

A R T I C L E

Critical Habitat and the Challenge of Regulating Small Harms

by Dave Owen

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I. Statutory Requirements for Critical Habitat Protection

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.¹ To those ends, it requires the services to list species that are in danger of extinction² and to designate critical habitat for those species.³ That critical habitat should include both occupied and unoccupied habitat with "physical or biological features . . . essential to the conservation of the species."⁴

Once critical habitat is designated, its protection comes from ESA section 7. Section 7 requires federal agencies taking actions ("action agencies," in ESA terminology) that might adversely affect listed species to consult with the relevant service⁵ and obtain a written report known as a "biological opinion."⁶ 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.⁷ Once the action agency has received a biological opinion, it theoretically has the discretion to follow or to disregard the opinion's recommendations.⁸ In practice, however, action agencies rarely proceed with an action that the services predict will cause adverse modification or jeopardy.⁹ 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.¹⁰ 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.¹¹

The adverse modification prohibition is not the ESA's only regulatory protection for habitat. First, section 7 also precludes federal agencies from performing actions "likely to jeopardize the continued existence of any [listed] species. . . ."¹² This prohibition is implemented through the same consultation process.¹³ The jeopardy analysis should encompass any threat a project poses to listed species, including but not limited to habitat degradation.¹⁴ Second, ESA section 9 makes it unlawful for "any person" to "take" any endangered species.¹⁵ The Act defines "take" broadly, and the Supreme Court has upheld agency regulations that treat some forms of habitat modification as prohibited "takes."¹⁶ 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 10.¹⁷ Federal agencies (and recipients

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1. 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)).
2. See *id.* §1533(a).
3. *Id.* §1533(a)(3).
4. 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).
5. With some exceptions, NMFS holds jurisdiction over marine and anadromous fish species, and FWS holds jurisdiction over terrestrial and freshwater species.
6. 16 U.S.C. §1536(b).

7. *Id.* §1536(a)(2).
8. 50 C.F.R. §402.15(a) (2010).
9. See *Bennett v. Spear*, 520 U.S. 154, 170 (1997).
10. See generally U.S. FISH & WILDLIFE SERV. & NAT'L MARINE FISHERIES SERV., ENDANGERED SPECIES ACT CONSULTATION HANDBOOK (1998) [hereinafter CONSULTATION HANDBOOK].
11. 16 U.S.C. §1536(a)(2) (2006) (imposing obligations on "[e]ach federal agency").
12. 16 U.S.C. §1536(a)(2).
13. CONSULTATION HANDBOOK, *supra* note 10, at 4-33 to -34.
14. See *id.* at 4-23 to -43 (describing the scope of the project impacts analysis).
15. 16 U.S.C. §1538(a)(1) (2006). By regulation, the services have extended these protections to many threatened species. *Id.*
16. *Babbitt v. Sweet Home Chapter of Cmty. for a Great Or.*, 515 U.S. 687, 704-06 (1995).
17. 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*

of permits or funding from federal agencies) may also obtain “incidental take authorization” if they complete the section 7 consultation process and implement the “reasonable and prudent measures” specified in the biological opinion.¹⁸

A. The Combination of Approaches and the Adverse Modification Prohibition’s Potentially Unique Role

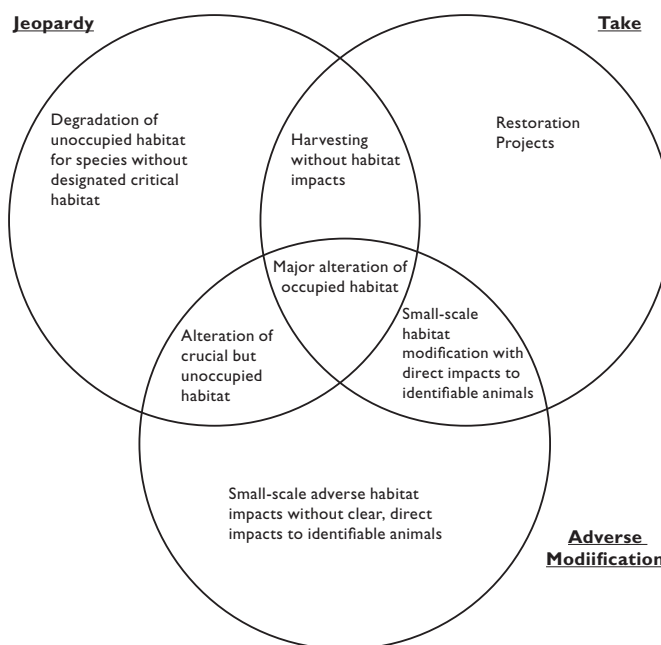
The potential for the take and jeopardy prohibitions to overlap with the adverse modification prohibition is obvious. If a federal agency action is likely to cause major negative impacts to listed species, the jeopardy prohibition should apply, and the critical habitat provisions will simply offer an overlapping layer of protection. Similarly, if an action will lead to clear and discernible impacts to identifiable animals, the take prohibition should apply,¹⁹ and the critical habitat protections again offer a redundant layer of protection. Nevertheless, there would appear, at least on paper, to be circumstances in which the adverse modification prohibition alone would apply.²⁰

The adverse modification prohibition appears to go beyond the jeopardy prohibition in two categories of actions.²¹ 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.²² At least in some circumstances, this is a plausible statutory interpretation.²³ The adverse modification prohibition, by contrast, is more absolute. The statute’s plain language precludes federal agency actions from causing negative changes to critical habitat, even if the change is small.²⁴ Second, some federal actions will adversely modify

habitat but will have uncertain impacts upon species’ survival. Consequently, determining whether an individual project might pose enough risk to create jeopardy can be quite difficult, even if the project clearly will have adverse impacts on critical habitat.²⁵

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. 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.²⁶ In that case, both the majority opinion and Justice O’Connor’s concurrence emphasized the need for a proximate causal relationship between the activity and harm to specific animals. In theory, that relationship might be absent even where harm to critical habitat clearly is occurring, either because species are absent from the action area at the time of the activity or because the action affects habitat but has uncertain causal connections to harm to identifiable animals.²⁷

Figure 1: The ESA’s Prohibitions



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.

Development, 5 ENVTL. L. 345, 345 (1999).

18. *Id.* §1536(b)(4).

19. See *infra* notes 70–71 and accompanying text.

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

21. For a parallel analysis of the relationship between jeopardy and adverse modification, see Houck, *infra* note 67, at 300–01.

22. See CONSULTATION HANDBOOK, *supra* note 10, 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).

23. 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 22, at 137–43 (discussing the services’ shifting approaches to cumulative impact analyses).

24. See 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) (“Backing the tractor over a single salmon redd

is an actionable deed of ‘destruction’ or ‘modification’ if the necessary paperwork is done.”).

25. 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.

26. 515 U.S. 687 (1995).

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

At first blush, these categories of actions to which the adverse modification provision alone applies might seem trivial.²⁸ In actuality, they are probably enormous.²⁹ Whether the threat arises from creeping development or climate change, to provide just two examples, many species are imperiled by the incremental consequences of hundreds, if not thousands, of small habitat modifications. Attributing jeopardy or take to any one individual action could be quite difficult. Consequently, for some of the most extensive threats to species, the adverse modification prohibition seems to be the ESA's primary answer.

II. The Prohibition in Practice

While on paper the adverse modification prohibition appears to be one of the most powerful and far-reaching provisions in environmental law, the law in practice is not always the same as the law on the books. Therefore, to explore actual practices, I pursued a series of inquiries. First, I compiled a database of over 4,000 biological opinions and tracked the frequency of adverse modification and jeopardy findings. Next, I compiled smaller databases of biological opinions for roughly comparable species with and without critical habitat and examined whether a critical habitat designation made any discernible difference in the consultation approach or outcomes. Third, in a series of semi-structured interviews, I asked FWS and NOAA Fisheries staff about their experiences implementing the adverse modification prohibition. Finally, I reviewed court cases considering the adverse modification prohibition. The bullet points and tables below summarize the key findings.

A. Documentary Evidence of Implementation of the Adverse Modification Prohibition

Like several prior studies, I found that jeopardy and adverse modification determinations are very rare. I also found little evidence that a critical habitat designation increased the odds of a negative biological opinion. In fact, my data set did not include a single opinion in which either NMFS or FWS found adverse modification without finding jeopardy.³⁰

28. See, e.g., Barton H. Thompson Jr., *People or Prairie Chickens: The Uncertain Search for Optimal Biodiversity*, 51 STAN. L. REV. 1127, 1141 (explaining why the critical habitat provisions rarely assume independent significance).

29. See generally William E. Odum, *Environmental Degradation and the Tyranny of Small Decisions*, 32 BIOSCIENCE 728, 728 ("Each threatened and endangered species, with a few exceptions, owes its special status to a series of small decisions.").

30. 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

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

	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%

Throughout this table, I used the following short forms: Jeopardy (J); Adverse Modification (AM); Critical Habitat (CH).

In my comparison of subsets of biological opinions, I found no evidence, qualitative or quantitative, that the services were approaching consultation differently in critical habitat areas. In that comparative analysis, I also found that the services routinely declined to find adverse modification even where they anticipated adverse impacts on habitat, and even where they concluded that those adverse habitat impacts would result in takes.

The opinions also indicate *why* the agencies were never finding adverse modification. 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 not—as minor.

B. Documentary Evidence of Alternative Habitat Protection Measures

While the services seemed reluctant to invoke the adverse modification prohibition—this was only half of the story. They were taking steps to protect habitat. Biological opinions 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.³¹ 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

opinions for species with designated critical habitat. The data tables supporting these calculations are available on request from the author.

31. See *infra* Table 2.

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

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%

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

“conservation measures” to similar effect.³² 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.³³ Despite variations in the nature of those conditions and the extent to which they were tailored to specific sites, one common theme emerged: the services expected many of the conditions to provide significant benefits to the species.³⁴ 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.³⁵

C. Interviews

Despite documentary evidence suggesting that the critical habitat prohibition has little relevance, the interviews revealed 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. 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. Many of the biologists thought that a critical habitat designation gave the services more leverage to negotiate habitat conditions. With one exception, 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

32. See, e.g., U.S. Fish & Wildlife Serv., N.M. Ecological Servs., Albuquerque, N.M., Biological Opinion on the Effects of the Tiffany Sediment Plug Removal 5, 27 (2005).

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

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

35. For an exception to this generalization, see 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., at 44–45 (June 25, 2007) (requiring the future development of measures to address the adverse impacts of the project); see also *Ctr. for Biological Diversity v. Salazar*, No. CV 07–484 TUC–AWT,

2011 WL 2160254, at **11–14 (D. Ariz. 2011) (describing, and rejecting as legally insufficient, reliance on uncertain mitigation measures).

Table 3: Summary of Agency Biologist Responses

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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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.

biological opinions. But all of the biologists thought that subtle effects do exist.³⁶

D. 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. I therefore also reviewed all published judicial decisions addressing the adverse modification prohibition, and found the following:

- 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.³⁷

36. The table that follows in the text 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.

37. *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. 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,

- Despite the small overall number of cases, the amount of critical habitat litigation is increasing dramatically, with nineteen of the adverse modification decisions issued in just the last six years.³⁸
- In those cases, courts are giving independent significance to the adverse modification prohibition. This contravenes older assertions that at least in court, the adverse modification prohibition served primarily to bolster the jeopardy prohibition.
- Environmental plaintiffs have won most of the adverse modification cases.
- Courts are unsure how much habitat degradation is too much, and some will allow measurable degradation of critical habitat notwithstanding section 7's prohibition on adverse modification or destruction of that habitat.

III. Critical Habitat and the Challenges of Incremental Degradation

My study presents a mixed view of the services' protection of critical habitat. On the one hand, the services have done little with the adverse modification prohibition, and judicial intervention has been rare. The prohibition does influence some outcomes, but that influence is subtle and by some measures is hard to discern at all. Moreover, the services often decline to find adverse modification even where they clearly anticipate negative effects upon, and even destruction of, critical habitat. But while the services have accorded little weight to the adverse modification prohibition, they are consistently taking steps to protect habitat, and are demanding, and obtaining, modifications of nearly every project that is subject to consultation. Whether those modifications are sufficient, in the aggregate, to help species survive and recover is hard to say, but the services' consis-

tent tolerance of incremental habitat degradation suggests the answer is probably negative. Nevertheless, those modifications clearly provide species with much more protection than would exist in the absence of the ESA.

That mixed picture undercuts two widespread critiques of the ESA. One of these views, which assails the statute's alleged inflexibility, is difficult to reconcile with the agencies' selective non-implementation of an important statutory mandate, and with their preference for negotiating adjustments to projects rather than establishing stark prohibitions. A contrary narrative, in which the ESA is a "paper tiger" weakly implemented by captured regulators, is difficult to reconcile with the extensive habitat protection efforts in which the services are engaged. Both of these narratives often form the basis for calls for comprehensive, even drastic, statutory or administrative reforms. The inaccuracy of these narratives suggests that such drastic reforms may be unnecessary, and that there is much worth preserving in existing implementation approaches.

But that does not mean there is no need for more modest reforms. This part therefore considers adjustments that could improve ESA implementation.

A. The Core 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?³⁹ 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.⁴⁰ 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.⁴¹ 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

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).

38. See *supra* note 37 (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

39. See, e.g., Kevin M. Stack & Michael P. Vandenberg, *The One Percent Problem*, 111 COLUM. L. REV. 1385 (2011) (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).

40. See Kass, *supra* note 39, at 71.

41. 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).

harms, any line will seem somewhat arbitrary.⁴² The distinction is even harder to draw if, as is often the case, no one knows how much harm each action will cause.⁴³

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.⁴⁴ 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.⁴⁵ 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.⁴⁶ 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.⁴⁷ 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, 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. 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 seem premised on the dubious assumption that small harms pose no real threat to species.⁴⁸

The services’ chosen approach also may be insufficiently protective. Recovering species is a core goal of the ESA.⁴⁹ 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, threat⁵⁰—then allowing additional habitat degradation is fundamentally inconsistent with that goal. 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.⁵¹ 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. The discussion below explains two promising possibilities.⁵²

I. Low Thresholds and Offsite Mitigation

While reviewing biological opinions, I found very few uses of offsite mitigation to compensate for onsite environmental impacts.⁵³ 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.⁵⁴ 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

42. 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).

43. See, e.g., *supra* note 40 and accompanying text (discussing the impossibility of linking greenhouse gas emissions from specific activities to specific increments of habitat change).

44. See *supra* note 19 and accompanying text.

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

46. See Holly Doremus, *Scientific and Political Integrity in Environmental Policy*, 86 TEX. L. REV. 1601, 1611, 1628, 1630 (2008) (describing congressional efforts to hamstring ESA implementation).

47. See INDUS. ECON., INC. & N. ECON., ECONOMIC ANALYSIS OF CRITICAL HABITAT DESIGNATION FOR THE POLAR BEAR IN THE UNITED STATES ES-6 (2010) (stating that FWS will not use the polar bear critical habitat designation as a basis for regulating climate change).

48. See, e.g., notes 31-35 and accompanying text.

49. 16 U.S.C. §1531(a)(4) (2006).

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

51. See generally Carol M. Rose, *Environmental Law Grows Up (More or Less)*, and *What Science Can Do to Help*, 9 LEWIS & CLARK L. REV. 273, 279 (2005) (“In focusing on individual actors’ behavior, [behavior-based] measures were inattentive to the fact that even small amounts can add up.”).

52. 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., CHARLES C. MANN & MARK L. PLUMMER, *NOAH’S CHOICE: THE FUTURE OF ENDANGERED SPECIES* 213 (1995) (“[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); 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, 70-71 (2010) (praising the “worthy aspiration” toward a collaborative decision-making model, while subsequently noting the model’s impracticality).

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

approach, let alone provide guidance for its implementation.⁵⁵ Nor do the services track the use of such measures.⁵⁶

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 functional—but will unavoidably harm a small habitat area, a biologist must choose between enforcing the letter of the statute at significant social 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. 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 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. 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. 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. 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.⁵⁷

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. Performing that kind

of broader analysis is likely to be impossible, particularly if agency guidance tells that biologist to ignore many future projects.⁵⁸ 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.⁵⁹

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.⁶⁰ Air pollution problems typically derive from many sources, which interact in complex and nonlinear ways.⁶¹ 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 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.⁶²

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 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,⁶³ the model will not predict attainment and the planners must return to the drawing board.⁶⁴ Third, this approach gives regulators opportunities to develop programs

55. The handbook does mention the possibility of offsite mitigation in its discussion of conservation measures. See CONSULTATION HANDBOOK, *supra* note 10, at 4-19. But the discussion is not at all extensive.

56. See Jessica B. Wilkinson & Robert Bendick, *The Next Generation of Mitigation: Advancing Conservation Planning Through Landscape-Level Mitigation Planning*, 40 ELR 10023, 10034 (Jan. 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.")

57. CONSULTATION HANDBOOK, *supra* note 10, 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 22, at 156 (criticizing this approach as "virtually unworkable").

58. See CONSULTATION HANDBOOK, *supra* note 10, 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").

59. 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.")

60. 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]").

61. 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).

62. 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.

63. Sometimes it is, and sometimes it is not. See James D. Fine & Dave Owen, *Technocracy and Democracy: Conflicts Between Models and Participation in Environmental Law and Planning*, 56 HASTINGS L.J. 901, 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").

64. See James D. Fine & Dave Owen, *supra* note 63, at 914 (noting that the Clean Air Act requires attainment demonstrations as a prerequisite to SIP approval).

to compensate if they do choose to set regulatory thresholds that exempt some contributors.⁶⁵ 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?"⁶⁶

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.⁶⁷ That recovery planning creates an opportunity to develop regulatory thresholds and to integrate those thresholds into a broader strategy for recovery.⁶⁸ Second, and more ambitiously, the services could integrate critical habitat protection into large-scale "habitat conservation plans" (HCPs) prepared pursuant to sections 9 and 10 of the ESA.⁶⁹ 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.⁷⁰ 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. A coordinated conservation approach could provide much more conservation benefit than many isolated and partial minimization efforts, and more extensive enforcement of the adverse modification prohibition could create an important incentive for participation in large-scale HCPs.

IV. Conclusion

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.⁷¹ Climate change is just one of many major environmental impacts caused by an accumulation of seemingly minor actions. 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.

65. 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.").

66. 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 64, 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 63, at 283 n.101 (noting that EPA employees involved in SIP planning viewed the process as reasonably successful).

67. 16 U.S.C. §1533(f) (2006) (describing the recovery plan requirements).

68. 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).

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

70. See James Salzman & J.B. Ruhl, *Currencies and the Commodification of Environmental Law*, 53 *STAN. L. REV.* 607, 648–49 (explaining the program).

71. 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, Interrupted Rocksnail, and Rough Hornsnail and Designation of Critical Habitat*, 75 *Fed. Reg.* 67512, 67523 (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.* 22276, 22282 (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.* 13012, 13015 (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 . . .").