002); *Idaho Rivers United v. Nat'l Marine Fisheries Serv.*, No. C94-1576R, 1995 WL 877502, at *3 (W.D. Wash. Nov. 9, 1995). Because the case includes an independent analysis of critical habitat impacts, I have also included *Preserve Our Island v. Army Corps of Engineers*, No. C08-1353RSM, 2009 WL 2511953, at *1, *4 (W.D. Wash. Aug. 13, 2009), in which the plaintiffs successfully challenged a determination that formal consultation was unnecessary, in this group. However, in general I have not included cases challenging alleged failures to consult, because in most of those decisions the court makes no attempt to provide a separate analysis for critical habitat protection. *See, e.g., W. Watersheds Project v. Kraayenbrink*, 632 F.3d 472, 496–97 (9th Cir. 2011).

221. *See supra* note 220 (listing cases). I also have not included cases involving jurisdictional motions or other procedural litigation, and instead have listed only cases decided on the merits. The table below shows when adverse modification cases were decided. The 2011 numbers extend only through October 28.

Time Period	1973–1976	1976–1980	1981–1985	1986–1990	1991–1995	1996–2000	2001–2005	2006–2010	2011
Cases	1	1	0	0	1	1	2	14	5

222. *See supra* notes 143–45 and accompanying text.

223. For older data on numbers of consultations, see U.S. GEN. ACCOUNTING OFFICE, ENDANGERED SPECIES ACT: TYPES AND NUMBER OF IMPLEMENTING ACTIONS 28–31 (1992).

a single year represents a tiny fraction of the total number of biological opinions. The relatively small number of published cases strongly suggests that the overwhelming majority of adverse modification decisions are not litigated, and that the extent of judicial oversight over most consultation processes is minimal.

The few decisions that do exist call into question the prior hypotheses about judicial review of adverse modification decisions. First, several commentators, observing that no court had ever set aside a no-adverse-modification determination without also setting aside a no-jeopardy determination, asserted that the adverse modification inquiry had assumed no independent significance for judicial review.²²⁴ Those observations were generally accurate when written, but more recent cases undermine this claim. Courts have set aside no-adverse-modification determinations, finding both errors of law and fact, without also setting aside no-jeopardy determinations.²²⁵ Even when courts have either rejected both no-adverse-modification and no-jeopardy determinations, or have upheld both determinations, they have often—though not always—analyzed the two issues independently.²²⁶ And interestingly, plaintiffs have done rather well, winning nineteen of the twenty-six adverse modification cases.²²⁷ The overall body of cases remains too small to support definitive conclusions about judicial approaches, but at the very least, the cases indicate that courts usually ascribe independent procedural and substantive significance to the ESA's adverse modification requirements.

Second, the judicial decisions provide little support for the assertion that critical habitat designations add stringency to judicial review of no-jeopardy determinations. The authors who developed this hypothesis did so by evaluating a few early consultation cases. They found that in cases involving designated critical habitat, no-jeopardy determinations were set aside, while in some others not involving critical habitat, no-jeopardy determinations were upheld.²²⁸ Initially, those older cases

224. See *supra* note 202 and accompanying text.

225. *Gifford Pinchot Task Force*, 378 F.3d at 1069–70 (rejecting the regulatory definition of adverse modification); *Nez Perce Tribe*, 2008 U.S. Dist. LEXIS 28107, at *5–6, *32; *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 235 F. Supp. 2d at 1159–61; *Idaho Rivers United*, 1995 WL 877502, at *9–10.

226. See, e.g., *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 524 F.3d 917, 929–36 (9th Cir. 2008) (discussing jeopardy and adverse modification separately). *But see Am. Rivers*, 1999 U.S. App. LEXIS 3860, at *4–9 (holding that the adverse modification analysis was appropriately subsumed within the jeopardy analysis).

227. Until quite recently, all of these plaintiffs were environmental organizations, and LexisNexis and Westlaw contained no cases in which regulated groups challenged a finding that their project would adversely modify critical habitat. However, in late 2010 and early 2011, litigation over major water projects in California's Central Valley produced two such decisions. See *In re Consol. Salmonid Cases*, 2011 WL 455229, *57–66, *119–21; *San Luis & Delta-Mendota Water Auth.*, 760 F. Supp. 2d 855, 943–47 (E.D. Cal. 2010). In both cases, the plaintiffs prevailed, though in each some of their arguments were unsuccessful.

228. See *Houck*, *supra* note 24, at 307–10; *Salzman*, *supra* note 25, at 324–30.

provide thin support for the conclusion. In most of the cases where jeopardy determinations were set aside, the factual circumstances were remarkable, with agencies proposing actions that posed extraordinary threats to listed species' survival.²²⁹ *Tennessee Valley Authority v. Hill*, the seminal ESA case on snail darters, is a good example.²³⁰ The proposed dam was expected to obliterate the species, and the jeopardy prohibition clearly prohibits such an action, even absent a critical habitat designation.²³¹ Those compelling fact patterns, rather than some subliminal effect of a critical habitat designation, provide a simpler explanation for the results.²³² Moreover, at least in the set of decisions available on LexisNexis and Westlaw, no court has ever actually stated that a critical habitat designation changed the outcome of its jeopardy analysis.²³³ If the designations did matter, one would expect a court to say so.

The cases therefore demonstrate that critical habitat can hold independent significance for judicial review and does not just stiffen the jeopardy review process. But the courts hold mixed views on how much critical habitat matters, particularly when incremental habitat degradation is at issue. In several decisions, courts have questioned the services' willingness to allow incremental habitat degradation, often criticizing their failure to acknowledge the relationship between incremental degradation and cumulative harm.²³⁴ One decision has also suggested that any adverse change to critical habitat would constitute

229. *See* *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 171 (1978); *Nat'l Wildlife Fed'n v. Coleman*, 529 F.2d 359, 362–68 (5th Cir. 1976) (describing FWS's repeated efforts to assert that the proposed project posed a major threat to a listed species).

230. 437 U.S. 153 (1978).

231. *Id.* at 171 (“We begin with the premise that operation of the Tellico Dam will either eradicate the known population of snail darters or destroy their critical habitat.”).

232. One can also readily find cases in which jeopardy findings were set aside without any discussion of critical habitat. *See, e.g.,* *Pac. Coast Fed'n of Fisherman's Ass'n v. Nat'l Marine Fisheries Serv.*, 265 F.3d 1028 (9th Cir. 2001).

233. The closest case is *Sierra Club v. Froehlke*, 534 F.2d 1289 (8th Cir. 1976), in which the court stated: “It is significant that the Secretary of the Interior has the power . . . to designate a critical habitat for an endangered species immediately No such power has been invoked with regard to the Indiana bat and the Meramec Lake Park Project.” *Id.* at 1301 n.37. But earlier in the same footnote, the court remarked that “even if these caves were presently designated ‘critical habitat,’ we could not say that trial court determination, namely that § 7 is not being violated, is clearly erroneous.” *Id.*

234. *See* *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 524 F.3d 917, 934 (9th Cir. 2008) (criticizing NMFS's critical habitat determination for its failure to “adequately consider the proposed action's short-term negative effects in the context of the affected species' life cycles and migration patterns”); *Nez Perce Tribe v. Nat'l Marine Fisheries Serv.*, No. CV-07-247-N-BLW, 2008 WL 938430, at *10 (D. Idaho Apr. 7, 2008) (“This wide-spread degradation of habitat means, according to NOAA, that each additional increment of habitat loss could result in an exponential increase in the extinction risk. Given these findings, the Court cannot conclude that the action area is too small to matter.” (internal quotation marks and citation omitted)); *Or. Natural Desert Ass'n v. Lohn*, 485 F. Supp. 2d 1190, 1198–202 (D. Or. 2007).

adverse modification.²³⁵ But in several other decisions, courts have allowed no-adverse-modification determinations to stand, even where the projects were expected to degrade habitat.²³⁶

No case better illustrates this latter approach than the U.S. Court of Appeals for the Ninth Circuit's recent decision in *Butte Environmental Council v. U.S. Army Corps of Engineers*.²³⁷ There, the court considered a challenge to a proposed development project that would have allowed the filling of wetlands designated as critical habitat.²³⁸ A significant area surrounding the wetlands was also designated as critical habitat, and the project would have impacted that area as well.²³⁹ In total, according to FWS, "the proposed development would destroy 234.5 acres of . . . critical habitat" of two endangered animal species.²⁴⁰ A listed plant species also was present, and 242.2 acres of its critical habitat "would be destroyed."²⁴¹ The court emphasized that these areas represented less than 1% of the total designated critical habitat of each species, but it also acknowledged that "the proposed project would contribute to a local and range-wide trend of habitat loss and degradation."²⁴² FWS nevertheless issued no-adverse-modification and no-jeopardy determinations, and the lawsuit ensued.²⁴³ As the Ninth Circuit's opinion clarifies, no question existed that the project would have destroyed hundreds of acres of critical habitat, and no one could dispute that the ESA expressly forbids federal agencies from approving actions likely to "result in the destruction or adverse modification" of critical habitat.²⁴⁴ But the court allowed the action to proceed.²⁴⁵ The court concluded that "[t]he FWS's determination that critical habitat would be destroyed was thus not inconsistent with its finding of no 'adverse modification.' After all, the project would affect only a very small percentage of each affected species' critical habitat"²⁴⁶

235. See *S. Yuba River Citizens League v. Nat'l Marine Fisheries Serv.*, 723 F. Supp. 2d 1247, 1278–79 (E.D. Cal. 2010) (implying that adverse modification should be found unless the project's impacts were likely to be "at worst neutral").

236. *Butte Env'tl. Council v. U.S. Army Corps of Eng'rs*, 620 F.3d 936, 947–48 (9th Cir. 2010); *Micosukee Tribe of Indians v. United States*, 566 F.3d 1257, 1269–71 (11th Cir. 2009) (upholding a biological opinion for a project that undisputedly would cause short-term harm to species habitat); *Rock Creek Alliance v. U.S. Forest Serv.*, 703 F. Supp. 2d 1152, 1171, 1199 (D. Mont. 2010) (upholding a no-adverse-modification determination despite uncontested evidence that critical habitat would be slightly degraded).

237. 620 F.3d 936.

238. *Id.* at 941–44 (describing the project and its impacts).

239. *Id.* at 944.

240. *Id.* The project proponent planned to offset some of these impacts through restoration or protection of similar habitat elsewhere. *Id.* at 579. However, the mitigation program extended only to impacted aquatic habitat, not to all of the habitat that would be destroyed. See *id.*

241. *Id.*

242. *Id.* (quoting FWS's biological opinion) (internal quotation marks omitted).

243. *Id.*

244. 16 U.S.C. § 1536(a)(2) (2006).

245. *Butte Env'tl. Council*, 620 F.3d at 947–48.

246. *Id.* During recent litigation over major California water projects, plaintiffs challenging

D. *Summarizing Critical Habitat's Role*

The foregoing discussion suggests that critical habitat designations have little effect upon consultation processes and only modest effects upon judicial review. The effects are not nonexistent; the adverse modification prohibition has affected the outcome of a growing set of cases, even if a gap exists between the requirements articulated by the statute and those sometimes enforced by the courts. Agency biologists involved in consultation processes asserted that critical habitat designations also affect negotiations between the services and action agencies. But the effects of critical habitat designations upon the regulators and upon judicial review still have been minor.

That does not mean that critical habitat is unimportant. Even if designations result in little additional regulatory constraint, they send signals to action agencies and private entities. Unlike the listing of a species, which signals the possibility of ESA-related regulatory constraints only if one knows where the species is likely to live, lines on a map are easy to understand. Designations therefore can help landowners and action agencies avoid conflict with species' needs.²⁴⁷ Even if critical habitat does not substantially change the services' regulatory approaches, regulated entities seem to believe that designations do increase regulatory stringency, and that belief may also deter some activities that might otherwise harm species.²⁴⁸ And designations may affect the regulatory approaches of other environmental agencies by providing a signal that some habitats are particularly important.²⁴⁹ The signals are not uniformly beneficial to species. The agencies have complained that when designations are finalized, undesignated habitat actually becomes harder to protect,²⁵⁰ and one study has suggested that proposed designations can spur preemptive conversion of habitat.²⁵¹ The extent of these effects is also

adverse modification findings attempted to build on this reasoning by arguing that FWS and NMFS were compelled to identify an allowable increment of habitat degradation. Though the court seems to have sympathized with the argument that some increment of degradation should be allowable, it rejected arguments that the services needed to quantify those increments. *See In re Consol. Salmonid Cases*, Nos. 1:09-CV-01053, 1:09-CV-01090, 1:09-CV-01373, 1:09-CV-01520, 1:09-CV-01580, 1:09-CV-01625, 2011 WL 4552293, *57–58 (E.D. Cal. 2011); *San Luis & Delta-Mendota Water Auth. v. Salazar*, 760 F. Supp. 2d 855, 943–46 (E.D. Cal. 2010)

247. *See* Telephone Interview with FWS Biologist (Jan. 26, 2011) (observing that action agencies will sometimes try to avoid siting projects in critical habitat areas). They can also inflame conflict. *See* Salzman, *supra* note 25, at 336 (quoting a former FWS official who stated that “[a]s soon as you draw a line on the map, they see it as the first step toward the feds condemning the land”).

248. *See supra* Table 3.

249. *See, e.g.*, Cal. State Water Res. Control Bd., Order WR 2000-13, at 26 & n.18 (2000) (referring to a critical habitat designation when determining the appropriate extent of fish protection).

250. Telephone Interview with FWS Biologist (Dec. 7, 2010).

251. *See* John A. List et al., *Is the Endangered Species Act Endangering Species?* 1–2 (Nat'l Bureau of Econ. Research, Working Paper No. 12777, 2006), *available at*

far from certain and is a worthy subject for additional research. But most of the biologists I interviewed agreed that providing a warning about the presence of listed species does promote those species' protection.

In addition, the process of designating critical habitat can provide information that helps the services implement other statutory requirements. That process currently includes an effort to identify some of the species' key habitat needs.²⁵² While some of that information already may be available to agency staff—the agencies routinely consider habitat threats in listing decisions and jeopardy analyses—several biologists told me that the critical habitat designation process leads to a more thorough and rigorous analysis of habitat needs.²⁵³ Understanding those habitat needs is important for many areas of ESA implementation, and information developed through the critical habitat designation process therefore could help the agencies as they engage in consultations, write recovery plans, negotiate habitat conservation plans, and target spending to conservation and recovery projects.²⁵⁴

In short, critical habitat does matter. But critical habitat has not yet mattered in quite the ways or to quite the extent that the statutory language would lead one to expect. That could change, of course, and several biologists thought that regulatory protection of critical habitat would evolve. But to date, any perception of substantially increased regulatory protection for species, or of heightened regulatory burdens for regulated entities, is mostly a mirage.

IV. HABITAT PROTECTION AND THE NARRATIVES OF THE ESA

Thus far, this Article may read like an attempt to document a scandal. A core axiom of our administrative law system—indeed, our legal system—is that agencies should implement the law as it is written.²⁵⁵ Administrative policy disagreements with legal requirements are no basis for nonimplementation, at least in the view of most scholars and judges,²⁵⁶ for we are, we tell ourselves, a nation run by “a

<http://www.nber.org/papers/w12777>.

252. See, e.g., Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Polar Bear (*Ursus maritimus*) in the United States, 75 Fed. Reg. 76,086, 76,115 (Dec. 7, 2010) (to be codified at 50 C.F.R. pt. 17) (identifying the “primary constituent elements” of polar bear habitat).

253. E.g., Telephone Interview with FWS Biologist (Nov. 4, 2010).

254. See 16 U.S.C. 1533(f) (2006) (calling for recovery plans); *id.* § 1534 (authorizing habitat acquisition programs); *id.* § 1539(a) (authorizing habitat conservation plans).

255. See David S. Tatel, *The Administrative Process and the Rule of Environmental Law*, 34 HARV. ENVTL. L. REV. 1, 2 (2010).

256. See *North Carolina v. U.S. EPA*, 531 F.3d 896, 910 (D.C. Cir. 2008) (“All the policy reasons in the world cannot justify reading a substantive provision out of a statute.”). For a contrary view, see Antonin Scalia, *The Doctrine of Standing as an Essential Element of the Separation of Powers*, 17 SUFFOLK U. L. REV. 881, 897 (1983) (“The ability to lose or misdirect laws can be said to be one of the prime engines of social change . . .”).

government of laws, not of men.”²⁵⁷ With critical habitat, that faithful implementation has not happened. The services have provided substitute protections, but to some, the mitigation measures and conditions may seem rather unimpressive—the sops thrown out by an administrative law system “geared,” as one scholar recently put it, “almost entirely to the legalization of natural resource damage.”²⁵⁸ Others may be tempted to draw a rather different conclusion. They may see the agencies’ efforts as attempts—only partial and perhaps futile—to inject some restraint into an unreasonable law that, if faithfully implemented, would impose remarkably rigid constraints across much of the American landscape.²⁵⁹

These conclusions would lead in almost entirely opposite directions, except for one shared conviction: in both of these narratives, the existing system of endangered species protection is deeply flawed and requires fundamental reforms. Yet this Part argues that both narratives are at best incomplete. There are significant problems with existing regulatory approaches, and Part V explains how those problems might be addressed. But there is also much to commend in those existing approaches. This Part therefore explains why, despite what may initially seem like empirical evidence of agency malfeasance, this study provides little support for some of the prevalent cynicism about ESA implementation and more generally, about environmental and administrative law, and why the reforms this Article proposes involve selective tinkering rather than a comprehensive overhaul.

A. *The Persistence of Flexibility*

At a press conference in 2008, then-Secretary of the Interior Dirk Kempthorne referred to the ESA as “perhaps the least flexible law Congress has ever enacted.”²⁶⁰ This was not a new claim. For years, the ESA’s many political and academic critics have argued that it creates an unreasonably rigid regulatory scheme.²⁶¹ Many critics contrast that

257. *Youngstown Sheet & Tube Co. v. Sawyer*, 343 U.S. 579, 646 (1952) (Jackson, J., concurring).

258. Wood, *supra* note 48, at 55.

259. See generally CHARLES C. MANN & MARK L. PLUMMER, *NOAH’S CHOICE: THE FUTURE OF ENDANGERED SPECIES* 224 (1995).

260. Dirk Kempthorne, Former Sec’y of the Interior, Remarks by Secretary Kempthorne, Press Conference on Polar Bear Listing (May 14, 2008), available at <http://www.fws.gov/home/feature/2008/polarbear012308/pdf/press-conference-remarks.pdf>.

261. See, e.g., MANN & PLUMMER, *supra* note 259, 212–24 (characterizing the statute as fatally flawed because of its inflexibility); M. Reed Hopper, *Too Much Power for Too Little Results*, 21 ENVTL. F. 47, 47 (2004) (“First, under the [A]ct the federal government asserts virtually absolute power over land and water use. Second, the [A]ct does not balance the cost of species protection with the impacts on humans.”); Andrew P. Morriss & Richard L. Stroup, *Quartering Species: The “Living Constitution,” the Third Amendment, and the Endangered Species Act*, 30 ENVTL. L. 769, 785–86, 788–90 (2000) (“[T]he ESA was designed around a command-and-control model.”); William F. Pedersen, *Using Federal Environmental Regulations to Bargain for Private Land Use Control*, 21 YALE J. ON REG. 1, 3–4 (2004) (criticizing the statute as a case study in “command-and-control” regulation).

flawed rigidity with administrative reforms or alternative regulatory approaches designed to introduce more creativity, negotiation, flexibility, and decentralization to the regulatory process.²⁶² All of those critiques track some of the broader narratives of environmental law. Both political and academic critics often assert that traditional regulatory approaches are too top-down, rigid, and insensitive to local conditions, that they are ultimately antithetical to the sort of innovation an effective legal regime should promote, and that they should be dramatically reformed.²⁶³

The allegation that the ESA is rigidly implemented is impossible to reconcile with the agencies' actual track record. Every study to consider the section 7 process has found that jeopardy and adverse modifications are rare, and that even when the services do find jeopardy or adverse modification, projects still generally proceed.²⁶⁴ My study confirms those prior results and adds two additional findings. First, even when projects are clearly expected to degrade critical habitat and to take listed species, jeopardy and adverse modification determinations are still very infrequent.²⁶⁵ Moreover, that rarity has persisted despite a series of cases successfully challenging regulations authorizing permissive approaches.²⁶⁶ Second, for some classes of actions with major habitat impacts, formal consultation happens hardly at all.²⁶⁷

The ESA does still impose procedural and substantive constraints on many individual projects, but the nature of those constraints undermines some of the classic critiques of the ESA. Those conventional critiques often assert that the ESA, and federal environmental law generally, are insensitive to local conditions.²⁶⁸ But actual biological opinions reveal that both FWS and NMFS usually try to craft location-specific

262. *E.g.*, MANN & PLUMMER, *supra* note 259, at 219 (arguing for different approaches in different regions); *id.* at 224–33 (arguing that the ESA's regulatory provisions should not automatically be invoked following a listing and that a habitat purchase should be emphasized as an alternative to regulatory prohibitions); Pedersen, *supra* note 261, at 3–4; Thompson, Jr., *supra* note 30, at 321 (“Virtually all interested parties agree that the ESA can be significantly improved, despite their vocal disagreement as to how this should be achieved.”).

263. *See, e.g.*, Carol A. Casazza Herman et al., *Breaking the Logjam: Environmental Reform for the New Congress and Administration*, 17 N.Y.U. ENVTL. L.J. 1, 1 (2008) (asserting that the United States is “burdened with obsolescent statutes and regulatory strategies”); Stewart, *supra* note 39, at 203, 213–14.

264. *See supra* note 164 and accompanying text.

265. *See supra* Table 2.

266. *See* Gifford Pinchot Task Force v. U.S. Fish & Wildlife Serv., 378 F.3d 1059, 1069–71 (9th Cir. 2004); N.M. Cattle Growers Ass'n v. U.S. Fish & Wildlife Serv., 248 F.3d 1277, 1283 n.2 (10th Cir. 2001); Sierra Club v. U.S. Fish & Wildlife Serv., 245 F.3d 434, 441–42 (5th Cir. 2001).

267. *See, e.g.*, *supra* notes 170–71 and accompanying text.

268. *E.g.*, Herman et al., *supra* note 263, at 3–6 (criticizing federal environmental law's allegedly heavy reliance “on top-down, hierarchical regulatory approaches” and arguing that states can be “more nimble” in developing localized responses); Jonathan Remy Nash, *Trading Species: A New Direction for Habitat Trading Programs*, 32 COLUM. J. ENVTL. L. 1, 7 (2007) (“[T]he Act adopts the clumsy and inefficient centralized command-and-control mechanism.”).

protective measures.²⁶⁹ Rather than evolving through the top-down edicts of insulated bureaucrats in Washington, those measures originate at regional or field offices, usually through ongoing negotiations with regulated entities.²⁷⁰ More generalized standards do evolve,²⁷¹ but the process is often bottom-up and negotiation-driven, with field or regional office biologists working frequently with regulated agencies to develop standards for particular classes of projects.²⁷²

This process is not cost-free, of course.²⁷³ Consultation takes time, and project conditions require money to implement. But the scheme is implemented in cost-sensitive ways. First, the constant use of negotiations provides opportunities to identify mitigation measures with relatively low financial cost and relatively high environmental returns. Second, the selective but frequent use of generic standards suggests that action agencies and the services are sensitive to the tradeoff between more broadly applicable standards (which can provide greater predictability for project designers and expedite the consultation process), and site-specific conditions (which can provide more carefully tailored protection), and are attempting to manage that tradeoff in a manner that balances cost-reduction and environmental protection.²⁷⁴

The process also offers some opportunities for learning, adaptation, and regulatory evolution. Because the services repeatedly interact with the same agencies,²⁷⁵ and because they routinely require monitoring of the implementation of their projects and of direct takes of species, they have created mechanisms for feedback.²⁷⁶ These mechanisms are far from perfect. Biological opinions rarely require contributions to species population or distribution monitoring, even though such monitoring might provide important data for developing broader conservation and

269. See *supra* notes 197–201 and accompanying text.

270. See Amy Sinden, *In Defense of Absolutes: Combating the Politics of Power in Environmental Law*, 90 IOWA L. REV. 1405, 1494 (2005) (“Ultimately, then, the ESA’s absolute standards involve a negotiation between environmental and economic interests . . .”).

271. See Telephone Interview with NMFS Biologist (Nov. 16, 2010) (explaining that the services increasingly rely on standardized conditions, partly because those conditions lower administrative costs and partly because action agencies are willing to accept more protective conditions as a tradeoff for regulatory certainty).

272. *Id.*

273. See, e.g., U.S. GEN. ACCOUNTING OFFICE, *supra* note 162, at 4–5, 54–56 (2004) (describing substantially increased permitting costs that applicants attributed to species listings).

274. See Telephone Interview with NMFS Biologist (Nov. 16, 2010) (describing standardized conditions as an important way to expedite consultations and reduce administrative costs).

275. A few agencies—the Army Corps of Engineers, Bureau of Reclamation, Forest Service, and Bureau of Land Management—account for the vast majority of the consultations I reviewed.

276. Almost every opinion I reviewed required some form of monitoring. The action agency was usually required to monitor direct take of the species and to monitor and document its implementation of conservation measures and RPMs. See CONSULTATION HANDBOOK, *supra* note 76, at 9-1 to -2 (describing monitoring requirements).

protection strategies.²⁷⁷ The agencies also have never followed through on a proposal, laid out in their consultation handbook, calling for the creation of a centralized database of monitoring results.²⁷⁸ Agency biologists told me that the actual extent of compliance monitoring is uneven.²⁷⁹ But the agencies are gathering some data and creating some opportunities for dialogue and learning, which is an important start. Agency staff thought this was paying dividends; in interviews, several biologists explained ways that their approaches to mitigation were evolving and improving over time.²⁸⁰

In summary, ESA implementation already involves many of the approaches that would-be reformers suggest are necessary to an effective regulatory scheme, and it involves those elements despite the persistence of an old-style regulatory structure. To someone who argues that the ESA's basic goals are not worthwhile, that may be small consolation. But many critiques of the ESA focus on means rather than ends, and the means are more sensible than many of the critics acknowledge.²⁸¹ There is enough room for creativity and flexibility within existing approaches to accommodate many of the flexibility-oriented reformers' stated goals.

B. *The Absence of Capture*²⁸²

This Article is not the first to challenge the common view that the ESA is a rigidly implemented statute or that environmental law generally is inflexibly implemented by bureaucratic zealots. For decades, some commentators have argued that the ESA actually is quite pliable—excessively so, some say—in practice.²⁸³ Perhaps the most

277. On the importance of such monitoring, see generally Eric Biber, *The Problem of Environmental Monitoring*, 83 U. COLO. L. REV. (forthcoming 2011).

278. See CONSULTATION HANDBOOK, *supra* note 76, at 9-2 to 9-6 (describing this program). I found no evidence of its existence.

279. *E.g.*, Telephone Interview with FWS Biologist (Nov. 17, 2010) (stating that the services have little capacity to do follow-up work).

280. Telephone Interview with NMFS biologist (Nov. 16, 2010) (describing the evolution of negotiated standardized conditions); Telephone Interview with NMFS Biologist (Nov. 22, 2010) (describing increased interest in offsite mitigation).

281. Many critiques of the ESA argue that the core problem with the Act is not that its goals are not worthwhile but instead that its means create perverse incentives. See, e.g., Angela Logomasini & Robert J. Smith, *Protect Endangered Species*, in LIBERATE TO STIMULATE: A BIPARTISAN AGENDA TO RESTORE LIMITED GOVERNMENT AND REVIVE AMERICA'S ECONOMY 55, 55 (Ivan Osorio & Wayne Crews eds., 2010) ("The Endangered Species Act (ESA) of 1973 is bad for wildlife, because it is bad for people.").

282. A "captured" agency has become controlled by the entities it is supposed to be regulating. See Thomas W. Merrill, *Capture Theory and the Court: 1967–1983*, 72 CHI.-KENT L. REV. 1039, 1043 (1997).

283. See, e.g., Houck, *supra* note 24, at 279; Sinden, *supra* note 270, at 1491–510; Ray Vaughan, *State of Extinction: The Case of the Alabama Sturgeon and Ways Opponents of the Endangered Species Act Thwart Protection for Rare Species*, 46 ALA. L. REV. 569, 596–97 (1995) ("[V]irtually all of the work of the FWS under the ESA seems to favor industry."). The

eloquent advocate of this view is Professor Oliver Houck, who once argued that “[a] handful of piers for powerboats in designated critical habitat areas aside, there is no evidence that formal consultation under the Endangered Species Act is stopping the world. Indeed, there is little evidence that it is changing it very much at all.”²⁸⁴ In Houck’s widely shared view, the implementing agencies have responded to intense political pressure by reading rigid mandates out of the statute and interpreting it as largely discretionary.²⁸⁵ Then they have invoked that discretion to avoid imposing meaningful regulatory control.²⁸⁶ Some of these critics are more sanguine about the ESA’s protective force, but they still argue that it protects listed species only because the facial rigidity of its mandates means that even a watered-down version of the ESA still holds substantial force.²⁸⁷ In short, while the unsympathetic critics view the ESA as the poster child for regulatory rigidity run amok, many sympathetic critics view it as a classic study in regulatory accommodation and capture.

The evidence that this dynamic *sometimes* exists is overwhelming,²⁸⁸ and this study provides some new support for this view. Most importantly, a central conclusion of this study is that the adverse modification prohibition has barely been implemented, and that the services have eschewed faithful application of the statute in favor of a more discretionary approach that often allows projects to degrade designated critical habitat.²⁸⁹ The capture-and-accommodation hypothesis provides a plausible explanation for that choice. Similarly, both individual biological opinions and individual court cases demonstrate that the agencies sometimes adopt strained reasoning in support of no-adverse-modification decisions, sometimes in response to acknowledged political pressure.²⁹⁰ That strained reasoning suggests a

ESA literature also contains many views between these poles. *E.g.*, STEVEN LEWIS YAFFEE, PROHIBITIVE POLICY: IMPLEMENTING THE FEDERAL ENDANGERED SPECIES ACT 70–71, 84–85 (1982) (observing that facially prohibitive policies are actually implemented with flexibility); Bradley C. Karkkainen, *Biodiversity and Land*, 83 CORNELL L. REV. 1, 21–22 (1997); J.B. Ruhl, *supra* note 40, at 886 (arguing that the ESA is sometimes a “pit bull” but also “has accommodated well-planned land development around the nation with a measure of flexibility not characteristic of many other environmental laws”).

284. Houck, *supra* note 24, at 321.

285. *Id.* at 279 (“[T]he Departments of Interior and Commerce . . . have converted an act of specific stages and clear commands into an act of discretion.”); *see also* Holly Doremus, *Adaptive Management, the Endangered Species Act, and the Institutional Challenges of “New Age” Environmental Protection*, 41 WASHBURN L.J. 50, 62 (2001) (describing “[t]he tendency to use discretion to reduce the protection of biological resources under political pressure”).

286. Houck, *supra* note 24, at 279 (“[T]he ESA has accommodated the overwhelming majority of human activity without impediment.”); Vaughan, *supra* note 283, at 596–97.

287. *See* Sinden, *supra* note 270, at 1498.

288. *See, e.g.*, Holly Doremus, *Scientific and Political Integrity in Environmental Policy*, 86 TEX. L. REV. 1601, 1603–09 (2008) (describing several recent controversies).

289. *See supra* Part III.

290. *See* Natural Res. Def. Council v. Rodgers, 381 F. Supp. 2d 1212, 1220 (E.D. Cal. 2005) (quoting agency emails about a politically driven no-jeopardy opinion); Seattle Audubon

vigorous effort to avoid imposing regulatory constraints. Though these machinations may sometimes seem remarkable, the motivation behind them is not hard to understand. No one could credibly dispute that the political pressures against species protection are persistent and intense.

But much of the evidence produced by this study does *not* comport with assertions that the services are captured agencies. Most importantly, the evidence indicates that the services are using the ESA to change thousands of proposed projects. Even as they have allowed the critical habitat protections to languish, they consistently have been finding that proposed projects will “take” species and have been imposing “reasonable and prudent measures,” many of which appear extensive and meaningful, upon almost all of the projects they review.²⁹¹ Though those “reasonable and prudent measures” are sometimes minimal or hortatory, the services have multiple other ways, all frequently used, to minimize projects’ adverse effects, and often to change projects so that they provide net benefits for species’ habitat.²⁹² Compared to a baseline of complete ESA implementation, the results may seem disappointing, but they still represent much more environmental protection than the services would ever accomplish if they really were acting only in response to litigation—which, as discussed above, is relatively rare.

The time involved in consultation processes also provides an indication that the agencies are not pushover regulators. Though biologists told me some ways in which they had tried to expedite the consultation process, none suggested that they were doing so at the expense of species protection, and particularly for complex projects, the consultation process can last months or even years.²⁹³ Nor did any of the biologists I spoke with fit the model of a captured bureaucrat. Instead, I heard consistent commitment to the underlying statutory goal of species protection, and consistent description of the ways biologists tried to fulfill that commitment. The biologists believe, as one put it, that under section 7 they “have a lot of flexibility to do things that are good for species,”²⁹⁴ and that they are actively putting that flexibility to use. They were aware, of course, of the political controversies associated with the ESA, and some acknowledged ways in which those pressures affected their work.²⁹⁵ Some also expressed frustration with what they

Soc’y v. Evans, 771 F. Supp. 1081, 1089 (W.D. Wash. 1991), *aff’d*, 952 F.2d 297 (9th Cir. 1991) (documenting heavy political pressure to adopt marginally protective approaches); *see also supra* notes 183–185 and accompanying text.

291. *See supra* Table 2.

292. This finding also contravenes the commonly asserted view that the agencies rarely regulate under Section 9. *See, e.g.*, Vaughan, *supra* note 283, at 597 (“[T]he prohibitions against takings in section 9 are not enforced with anything resembling vigor.”); Thompson, Jr., *supra* note 30, at 315.

293. *See* U.S. GEN. ACCOUNTING OFFICE, *supra* note 164, at 3–5.

294. Telephone Interview with FWS Biologist (Dec. 21, 2010).

295. *See, e.g.*, Telephone Interview with FWS Biologists (Nov. 3, 2010) (acknowledging that Section 7 implementation is politically sensitive).

perceived as a failure to develop the concept of adverse modification or to use it to its full potential.²⁹⁶ They were similarly aware of the influence of litigation upon implementation; in fact, several mentioned that *Gifford Pinchot Task Force* and related cases had compelled (or empowered) the services to rethink their approach to critical habitat.²⁹⁷ But both interviews and documentary evidence demonstrate that a public choice-based theory of administrative governance, in which the services simply respond to the balance of power created by development interests' lobbying and environmental groups' lawsuits, misses a key part of the story. Instead, a meaningful regulatory effort comes from within the agencies.

The core point of this discussion is not that the existing approaches to habitat protection are wonderful and in no need of change. A regulatory approach that diverges from statutory requirements is obviously problematic, particularly if the divergence threatens to undermine achievement of the basic statutory goal of removing species from the list. That possible divergence is not just harmful to species. For potentially regulated entities, recovery means a respite from some of the regulatory stringency of the ESA and therefore ought to bring significant economic benefits. But even with those caveats, the services' efforts support an unconventionally positive view of at least part²⁹⁸ of the existing regulatory scheme. The ESA has already given the services useful tools to work with, and the services have used those tools in creative, pragmatic, and often effective ways. With modest reforms—none of them actually requiring legislative changes—providing more effective tools, the services could do even better.

296. See, e.g., Telephone Interview with FWS Biologist (Dec. 21, 2010) (explaining a common perception that biologists were “just documenting the demise until nothing’s left . . . [we] probably need a higher-level discussion on doing these analyses”).

297. See, e.g., Telephone Interview with NMFS Biologist (Nov. 22, 2010) (stating that *Gifford Pinchot Task Force* gave her more leverage to push for conditions that promoted recovery).

298. I am not arguing that this moderately rosy view of administrative agency practice should extend to the processes of listing species or of designating critical habitat. In both processes, litigation is a crucial spur to action. But a decision to include something—whether that something is a species, habitat area, or chemical—in a regulatory system may involve very different dynamics than decisions about how to go about regulating the thing once the obligation to regulate is clear. The former type of decision often depends upon a firm push from litigation or legislation. See, e.g., *Massachusetts v. EPA*, 549 U.S. 497, 505 (2007) (responding to EPA’s reluctance to expand its regulatory program to encompass greenhouse gas emissions); DANIEL A. FARBER ET AL., *CASES AND MATERIALS ON ENVIRONMENTAL LAW* 752–53 (8th ed. 2009) (describing EPA’s reluctance to list hazardous air and water pollutants); Owen, *supra* note 142, at 448 (describing EPA’s reluctance to include stormwater sources in its regulatory program until compelled by legislation). The latter sometimes does not.

V. CRITICAL HABITAT AND THE CHALLENGES OF INCREMENTAL DEGRADATION

The preceding discussion indicates that the services are using the ESA to provide substantial habitat protection. Yet, paradoxically, a gap persists between the statutory mandate and actual agency practice. This Part considers why that gap exists, how reforms might address it, and what the gap and its potential fixes reveal about the challenges of regulating small environmental harms.

A. *The Dilemma and the Critical Habitat Response*

Any effort to regulate incremental environmental degradation must address a crucial question: When are harms too small to trigger regulation?²⁹⁹ Yet neither the ESA itself, which suggests a stringent and prohibitory regulatory system, nor the services, which have taken a more permissive course, have developed an effective response.

This dilemma is difficult to resolve partly because each of the obvious answers is flawed. One possibility is to try to prohibit every contribution to the environmental problem, no matter how small. But in practice, the administrative costs of such an approach could be extraordinary, the burdens imposed might outweigh any environmental gain, and both the regulators and the regulated would likely resist implementation.³⁰⁰ Alternatively, regulators might prohibit only those actions that cause major harm (or prohibit nothing at all). But if the environmental problem is primarily caused by small actors, a regulatory approach focusing only on a few major actors will solve little.³⁰¹ Moreover, any system that distinguishes between regulated “large” contributors and unregulated “small” ones faces a line-drawing problem. Environmental harms often exist on a continuum of scales, and if there is no clear distinction between small and large harms, any line will seem somewhat arbitrary.³⁰² The distinction is even harder to draw if, as is often the case, no one knows how much harm each action will cause.³⁰³

299. See, e.g., Kevin M. Stack & Michael P. Vandenberg, *The One Percent Problem*, 111 COLUM. L. REV. (forthcoming), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1844706 (describing the prevalence of these challenges); Madeline June Kass, *A NEPA Climate Paradox: Taking Greenhouse Gases into Account in Threshold Significance Determinations*, 42 IND. L. REV. 47, 62–63, 67, 85 (2009) (analyzing similar questions that arise in NEPA compliance).

300. See Kass, *supra* note 299 at 71.

301. See Michael P. Vandenberg, *From Smokestack to SUV: The Individual as Regulated Entity in the New Era of Environmental Law*, 57 VAND. L. REV. 515, 533–34 (2004).

302. See generally Malcolm L. Hunter, Jr. et al., *Thresholds and the Mismatch Between Environmental Laws and Ecosystems*, 23 CONSERVATION BIOLOGY 1053, 1053 (2009) (commenting on the difficulties of finding regulatory thresholds that correspond to well-defined ecological thresholds).

303. See, e.g., *supra* notes 137–40 and accompanying text (discussing the impossibility of linking greenhouse gas emissions from specific activities to specific increments of habitat

This problem has been the Achilles heel of critical habitat protection. The statute itself suggests a very low regulatory threshold, under which the services would prohibit any federally approved worsening of critical habitat, no matter how minor.³⁰⁴ But without some creative additional measures, such an approach cannot work. The services already are politically embattled and administratively swamped—“barely keeping our heads above water,” as one biologist put it—and it is difficult to imagine them performing individualized consultations on, let alone vetoing, many additional projects.³⁰⁵ Congress, which has preferred using its power of the purse to *undercut* ESA implementation, is unlikely to appropriate the funds necessary to support a larger workload.³⁰⁶ Also, the political backlash against more extensive regulatory prohibitions would almost certainly be intense. Unsurprisingly, the services have not embraced this approach, and they have sometimes assured the world that they never will.³⁰⁷ Instead, they have chosen to prohibit a few major habitat modifications, to allow smaller modifications to proceed subject to conditions, to let other modifications proceed without any regulation at all, and to use a case-by-case approach to drawing the lines. That approach has several positive features—in practice, it limits regulatory overreach and functions rather similarly to the sort of feasibility-based performance standards that air and water quality regulators have successfully relied upon³⁰⁸—but it substitutes other problems.

First, the services’ chosen approach necessitates distinguishing among levels of harm, and the services have struggled to define, let alone justify, the lines. Their regulations and guidance use fuzzy terms, suggesting that thresholds might exist but never explaining what those thresholds were.³⁰⁹ The services now disclaim reliance on even those vague regulations and have not put forth any sort of generalized standard in their place.³¹⁰ Nor have the courts set forth any sort of standard.³¹¹ As a practical matter, individual field offices and individual courts have been left to find thresholds on an ad hoc basis. Their choices have often been permissive, and their justifications sometimes

change).

304. See *supra* notes 104–11 and accompanying text.

305. Telephone Interview with FWS Biologists (Nov. 3, 2010).

306. See Doremus, *supra* note 288, at 1611, 1628, 1630 (describing congressional efforts to hamstring ESA implementation).

307. See *INDUS. ECON., INC. & N. ECON.*, *supra* note 4, at ES-6 (stating that FWS will not use the polar bear critical habitat designation as a basis for regulating climate change).

308. See generally Oliver A. Houck, *Of Bats, Birds and B-A-T: The Convergent Evolution of Environmental Law*, 63 *MISS. L.J.* 403, 410–28 (1994) (explaining, and praising, feasibility-based standards); Wendy E. Wagner, *The Triumph of Technology-Based Standards*, 2000 *U. ILL. L. REV.* 83 (same).

309. See *supra* notes 118–22 and accompanying text.

310. See Jones, *supra* note 123 (abandoning the regulatory definition of “destruction or adverse modification”); Hogarth, *supra* note 124 (same).

311. See *supra* notes 225–31 and accompanying text.

seem premised on the dubious assumption that small harms pose no real threat to species.³¹²

The services' chosen approach also may be insufficiently protective. Recovering species is a core goal of the ESA,³¹³ and for good reason; if a species recovers, the environmental goals of the statute are served and regulated entities should face reduced regulatory burdens, for they will no longer be subject to the ESA's procedural and substantive constraints. But if a species was listed primarily because of the threat of habitat degradation—and, with most species, that was a primary, if not the primary, threat³¹⁴—then allowing additional habitat degradation is fundamentally inconsistent with that goal. With some species, the harmful projects may not be creating an overall negative trend, for the services consistently impose protective conditions (some sufficiently protective to avoid any negative habitat impact), and the public funds many restoration projects.³¹⁵ But in the absence of a rigorous effort to relate individual consultation outcomes to broader species trends, it is very difficult to know if the services are doing enough.³¹⁶ And even if their efforts are producing positive trends, they are doing so by shifting to a subset of regulated projects—and, to a large extent, to the taxpayer—the burden of compensating for the many projects that escape the adverse modification prohibition.

If critical habitat protection is to assume greater significance, and if the gap between the services' implementation approach and statutory requirements is to be reduced, if not closed, the services and the courts must resolve this regulatory thresholds dilemma. They need not throw out everything about their existing approaches, for they already are accomplishing quite a lot through their attempts to minimize each project's impacts. But they do need a few additional tools. The discussion below explains two promising possibilities.³¹⁷

312. *Supra* notes 183–85 and accompanying text.

313. 16 U.S.C. § 1531(a)(4) (2006).

314. Wilcove et al., *supra* note 53, at 609.

315. *See supra* Table 2; *see also supra* notes 182–85 and accompanying text.

316. *See generally* Rose, *supra* note 13, at 279 (“In focusing on individual actors’ behavior, [behavior-based] measures were inattentive to the fact that even small amounts can add up.”).

317. A third possibility, which merits more extensive discussion than this Article has space to provide, would be to integrate the services’ efforts with other agencies’ initiatives to address major problems like climate change or urban sprawl. Such integration might blunt common criticisms of the ESA, which sometimes suggest that the statute pits species protection against all other important social values. *See, e.g.,* MANN & PLUMMER, *supra* note 259, at 213 (“[I]t is not possible to [protect species] and simultaneously ensure that good housing is available and affordable to everyone. Or good health care, for that matter, or a good education.”). But while numerous scholars have emphasized the importance of such integration, the challenges of achieving it are substantial. *See, e.g.,* James E. Krier & Mark Brownstein, *On Integrated Pollution Control*, 22 ENVTL. L. 119, 121–22 (1991) (explaining some of the practical considerations that led EPA to reject an integrated regulatory approach); Ruhl & Salzman, *supra* note 10, at 70–71 (praising the “worthy aspiration” toward a collaborative decision-making model, while subsequently noting the model’s impracticality).

1. Low Thresholds and Offsite Mitigation

While reviewing biological opinions, I found very few uses of offsite mitigation to compensate for onsite environmental impacts.³¹⁸ If a project was going to degrade location A, the services generally imposed conditions to minimize (and sometimes eliminate) that degradation at location A, but they did not require compensatory restoration work at location B. Individual biologists did mention using this approach, but not extensively, and in their experience it was relatively new.³¹⁹ In taking this approach, they were working with little direction or guidance. The services' joint consultation regulations say nothing about offsite mitigation, and their consultation handbook does not prescribe any such approach, let alone provide guidance for its implementation.³²⁰ Nor do the services track the use of such measures.³²¹

This is a strikingly lukewarm embrace of a practice now standard in many other areas of environmental law.³²² Offsite mitigation is now a core part of wetlands protection.³²³ The Clean Air Act specifically prescribes set programs, under which new pollution sources in non-attainment areas must pay existing sources to reduce their emissions.³²⁴ Offsite mitigation is even common practice in "habitat conservation plan[s]" prepared pursuant to ESA section 10.³²⁵ In the view of many environmental scholars, these trading regimes are both economically and environmentally preferable to traditional regulatory approaches, and according to some commentators, their emergence has been a crucially

318. In the pool of 138 biological opinions that I closely reviewed, only a handful called for or referred to offsite mitigation measures. Those measures might have been prescribed in other documents—some biological opinions refer to conditions set forth in the action agency's biological assessment—but the rarity of references to offsite mitigation demonstrates that it is not common practice. One case—*Butte Environmental Council v. U.S. Army Corps of Engineers*—did briefly mention the use of this approach. 620 F.3d 936, 944 (9th Cir. 2010). But the offset program only addressed impacts to wetlands, not to all of the affected critical habitat, suggesting that it may have been driven by the Army Corps' wetland permitting requirements rather than by the ESA's requirements for critical habitat protection. *See id.*

319. *E.g.*, Telephone Interview with NMFS Biologist (Nov. 22, 2010) (explaining that this method is becoming "increasingly prevalent").

320. The handbook does mention the possibility of offsite mitigation in its discussion of conservation measures. *See* CONSULTATION HANDBOOK, *supra* note 76, at 4-19. But the discussion is not at all extensive.

321. *See* Jessica B. Wilkinson & Robert Bendick, *The Next Generation of Mitigation: Advancing Conservation Planning Through Landscape-Level Mitigation Planning*, 40 ENVTL. L. REP. 10,023, 10,034 (2010) ("Our research revealed that the Services do very little in the way of tracking the nature or amount of compensatory mitigation required under § 7 of the ESA.").

322. *See generally* James Salzman & J.B. Ruhl, *Currencies and the Commodification of Environmental Law*, 53 STAN. L. REV. 607, 645-68 (2000).

323. *See id.* at 650-51.

324. 42 U.S.C. § 7503(c) (2006).

325. *See* Salzman & Ruhl, *supra* note 322, at 648-49 & n.102.

important step in the maturation of environmental law.³²⁶

Despite their growing prevalence, these trading approaches have their detractors. Critics have argued that in practice, offsite mitigation often has meant trading ecologically valuable natural systems for dysfunctional artificial substitutes.³²⁷ More broadly, critics assert that trading schemes are excessively complex and often involve trading real environmental degradation for fictional environmental gains.³²⁸ And even though trading programs are designed to reduce opposition to environmental regulation, they rarely eliminate it. Even with mitigation programs in place, regulated entities have still chafed at the extent of environmental regulation and have taken their frustrations as far as the Supreme Court, with some success.³²⁹

The critics raise important points, but the critical habitat experience shows that in the absence of an offsite trading program, many small environmental harms will simply escape regulatory coverage. If a project has significant social utility—if, to use an example cited by one NMFS biologist, it is a small repair that will allow an important existing roadway to remain functional³³⁰—but will unavoidably harm a small habitat area, a biologist must choose between enforcing the letter of the statute at significant social (and potentially political) cost or, alternatively, allowing habitat degradation to proceed without mitigation. It is not hard to imagine what most biologists will choose. Nor is it hard to understand why courts, confronted with what they perceive to be an unyielding mandate to prohibit even the smallest-scale degradation, might try to carve out *de minimis* exemptions that appear nowhere in the statutory text.³³¹ Yet those same impacts might be cheaply mitigated, perhaps by contributing to a dam removal, wetlands restoration project, or purchase of environmental water rights elsewhere

326. See, e.g., Bruce A. Ackerman & Richard B. Stewart, Comment, *Reforming Environmental Law*, 37 STAN. L. REV. 1333, 1338–39 (1985); Salzman & Ruhl, *supra* note 322, at 609–11 (citing some of the voluminous literature on this subject).

327. See NAT'L RESEARCH COUNCIL ET AL., COMPENSATING FOR WETLAND LOSSES UNDER THE CLEAN WATER ACT 1–10 (2001) (summarizing problems with then-prevalent mitigation approaches); Fred Bosselman, *Swamp Swaps: The "Second Nature" of Wetlands*, 39 ENVTL. L. 577, 583 (2009) (summarizing critiques).

328. These concerns have been particularly salient in the debate over climate change mitigation methods. See, e.g., Nick Davies, *The Inconvenient Truth About the Carbon Offset Industry*, THE GUARDIAN, June 16, 2007, <http://www.guardian.co.uk/environment/2007/jun/16/climatechange.climatechange>; see also Salzman & Ruhl, *supra* note 322 (discussing some of the inherent challenges of creating trading systems).

329. See *Rapanos v. United States*, 547 U.S. 715, 722 (2006) (plurality opinion) (describing, with obvious consternation at its scope, the federal regulatory program for wetlands).

330. Interview with NMFS Biologist (Nov. 22, 2010) (describing a road work example).

331. See, e.g., *supra* notes 237–46 (discussing *Butte Env'tl. Council v. U.S. Army Corps of Eng'rs*, 620 F.3d 936 (9th Cir. 2010)). That same temptation may still exist even with an offset program. But an offset program should at least reduce the likelihood that a court will view a prohibition on all adverse modifications as impracticable and absurd.

on the same river, and the action agency and project proponent might be willing to support those efforts as a condition for proceeding with the project.³³² Designing such an offsite mitigation program is no easy task; the extensive critiques of existing programs amply demonstrate that mitigation trading programs require careful design and oversight.³³³ But for critical habitat protection, even modestly effective mitigation efforts should improve upon the status quo.

2. Planning and Standardized Threshold-Setting

Another distinctive feature of the services' current approach is its ad hoc, project-by-project selection of regulatory thresholds. As of this writing, the services have no regulation or even guidance that defines the line between adverse modification and permissible habitat degradation. Nor do they have any process, outside of individual consultations, for drawing that distinction. Agency biologists do discuss the question; several biologists told me that this is often debated in what one described as "geeky section 7 coordinator circles."³³⁴ But none of the biologists felt that the services had resolved the issue, and opinions varied about what the standard should be.³³⁵ To add to the challenge, current agency regulations and guidance place partial blinders on biologists seeking to resolve this question. When conducting consultations, the services may not consider the cumulative impacts of other future projects also subject to consultation.³³⁶

That approach places field biologists in difficult positions. To determine whether an individual project contributes significantly to a larger problem, a field biologist would need to understand the impacts of the full set of activities likely to affect the species. For a biologist swamped with consultation deadlines and struggling to get through the

332. See Wilkinson & Bendick, *supra* note 321, at 10,024 (noting that regulated entities now often see compensatory mitigation "as a cost of doing business").

333. See Salzman & Ruhl, *supra* note 322 (exploring the challenges of developing such programs).

334. Interview with FWS Biologist (Dec. 21, 2010) (on file with author); see also Interview with FWS Biologist (Jan. 12, 2011) (on file with author) ("[S]ection 7 people talk about this endlessly."). *But see* Interview with FWS Biologist (Nov. 4, 2010) (on file with author) (contrasting discussions of jeopardy, which she felt had led to better understanding of the concept, with less-developed discussions about adverse modification).

335. Compare Interview with FWS Biologist (Jan. 12, 2011) (on file with author) (asserting that Congress intended the jeopardy and adverse modification standards to be the same), with E-mail from NMFS Biologist to Dave Owen (Oct. 15, 2010, 2:05 PM) (on file with author) ("I believe the bar for an adverse mod/destruction determination is much lower than a jeopardy determination."), and Interview with FWS Biologist (Dec. 7, 2010) (asserting that "ad mod could be a much lighter trigger" and that it is "sort of problematic" that adverse modification and jeopardy are typically treated as equivalent).

336. CONSULTATION HANDBOOK, *supra* note 76, at 4-31 (excluding future federal actions and any other action that is not "reasonably certain to occur" from the analysis); see also Rohlf, *supra* note 108, at 156 (criticizing this approach as "virtually unworkable").

day's work,³³⁷ stepping back and performing that kind of broader analysis is likely to be impossible, particularly if agency guidance tells that biologist to ignore many future projects.³³⁸ In the absence of that broader perspective, and without the backing of a centralized policy on cumulative impacts, a decision to impose a prohibitive regulatory regime on a project with seemingly minor impacts will be very difficult to make.³³⁹ Occasionally agency biologists will be willing to do so, but it should be no surprise if often they are not.

Again, other environmental laws offer better alternatives, with the most robust example coming from air quality planning. Every year, air quality planners in non-attainment zones across the country confront a challenge like the habitat degradation problems faced by FWS and NMFS.³⁴⁰ Rarely is regional air quality determined by the emissions from a single facility. Instead, air pollution problems typically derive from the collective emissions of many factories, power plants, roads, and other sources.³⁴¹ Those emissions often interact in complex and nonlinear ways.³⁴² Consequently, determining on an ad hoc, project-by-project basis what level of emissions should trigger regulation would be nearly impossible, and the Clean Air Act does not ask anyone to try. It instead compels states to develop "state implementation plans" (SIPs) that address all emission sources, and it only allows approval of plans that simulation models predict will attain the ultimate air quality goal.³⁴³ The contrast to the project-by-project section 7 approach is dramatic.

This comprehensive approach presents several obvious advantages. First, rather than addressing each individual action in an analytical vacuum, it gives planners an opportunity to consider the aggregate

337. Interview with FWS Biologists (Nov. 3, 2010) (stating that the services are "barely keeping our heads above water with section 7 consultations").

338. See CONSULTATION HANDBOOK, *supra* note 76, at 4-31 (noting that in creating a cumulative effects analysis, a Federal action agency must not consider any "[f]uture Federal actions requiring separate consultation").

339. See David M. Theobald et al., *Ecological Support for Rural Land-Use Planning*, 15 ECOLOGICAL APPLICATIONS 1906, 1909 (2005) (explaining the difficulty of finding changes to be significant when each proposed project will cause only a small change). Agency biologists readily acknowledged that adverse modification findings were not encouraged. See Interview with NMFS Biologist (Dec. 7, 2010) ("[Y]ou write this, you're going to have to defend it and support it and come up with an alternative.").

340. Non-attainment zones are areas that do not comply with national ambient air quality standards. See 42 U.S.C. § 7501(2) (2006) (defining "non-attainment area[s]").

341. See *id.* § 7408 (requiring ambient air quality standards for pollutants, "the presence of which in the ambient air results from numerous or diverse mobile or stationary sources").

342. See James D. Fine & Dave Owen, *Technocracy and Democracy: Conflicts Between Models and Participation in Environmental Law and Planning*, 56 HASTINGS L.J. 901, 914, 944-45 (2005) (describing mechanisms of ozone creation).

343. 42 U.S.C. § 7410. For detailed descriptions of this approach, see Arnold W. Reitze, Jr., *Air Quality Protection Using State Implementation Plans—Thirty-Seven Years of Increasing Complexity*, 15 VILL. ENVTL. L.J. 209, 226-41, 268 (2004), and Fine & Owen, *supra* note 342, at 903, 949-62. These SIPs are not the Clean Air Act's exclusive regulatory program; it also relies extensively on technology-based controls.

consequence of all of the actions threatening to cause environmental degradation. Second, it compels them to think through the implications of setting regulatory thresholds at a particular level. If those thresholds are set too high and the modeling is reasonably accurate,³⁴⁴ the model will not predict attainment and the planners must return to the drawing board.³⁴⁵ Third, this approach gives regulators opportunities to develop programs to compensate if they do choose to set regulatory thresholds that exempt some contributors.³⁴⁶ If regulators decide that regulating some low-level emitters is not worth the effort, they can change the stringency of other regulatory programs to compensate for that selective non-coverage. In short, rather than addressing each project's incremental impacts in an analytical vacuum, this approach compels regulators to ask, "How are we going to fit our approach to incremental harms into a larger strategy for achieving the outcome we want?"³⁴⁷

Though the services may never develop an approach as intensive as the SIP process, planning processes already prescribed by other sections of the ESA provide useful starting points. First, ESA section 4 already prescribes recovery plans for listed species.³⁴⁸ That recovery planning creates an opportunity to develop regulatory thresholds and to integrate those thresholds into a broader strategy for recovery.³⁴⁹ Second, and more ambitiously, the services could integrate critical habitat protection into large-scale "habitat conservation plans" (HCPs) prepared pursuant

344. Sometimes it is, and sometimes it is not. See Fine & Owen, *supra* note 342, at 949–62 (describing an unsuccessful monitoring exercise); Dave Owen, *Probabilities, Planning Failures, and Environmental Law*, 84 TUL. L. REV. 265, 282 n.93 (2009) (quoting EPA employees describing some of their models as "very accurate").

345. See Fine & Owen, *supra* note 342, at 914 (noting that the Clean Air Act requires attainment demonstrations as a prerequisite to SIP approval).

346. See *Whitman v. Am. Trucking Ass'ns*, 531 U.S. 457, 470 (2001) ("It is to the States that the CAA assigns initial and primary responsibility for deciding what emissions reductions will be required from which sources.").

347. Many critics allege that this type of comprehensive planning is prone to manipulation and requires more information than regulators realistically can obtain. See, e.g., OLIVER A. HOUCK, *THE CLEAN WATER ACT TMDL PROGRAM: LAW, POLICY & IMPLEMENTATION* 207 (2d ed. 2002) ("[O]ne would not wish the CAA SIP program on one's worst enemy."); Reitze, *supra* note 343, at 362–63, 365 (dismissing the SIP program as a "failure," largely because many areas remain in non-attainment). Both problems are clearly real, and the track record of these planning approaches includes many failures. See, e.g., Fine & Owen, *supra* note 342, at 956–57, 960–62 (discussing a planning process marked by misleading treatment of uncertainties and questionable tweaking of assumptions). But it also includes successes, and some regulators believe their planning approaches have worked reasonably well. See, e.g., Owen, *supra* note 344, at 283 n.101 (noting that EPA employees involved in SIP planning viewed the process as reasonably successful).

348. 16 U.S.C. § 1533(f) (2006) (describing the recovery plan requirements).

349. That shift would significantly change recovery planning, which critics allege has traditionally involved vague plans and modest goals. See, e.g., Federico Cheever, *The Road to Recovery: A New Way of Thinking About the Endangered Species Act*, 23 *ECOLOGY L.Q.* 1, 16 & n.64 (1996).

to sections 9 and 10 of the ESA.³⁵⁰ These plans allow otherwise prohibited “takes” of endangered species so long as the entity responsible for the take is participating in a plan expected to provide a net benefit to the impacted species.³⁵¹ The services could offer the same deal for projects causing small adverse changes to habitat: if the project proponent participates in a broader HCP that will create an overall improvement in habitat conditions, the services would not find adverse modification.³⁵² Though implementing such an approach would be challenging,³⁵³ the benefits might be substantial.³⁵⁴ A coordinated conservation approach could provide much more conservation benefit than many isolated and partial minimization efforts,³⁵⁵ and more extensive enforcement of the adverse modification prohibition could create an important incentive for participation in large-scale HCPs.³⁵⁶

B. *Praising the Complexity*

The preceding discussion suggests what may seem an odd hybrid of regulatory approaches. It would include elements of prohibitory regulation, negotiated feasibility-based standards, trading-based mitigation schemes, and planning-based approaches, all integrated into a system that combines slightly increased centralization with a continued reliance on project-by-project, location-specific regulatory controls. It may seem like an approach developed by indecisively ordering everything on the environmental regulatory menu, notwithstanding years of academic arguments asserting that one or a

350. See 16 U.S.C. § 1539(a)(2)(A) (identifying plan regulations).

351. See Salzman & Ruhl, *supra* note 322, at 648–49 (explaining the program).

352. To be legally tenable, that approach would need to treat participation in the HCP as part of the “action” subject to consultation. I see nothing in the statute that precludes such an approach.

353. HCPs have received mixed reviews in the environmental law literature. See generally Alejandro E. Camacho, *Can Regulation Evolve? Lessons from a Study in Maladaptive Management*, 55 UCLA L. REV. 293 (2007) (criticizing the program, but also summarizing arguments in its favor). But the more critical discussions still suggest that HCPs can be done well). Camacho, for example, criticizes the program primarily for being closed to public participation and scrutiny, but notes that HCPs prepared more openly appear to have produced better results. See *id.* at 317–19.

354. The literature on the potential benefits of HCPs is extensive. Cf. Joseph L. Sax, *Environmental Law at the Turn of the Century: A Reportorial Fragment of Contemporary History*, 88 CAL. L. REV. 2375, 2381 (2000) (explaining potential political benefits); Thompson, Jr., *supra* note 30, at 318–19 (describing potential benefits of HCPs, though also acknowledging that transaction costs have been substantial).

355. See generally Theodore C. Weber & William L. Allen, *Beyond On-Site Mitigation: An Integrated, Multi-Scale Approach to Environmental Mitigation and Stewardship for Transportation Projects*, 96 LANDSCAPE & URB. PLAN. 240 (2010) (describing ways that a coordinated mitigation strategy can outperform site-by-site efforts).

356. Landowner reluctance to participate has been a challenge for large-scale HCPs. See Thompson, Jr., *supra* note 30, at 318.

few of those tools is best.³⁵⁷ But the hybrid nature of the prescribed reforms reflects the services' need, in a world of flawed options, for a regulatory toolbox with multiple tools.³⁵⁸ If a creative and pragmatic agency holds discretion to select from among a variety of approaches, the portfolio of regulatory approaches should be superior to any of its imperfect parts.

That need for regulatory portfolios leads to a broader point about regulating complicated environmental challenges. It is easy to look at our environmental law system, with its "great undigestible masses of statutes . . . interpreted by mounds of regulations, all densely packed with bizarre terms and opaque acronyms,"³⁵⁹ and pine for some simplicity. The sometimes painful, often contentious history of implementing that system only increases the temptation. Surely, one might think, among those approaches (or some waiting to be developed) is a better way, and surely many of the existing approaches are deeply flawed or obsolete and can simply be discarded. But the critical habitat experience suggests that such hopes, while perfectly understandable, may be misplaced. A diversity of regulatory approaches will often be a strength rather than a weakness, for there are elements of wisdom in many of the regulatory approaches would-be reformers sometimes dismiss. And while changes and reforms will still be necessary for environmental law to take on its next generation of challenges, the critical habitat story suggests that some of the changes can be subtle. Rather than scrapping existing regulatory approaches and creating something entirely new, the best reforms may involve doing some modest tinkering with existing incentives and approaches, giving agencies a few new tools to use, and expecting, notwithstanding all the antigovernmental rhetoric of contemporary politics, that those agencies will have the creativity and commitment to put those tools to good use.

CONCLUSION

The listing of the polar bear as a threatened species and the subsequent designation of its critical habitat were not isolated events. Climate change is likely to lead to many other species listings, and dozens of species initially listed for other reasons also face climate change as a major threat.³⁶⁰ Climate change is just one of many major

357. See, e.g., Ackerman & Stewart, *supra* note 326, at 1352 (advocating trading schemes); HOUCK, *supra* note 347, at 411, 445 (advocating feasibility-based controls); Wood, *supra* note 48, at 45–46 (discussing public trust protections).

358. See generally Holly Doremus, *A Policy Portfolio Approach to Biodiversity Protection on Private Lands*, 6 ENVTL. SCI. & POL'Y 217, 217–18 (2003).

359. Carol M. Rose, *Rethinking Environmental Controls: Management Strategies for Common Resources*, 1991 DUKE L.J. 1, 1; see also Wood, *supra* note 48, at 57. To be clear, Professor Rose focuses on making sense of the "undigestible masses," not on developing a simpler regulatory scheme.

360. For just a few of the many possible examples, see Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the Georgia Pigtoe Mussel,

environmental impacts caused by an accumulation of seemingly minor actions.³⁶¹ The central regulatory challenge addressed by this Article is large and continuing to grow.

Current regulatory approaches are only partially equipped to address that challenge. The services have taken substantial steps to address habitat degradation, and their efforts undermine critiques alleging that ESA implementation is characterized by rigid inflexibility or alternatively by regulatory capture. But the empirical record still indicates a substantial gap between statutory requirements and actual performance, and the gap is particularly acute where incremental degradation is occurring. That gap need not be quite so large; tools to address some of those tensions exist and could be exploited with only modest adjustments to existing regulatory systems. The services, and any other regulator seeking to address incremental environmental degradation, can and should take advantage of those opportunities.

Interrupted Rocksnail, and Rough Hornsnail and Designation of Critical Habitat, 75 Fed. Reg. 67,512, 67,523 (Nov. 2, 2010) (to be codified at 50 C.F.R. pt. 17) (identifying climate change as a threat); Endangered and Threatened Wildlife and Plants: Threatened Status for the Puget Sound/Georgia Basin Distinct Population Segments of Yelloweye and Canary Rockfish and Endangered Status for the Puget Sound/Georgia Basin Distinct Population Segment of Bocaccio Rockfish, 75 Fed. Reg. 22,276, 22,282 (Apr. 28, 2010) (to be codified at 50 C.F.R. pts. 223 & 224) (acknowledging climate change as a potentially major threat); Endangered and Threatened Wildlife and Plants: Threatened Status for Southern Distinct Population Segment of Eulachon, 75 Fed. Reg. 13,012, 13,015 (Mar. 18, 2010) (to be codified at 50 C.F.R. pt. 223) (“We also recognize that climate change impact on ocean conditions is likely the most serious threat to persistence of eulachon in all four sub-areas of the DPS . . .”).

361. See *supra* notes 10–13 and accompanying text.

