ARTICLE

Climate Change and the Endangered Species Act: Building Bridges to the No-Analog Future

by J.B. Ruhl

J.B. Ruhl is the Matthews & Hawkins Professor of Property at The Florida State University College of Law, Tallahassee, Florida.

I. Introduction

The pika is toast. More specifically, the American pika (*Ochotona princeps*) is running out of places to live,[1] and global climate change appears to be the primary cause of its decline.[2] This tiny rabbit-like species has the unfortunate trait of being remarkably well-adapted to the cold, high-altitude, montane habitat of the Sierra Nevada and Rocky Mountain ranges in the North American Great Basin. The pika's problem is that as global climate change causes surface temperatures to rise, the altitude below which pikas cannot find suitable conditions for survival also is rising.

The pika's recent decline and gloomy future call to mind the protective capacity of the Endangered Species Act (ESA),[3] often referred to as the "pit bull" of environmental laws.[4] The United States Fish & Wildlife Service (FWS), which administers the ESA for terrestrial and freshwater species,[5] has identified over 1250 animal and plant species in the United States for protection and has exercised its regulatory authority throughout the nation to fulfill the statute's goal of conserving imperiled species.[6] The ESA is credited

The author would like to thank Michael Bean, Robin Kundis Craig, Holly Doremus, Don Elliott, Alex Klass, David Policansky, and Katrina Wyman for input on earlier versions of this work, to participants in workshops at Florida State, Georgetown, Virginia, the Department of the Interior, and Defenders of Wildlife for their helpful comments, to my research assistants Nino Chiarello and the late Lucinda Lagomasino, and to the FSU College of Law for financial and other support. Please direct any questions or comments to jruhl@fsu.edu. This Article is excerpted from 88 B.U. L. Rev. 1 (2008) *and is reprinted with permission.*

1. The background on the pika in this paragraph is derived from Donald K. Grayson, *A Brief History of Great Basin Pikas*, 32 J. Biogeography 2103 (2005), and Erik A. Beever et al., *Patterns of Apparent Extirpation Among Isolated Populations of Pikas (Ochotona princes) in the Great Basin*, 84 J. Mammalogy 37 (2003).
2. In this Article, I unapologetically adopt the premise that global climate change is occurring at anomalously rapid rates compared to historical trends, and that anthropogenic (human-induced) sources of greenhouse gases (primarily carbon dioxide) are a significant causal factor. I do not endeavor here to attempt to convince anyone of this. The Intergovernmental Panel on Climate Change (IPCC), an international scientific project representing hundreds of scientists, has produced a series of reports, including a comprehensive set in 2007, synthesizing scientific information on climate change and its effects on ecological conditions, all of which support the premises adopted herein. *See, e.g.*, Intergovernmental Panel on Climate Change, Summary for Policymakers, Climate Change 2007: Impacts, Adaptation, and Vulnerability, Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change 8-10 (2007), *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-spm.pdf [hereinafter Climate Change Impacts Summary] (last visited May 18, 2009); Intergovernmental Panel on Climate Change, Summary for Policymakers, Climate Change 2007: Mitigation, Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change *passim* (2007), *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-spm.pdf (last visited May 18, 2009); Intergovernmental Panel on Climate Change, Summary for Policymakers, Climate Change 2007: The Physical Science Basis, Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change 2-5 (2007), *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf [hereinafter Physical Science Basis Summary] (last visited May 18, 2009); Intergovernmental Panel on Climate Change, Climate Change and Biodiversity, IPCC Technical Paper V 1 (2002), *available at* http://www.ipcc.ch/pdf/technical-papers/climate-changes-biodiversity-en.pdf [hereinafter Climate Change and Biodiversity] (last visited May 18, 2009). *See generally* Intergovernmental Panel on Climate Change, Climate Change 2007 Synthesis Report: Summary for Policy Makers (2007), *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf (last visited May 18, 2009) (summarizing the IPCC's work to date).
3. Endangered Species Act of 1973, 16 U.S.C. §§1531-44, ELR Stat. ESA §§2-18.
4. *See, e.g.*, Steven P. Quarles, *The Pit Bull Goes to School: The Endangered Species Act at 25: What Works?*, 15 Envtl. F. 55, 55 (1998) (discussing the origins of this reputation). *See generally* Steven P. Quarles & Thomas R. Lundquist, *The Pronounced Presence and Insistent Issues of the ESA*, 16 Nat. Resources & Env't 59 (providing additional historical context highlighting the Act's "overbearing statutory certainty").
5. The National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) (also known as NOAA-Fisheries) administers the ESA for most marine species and anadromous fish. My principal focus is on FWS and terrestrial and freshwater species. What is observed in this article about the ESA, however, applies equally to administration of the statute by the NMFS.
6. *See* U.S. Fish & Wildlife Serv., *The Endangered Species Program*, http://www.fws.gov/endangered/ (last visited May 22, 2009) (providing information about the program and highlighting recent stories).

with preventing the vast majority of protected species from ultimate extinction.[7]

Practically speaking, however, what can the ESA do for the pika? The ESA takes a species-specific approach that has proven effective when employed to address discrete human-induced threats that have straightforward causal connections to a species, such as clearing of occupied habitat for development or damming of a river. That is not the pika's situation. Rather, *all* anthropogenic sources of greenhouse gases throughout the planet, from a small farm to a sprawling refinery, are contributing to the demise of the pika, and the species' decline is gradual and largely invisible to human perception. Pikas will not drop dead because of exposure to greenhouse gas emissions—they will just fade away as their habitat transforms below their feet. The ESA has proven to be unwieldy when applied on large working landscape levels,[8] so is there reason to believe it will be any more effective when applied on global levels to this kind of creeping oblivion?

The pika thus serves as an example of the tension global climate change will create in the administration of the ESA and other environmental laws. On the one hand, the case for bringing these and other climate-threatened species under the ESA's protective wings seems as unequivocal as they come. On the other hand, given the reasonably anticipated trajectory of global climate change and its effects on ecosystems, there soon may be no practical way to administer the ESA in its present form for those species.

The ESA is by no means unique in finding itself between a rock and a hard place due to climate change. For example, the U.S. Environmental Protection Agency (EPA) recently denied a citizen rulemaking petition asking the agency to regulate greenhouse gas emissions from motor vehicles as an air pollutant under the Clean Air Act.[9] The agency dismissed the petition on the basis that global climate change is so complicated either Congress did not provide for greenhouse gas emissions to be subject matter for the Clean Air Act or, if Congress did so provide, the agency properly identified conflicting policy concerns as a basis for deciding not to regulate emissions.[10]

But the Supreme Court nipped this kind of reasoning in the bud. In *Massachusetts v. EPA*,[11] a majority of the Court found that the EPA erred in denying the rulemaking petition, making clear the principle that simply because Congress did not have climate change on its mind when it drafted a law does not mean 30 or however many years later the agency responsible for implementing the law can ignore the effects of climate change.[12] Like any other phenomenon that comes along after a statute is enacted, if global climate change becomes relevant to the statutory text and policy, it is fair game, if not *mandatory* fodder, for incorporation into the regulatory program. Hence, the Court concluded, greenhouse gas emissions, because they are linked to climate change and its numerous anticipated ill effects, fit the Clean Air Act's broad definition of an air pollutant.[13]

After *Massachusetts v. EPA*, one can argue it is incumbent on *all* federal regulatory agencies to assess how global climate change is to be integrated into their respective regulatory programs. Evaluating the fit between a regulatory program and climate change, however, often boils down to identifying the scope of discretion an agency has at its disposal with respect to climate change and determining how the agency can legitimately exercise it. The EPA knows now that it must make a decision about the effects of greenhouse gas emissions from motor vehicles and whether to regulate them, but what is the scope of the agency's discretion in making that decision? That is the question the Court in *Massachusetts v. EPA* left for the EPA to answer under the Clean Air Act[14] and the question this article explores from the perspective of the ESA as presently constituted.[15] Many ecologists believe we face a no-analog future—one for which we have no experience on which to base projections of ecosystem change[16] and for which models designed to allow active management decisions as climate change takes effect are presently rudimentary and imprecise.[17]

I propose a coherent game plan for the FWS based on four assumptions: (1) even with swift and effective adoption of global-wide greenhouse gas emission mitigation measures, some residual climate change will continue to occur over the next 50 years[18]; (2) realistically, global-wide mitigation measures will not entirely reverse greenhouse gas emissions to 1990 levels; but (3) mitigation measures will stabilize emis-

7. *See* J. Michael Scott et al., *By the Numbers*, *in* The Endangered Species Act at Thirty 16, 29-32 (Dale D. Goble et al. eds., Island Press 2006) (discussing measures of success).
8. *See* A. Dan Tarlock, *The Dynamic Urban Landscape*, *in* The Endangered Species Act at Thirty, *supra* note 7, at 127, 127-32; Barton H. Thompson Jr., *Managing the Working Landscape*, *in* The Endangered Species Act at Thirty, *supra* note 7, at 101, 104-26.
9. 42 U.S.C. §§7401-7671q, ELR Stat. CAA §§101-618. *See* Control of Emissions From New Highway Vehicles and Engines, 68 Fed. Reg. 52922, 52922 (Sept. 8, 2003) (denying petition requesting EPA regulation of certain GHG emissions from new motor vehicles and engines under CAA).
10. *Id.* at 52929-31.
11. 549 U.S. 497, 37 ELR 20075a (2007).
12. *Id.* at 532-34. *See generally* Arnold W. Reitze Jr., *Controlling Greenhouse Gas Emissions From Mobile Sources*—Massachusetts v. EPA, 37 ELR 10535 (July 2007) (summarizing the rulemaking petition, EPA decision, federal court proceedings, and effects of the case); Michael Sugar, Massachusetts v. Environmental Protection Agency, 31 Harv. Envtl. L. Rev. 531 (2007) (commenting on the case and providing additional background material).
13. *Massachusetts*, 549 U.S. at 527-30. The Clean Air Act defines "air pollutant" in sweeping terms to include "any air pollution agent . . . including any physical, chemical [or] biological . . . substance or matter which is emitted into or otherwise enters the ambient air." 42 U.S.C. §7602(g), ELR Stat. CAA §302(g). The Court found that "greenhouse gases fit well within [this] capacious definition." *Massachusetts*, 549 U.S. at 532.
14. *See Massachusetts*, 549 U.S. at 534-35 ("We need not and do not reach the question whether on remand EPA must make an endangerment finding, or whether policy concerns can inform EPA's actions in the event that it makes such a finding.").
15. This Article addresses the scope of agency discretion under existing statutory provisions. Although the article examines potential rulemaking reforms within the scope of existing statutory authority, I neither suggest nor review proposed statutory reforms of the ESA or any other statute to respond to climate change.
16. *See* Douglas Fox, *Back to the No-Analog Future?*, 316 Science 823, 823 (2007); Douglas Fox, *When Worlds Collide*, Conservation, Jan.-Mar. 2007, at 28.
17. *See* Peter Cox & David Stephenson, *A Changing Climate for Prediction*, 317 Science 207, 207 (2007). For more on these modeling difficulties, see *infra* Part II.A.
18. *See* Richard A. Kerr, *How Urgent Is Climate Change?*, 318 Science 1230, 1230 (2007) ("The system has built in time lags. Ice sheets take centuries to melt after a warming. The atmosphere takes decades to be warmed by today's greenhouse gas emissions.").

sions at a level which will allow global climate regimes eventually to settle into a "natural" pattern of variation; and (4) some species will not survive the transition from the present to that future no matter what actions the FWS takes under the ESA, but others can make it if we help them through the transition. Under these assumptions, I argue that the FWS should *not* attempt to use the ESA to combat greenhouse gas emissions or save all species threatened by climate change, but rather should use it as the bridge to the no-analog future for those species that can benefit from the ESA's helping hand.

II. Climate Change as an Agent of Ecological Reshuffling

The ESA is a change-management law designed to arrest change in one direction—the decline of a species—and bring about a new trajectory of change—recovery of the species. FWS administers several core programs that provide the regulatory firepower needed to effectively intervene in four categories of environmental change that cause species decline: (1) "the present or threatened destruction, modification, or curtailment of" habitat; (2) "overutilization for commercial, recreational, scientific, or educational purposes;" (3) "disease or predation;" and (4) "other natural or manmade factors."[19]

- Section 4 authorizes FWS to identify "endangered" and "threatened" species, known as the listing function,[20] and then to designate "critical habitat"[21] and develop "recovery plans" [22] for the species.
- Section 7 requires all federal agencies to "consult" with FWS to ensure that actions they carry out, fund, or authorize do not "jeopardize" the continued existence of listed species or "adversely modify" their critical habitat.[23]
- Section 9 requires that all persons, including all private and public entities subject to federal jurisdiction, avoid committing "take" of listed species of fish and wildlife.[24]
- Sections 7 (for federal agency actions)[25] and 10 (for actions not subject to §7)[26] establish a procedure and criteria for FWS to approve "incidental take" of listed species.[27]

Of course, this authority is only useful in circumstances where intervention is feasible and to the extent it is effective.

In this respect climate change presents a complicated scenario. First, regulating emissions in the United States alone is highly unlikely to be sufficient to reduce global emission levels. Second, even if regulatory measures are implemented worldwide to curtail emissions, the political reality is that they will impose phased-in reductions taking several decades to return to benchmark emission levels designed to stabilize or reduce greenhouse gas concentrations in the troposphere. Most significantly, however, even if benchmark levels are attained in the near future, the physical dynamics of greenhouse gas effects on climate are such that climate change will continue on its present trajectory for a significant time period.[28]

A. *Feedback, Nonlinearity, and Reshuffling—Facing a No-Analog Future*

Three metrics drive much of the discussion of climate change as a *global* phenomenon: rising tropospheric carbon dioxide levels as a causal agent, escalating mean global surface temperatures, and rising sea levels.[29]The cause and effect relationships at this level are fairly well understood: carbon dioxide and other greenhouse gases trap heat radiating from the earth's surface, which causes surface level temperatures to rise, which in turn causes polar and glacial ice to melt and ocean water volume to expand, which cause sea levels to rise.[30]

Of course, what matters for most regulatory agencies is not how well we predict global trends such as surface temperature and sea levels, but what happens at the sub-global regional and local levels at which agencies act. For the FWS it often will be the case that what matters for a particular species is primarily a function of local ecological conditions and their effects on the species. The FWS, in other words, has to find models that predict the effects of global climate warming on a wide range of physical and biological cycles, "downscale" those effects to local ecological conditions, and then evaluate the effects of those local changes on the species of concern.

The FWS has no model of this sort at its disposal because nobody has the experience or knowledge upon which to base them. Ultimately, moreover, such models may simply be beyond our capacity. Although all ecosystems undergo disturbance regimes such as flood, fire, and drought, ecologists understand that these forms of disturbance are part of the stable disequilibrium of resilient, dynamic ecosystems.[31] Cli-

19. 16 U.S.C. §§1533(a)(1)(A)-(E), ELR Stat. ESA §§4(a)(1)(A)-(E) (enumerating the factors by which endangered and threatened species are identified).
20. *Id.* §1522(a)(1).
21. *Id.* §1533(a)(3).
22. *Id.* §1533(f).
23. *Id.* §1536(a)(2).
24. *Id.* §1538(a)(1).
25. *Id.* §1536(b)(4).
26. *Id.* §1539(a)(1).
27. "Incidental take," although not explicitly defined in a specific statutory provision, is described in §10 of the statute as take that is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." *Id.* §1539(a)(1)(B). FWS has adopted this meaning in regulations implementing §7's incidental take authorization. 50 C.F.R. §402.02 (2003).
28. *See* Climate Change Impacts Summary, *supra* note 2, at 19 ("Past emissions are estimated to involve some unavoidable warming . . . even if atmospheric greenhouse gas concentrations remain at 2000 levels").
29. *See* Stefan Rahmstorf et al., *Recent Climate Observations Compared to Projections*, 316 Science 709, 709 (2007) (presenting climate trends and comparing them to previous projections).
30. *See* Physical Science Basis Summary, *supra* note 2, at 10-17 (covering this causal chain, as well as other primary and secondary drivers, both natural and anthropogenic).
31. *See generally* Panarchy: Understanding Transformation in Human and Natural Systems (Lance H. Gunderson & C.S. Holling eds., 2002) (covering

mate change does not represent a mere disturbance regime, the operations of which we can extrapolate from current ecological knowledge; rather, it will be the undoing of ecosystems as we know them.[32]

B. A Typology of Climate Change Threats to Species

Although accurate prediction of climate change effects on local ecological conditions is for now (and perhaps always will be) beyond the capacity of ecological models, a taxonomy of effects can be constructed and may be useful for evaluating where the ESA can be employed most effectively when climate change threatens the continued existence of a species.[33]

1. Primary Ecological Effects

The pika presents a relatively straightforward scenario of climate-induced species decline—the ecological conditions it needs for survival do not exist below a particular temperature regime. They do not have the option of relocating once the temperature regime lifts above the peaks which they now call home.[34] Rather, the pika and other species with specific ecological needs and limited migration capacity are likely to face significant threats from this kind of first order change in ecological conditions. Threats in this category will come from stranding,[35] life-stage habitat loss,[36] and altered biological events.[37]

2. Secondary Ecological Effects

Not all species will find it necessary and possible to depart their current ecosystems in order to withstand the direct effects of climate change, but many will. Others will stay to fight it out. While humans might cheer these species on, the aggregate effects of ecological disruption and species reshuffling are likely to lead to several secondary threats, including increased stress,[38] successful adaptive migration,[39] and opportunistic invasion.[40]

3. Human Adaptation Impacts

Just as the primary threats to species before climate change centered around human-induced ecological change, it is likely that human adaptation to climate change will play a leading role in threatening species. Human adaptation impacts in the form of direct habitat conversion,[41] degraded ecological conditions,[42] and induced invasions[43] will present the most pernicious of such threats.

III. The Impact of Climate Change on the ESA

A. Reshuffling the Regulatory Landscape

The ESA instructs the FWS to use the regulatory powers it confers on the agency to "provide a means whereby the ecosystems upon which endangered and threatened species depend may be conserved."[44] While preserving ecosystems is clearly the statute's primary goal, how precisely to use the agency's regulatory discretion to "provide a means" of achieving the goal is not self-evident from the text of the statute. Add to that the presence of secondary goals sprinkled throughout the statute, such as the command that the FWS "shall cooperate with State and local agencies to resolve water resource issues in concert with conservation of endangered species"[45] and that designation of critical habitat must take "into consideration the economic impact, the impact on national security, and any other relevant impact"[46] and the agency is confronted with yet another layer of policy balanc-

disequilibrium and resilience theories of ecosystem dynamics).

32. *See* Climate Change Impacts Summary, *supra* note 2, at 8 ("The resilience of many ecosystems is likely to be exceeded this century by an unprecedented combination of climate change, associated disturbances (e.g., flooding, drought, wildfire, insects, ocean acidification), and other global change drivers (e.g., land use change, pollution, overexploitation of resources).").
33. All of the impact categories covered in my typology have been discussed to one extent or another in scientific literature. *See, e.g.*, Climate Change and Biodiversity, *supra* note 2, at 16-23. My arrangement of them is designed to coincide with the legal analysis of the ESA covered *infra* Parts III-V.
34. Of course, humans have the option of moving pikas to new locations. I take up the issue of "assisted migration" below. *See infra* Part IV.D.2.
35. *See, e.g.*, Climate Change and Biodiversity, *supra* note 2, at 22 (discussing lifestyle-changing effects of climate change in various ecosystems).
36. *See, e.g.*, *id.* at 17-18 (explaining the varying global effects of increasing temperatures).
37. *See, e.g.*, *id.* at 12 (listing observed changes in the timing of biological events).
38. *See, e.g.*, , *id.* at 13-14 (explaining that coral bleaching, widespread in the late 1990s, is a sign of ecological stresses like pollution and disease).
39. *See, e.g.*, *id.* at 17 (discussing the challenges of species community reorganization and regional limitations imposed by changing temperatures on land and at sea).
40. *See, e.g.*, *id.* at 16-17 (outlining how climate change can drive complicated, uneven changes in habitat and ecosystem characteristics).
41. Many human communities are likely to find it necessary and possible to migrate to avoid rising sea levels along coastal areas, to relocate agricultural land uses, and to obtain secure water supplies. These migrations will necessarily involve some conversion of land uses in areas that presently provide suitable ecological conditions for particular species, in some cases at scales sufficient to pose a threat to the species. *See id*. at 3-4 (discussing some environmental effects of climate-motivated human migration).
42. *See id.* at 43 (examining effects of new adaption strategies on ecosystems).
43. Human adaptation to climate change is likely to involve spatial relocations, as well as increased flow of goods to new settlement areas, which as in the past are likely to introduce non-native species to local ecosystems, some of which will establish successfully. The EPA has suggested that "important progress has been made in identifying climate change effects on invasive species, but . . . our understanding of effects on specific species and interactions of other stressors needs to be improved." Effects of Climate Change on Aquatic Invasive Species and Implications for Management and Research, 72 Fed. Reg. 45046, 45047 (Aug. 10, 2007) (notice of availability of research report and public comment period). Most invasive species introductions are human-induced. Peter M. Vitousek et al., *Biological Invasions as Global Environmental Change*, 84 Am. Scientist 468, 468.
44. 16 U.S.C. §1531(b), ELR Stat. ESA §2(b).
45. *Id.* §1531(c)(2).
46. *Id.* §1533(b)(2).

ing. A third important driver of policy discretion under the ESA has for decades been the background social, economic, and legal context within which the statute is situated. The ESA's "pit-bull" reputation has come at some cost, as the statute is often portrayed as unduly interfering with property rights, susceptible to unscientific agency biases, and riddled with irrational fiscal outcomes.

Climate change does not fit into one of the familiar policy realms, affecting the policy balance by operating from within the existing set of trade offs. Rather, climate change operates on all three realms at once, disrupting not only the contents of each, but also how the trade-off dynamics between each realm play out.

B. Focal Points for Policy Choices

No provision of the ESA addresses pollutants, emissions, or climate in any specific, regulatory sense. Far from insulating the FWS from the need to test the range of its discretion, however, the general nature of the ESA will thrust the FWS into six key policy quagmires.

Identifying Climate-Threatened Species. As no regulatory authorities of the ESA operate until a species is listed as endangered or threatened under §4 of the ESA, the initial pressure point is how the FWS uses available science to determine the effects of climate change on particular species.

Regulating Greenhouse Gas Emissions. If the FWS identifies climate change as a basis for designating a species for protection under the ESA, it inevitably will face the question whether federal actions that cause, fund, or authorize greenhouse gas emissions jeopardize the species under §7, and whether any person emitting greenhouse gases is taking the species in violation of §9.

Regulating Non-Climate Effects to Protect Climate-Threatened Species. Regardless of how aggressively the FWS attempts to regulate greenhouse gas emissions to protect a climate-threatened species, it inevitably will face the problem of how aggressively to regulate other actions that injure the species but which do not contribute to climate change, such as habitat conversion, water diversion, and pollution.

Designing Conservation and Recovery Initiatives. As the FWS regulates more activities associated with climate-threatened species, it inevitably will face the need to design conservation measures as conditions for approval of incidental take under §§7 and 10, as well as the need to formulate recovery measures for the species under §4.

Species Trade Offs. As noted above, the ESA depends on an overriding purpose of "provid[ing] a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved."[47] Yet the reshuffling of species under climate change conditions will make it difficult to identify "the ecosystems" to be conserved and is likely to pit species against species in a manner unprecedented in nature and under the ESA.[48]

Dealing with the Doomed. Perhaps the most confounding question for the FWS will be how to respond with respect to species that appear doomed because of lack of migratory and adaptive capacity to withstand climate change effects in their natural habitat range.

IV. Fitting Agency Discretion With Climate Change

The six policy choices outlined above should guide the extent of the agency's discretion in the listing programs found in §4 of the statute, in the three regulatory programs—the take prohibition, the jeopardy consultation program, and the HCP permit program—and under the statute's pervasive "best scientific data available" standard for decision making.

A. Section 4: Listing, Critical Habitat, and Recovery Plans

Section 4 establishes a package of programs aimed at identifying imperiled species: (1) the listing function, through which such species are identified as endangered or threatened; (2) the designation of critical habitat essential for the survival of such species; and (3) a planning function designed to identify the steps needed for their recovery. Each program presents the FWS with junctures of narrow and broad discretion with respect to climate change.

1. Identifying Species

Section 4(a)(1)[49] of the ESA provides a definitive mandate to the FWS to consider the effects of greenhouse gas emissions and climate change on species. Like the EPA under the Clean Air Act, the FWS seems stuck with the challenge of identifying which species are endangered or threatened partly or primarily because of climate change. The FWS likely has considerable play in terms of matching different climate change threat scenarios with the ESA's endangered-threatened-not threatened matrix. Some species may present such compel-

47. *Id.* §1531(b).

48. National Research Council, Science and the Endangered Species Act 111-23 (1995). Obviously, species naturally compete with one another, such as for habitat and food, or conflict as predator and prey. There are also a number of examples in which conservation measures taken to benefit a species protected under the ESA pose adverse effects for other species protected under the ESA or for other species generally. *See* William W. Kinsey, Zalaphus *(Sea Lion) and* Oncorhynchus *(Salmon/Steelhead): Protected Predator Versus Protected Prey*, 22 Nat. Resources & Env't 36 (Fall 2007) (providing a detailed case study of such a conflict in its legal context).

49. Requiring the agency to "determine whether any species is an endangered species or a threatened species because of any of the following factors:
(A) the present or threatened destruction, modification, or curtailment of its habitat or range;
(B) overutilization for commercial, recreational, scientific, or educational purposes;
(C) disease or predation;
(D) the inadequacy of existing regulatory mechanisms;
(E) other natural or manmade factors affecting its continued existence."
16 U.S.C. §1533(a)(1), ELR Stat. ESA §4(a)(1). The statute also requires that the FWS "shall make determinations required by subsection (a)(1) of this section solely on the basis of the best scientific and commercial data available to him after conducting a review of the status of the species." *Id.* §1533(b)(1)(a). For a discussion of the "best scientific data available" standard, see *infra* Part IV.E.

ling cases of climate change threat that even aggressive use of discretion could not support a decision not to list, but many will present more ambiguous scenarios.

Another source of discretion in the listing function rests in §4(d).[50] When animal species are listed as endangered, the "take" prohibition of §9 applies automatically and fully, leaving less discretion to the FWS as to how to regulate activities that might cause take of the species. By contrast, under §4(d) the FWS has the discretion to prescribe the level of take protection afforded species listed as threatened.[51] This option may allow the FWS to identify and regulate the specific effects of human adaptation to climate change that pose significant obstacles to the survival and recovery of a species, whereas broad, dispersed actions such as greenhouse gas emissions could be entirely excluded from regulation. Of course, the success of this strategy depends on a scientifically credible basis for designating the species as threatened.

2. Designating Critical Habitat

Section 4(a) of the ESA also requires that, "to the maximum extent prudent and determinable [the FWS] shall, concurrently with making a determination under paragraph (1) that a species is an endangered species or a threatened species, designate any habitat of such species which is then considered to be critical habitat."[52] To the extent downscale models can predict with reasonable certainty where a species might successfully migrate to adapt to changes brought about by climate change, a credible interpretation of the critical habitat provisions would allow the agency to "reserve" those areas through critical habitat designations. This would provide an effective tool to force human adaptation measures to minimize effects in such areas, thus securing a greater chance for the species to withstand climate change transitions and establish a viable population in its new ecological home.

On the other hand, several provisions also open the door to a more passive approach. For example, the agency could justifiably conclude that designation of critical habitat for species doomed by climate change fails to meet the "prudent" standard, as the designation will provide no benefit.[53] Indeed, for a doomed species arguably there is no habitat "essential to the conservation of the species," as conservation of the species is not possible.

3. Formulating Recovery Plans

Section 4(f) of the ESA requires the FWS to "develop and implement plans (. . . 'recovery plans') for the conservation and survival of endangered species and threatened species listed pursuant to this section, unless [FWS] finds that such a plan will not promote the conservation of the species."[54] The agency must also "give priority to those endangered species or threatened species, without regard to taxonomic classification, that are most likely to benefit from such plans, particularly those species that are, or may be, in conflict with construction, development projects, or other forms of economic activity."[55] Arguably, this prioritization mandate speaks directly to climate-threatened species which, perhaps only with the help of the ESA, could survive the transition to stabilized climate regimes. On the other hand, one striking aspect of the recovery plan program is that it specifically relieves the FWS of any duty to prepare a plan if the agency finds that "a plan will not promote the conservation of the species."[56] For a species essentially doomed by climate change through stranding or other extreme effects, the FWS could justifiably reach such a finding and avoid expending agency resources developing a plan for the species. For other species, recovery plans can help motivate and guide state, local, and private collaborative efforts to respond to the effects of climate change on those species.[57] Through recovery plans, the FWS may also be able to influence how climate change effects are viewed for species in the regulatory programs of the ESA—the take prohibition, the jeopardy consultation program, and the HCP permit program.

B. Section 9: The Take Prohibition

Section 9(a)(1) of the ESA instructs that, except as provided elsewhere in the ESA,[58] "with respect to any endangered species of fish or wildlife . . . it is unlawful for any person subject to the jurisdiction of the United States to . . . take any such species within the United States or the territorial sea of the United States."[59] The prohibition applies "within the United States," on public and private lands alike. And it applies to acts that "harass, harm, pursue, hunt, shoot, wound, kill,

50. "Whenever any species is listed as a threatened species pursuant to subsection (c) of this section, the Secretary shall issue such regulations as he deems necessary and advisable to provide for the conservation of such species. The Secretary may by regulation prohibit with respect to any threatened species any act prohibited under §1538(a)(1) of this title, in the case of fish or wildlife, or §1538(a)(2) of this title, in the case of plants, with respect to endangered species . . . ." 16 U.S.C. §1533(d), ELR Stat. ESA §4(d).
51. *See* Madeline June Kass, *Threatened Extinction of Plain Vanilla 4(d) Rules*, 16 Nat. Resources & Env't 78, 79-81.
52. 16 U.S.C. §1533(a)(3)(A), ELR Stat. ESA §4(a)(3)(A). The statute defines critical habitat as:
    (i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 1533 of this title, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and
    (ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 1533 of this title, upon a determination by the [FWS] that such areas are essential for the conservation of the species. *Id.* §1532(5)(A).
53. The statute does not define "prudent." According to FWS regulations, designation of critical habitat is not prudent if it "would not be beneficial to the species." 50 C.F.R. §424.12(a)(1)(ii) (2006). No phenomenon operating on the scale of climate change has been the subject of agency decision under this standard.
54. 16 U.S.C. §1533(f)(1), ELR Stat. ESA §4(f)(1).
55. *Id.* §1533(f)(1)(A).
56. *Id.* §1533(f)(1).
57. *See, e.g.*, Proposed Recovery Plan for the Evolutionarily Significant Unit (ESU) of the Puget Sound Chinook Salmon, 70 Fed. Reg. 76445, 76447 (proposed Dec. 27, 2005) (stating that integration of climate change effects in the recovery plan can "support recovery actions to protect and restore local habitat conditions as a buffer against larger-scale changes").
58. The incidental take permitting program is one such exception. *See infra* Part IV.D.1.
59. 16 U.S.C. §1538(a)(1), (a)(1)(B), ELR Stat. ESA §9(a)(1), (a)(1)(B).

trap, capture, or collect" the protected species.[60] Enforcement of the take prohibition in discrete, identifiable actions that make it less likely a climate-threatened species will survive through the climate change transition could help ensure that human adaptation measures do not disregard the interests of imperiled species.

C. *Section 7: Jeopardy Consultations*

Section 7(a)(2) of the ESA provides for jeopardy consultations.[61] The statute builds an elaborate procedure for carrying out these consultations under which the agency proposing the action must "consult" with the FWS through a series of steps designed to predict the impact of the action on listed species, with the ultimate product being a "biological opinion" from the FWS "setting forth the [FWS'] opinion, and a summary of the information on which the opinion is based, detailing how the agency action affects the species or its critical habitat."[62] FWS has issued no official guidance on climate change with respect to the §7 jeopardy consultation program, but in *Natural Resources Defense Council v. Kempthorne*,[63] the court evidenced little tolerance[64] for the FWS' failure to consider climate change in a consultation report. [65] The effect of *Kempthorne* is to require that where downscale modeling and field observations indicate it is "reasonably certain" that climate change will lead to changes in ecological conditions to the detriment of a protected species, the FWS *must* engage in a consultation to determine whether the project, taking those changes into account as cumulative effects, is "reasonably expected" to jeopardize the species. The FWS may in many cases point to the difficulty of downscaling climate change effects to support a no jeopardy finding, but that does not absolve it of the duty to conduct the analysis.

D. *Section 10: Incidental Take Permits and Experimental Populations*

1. Adaptive Management Provisions of Incidental Take Permits

Section 10(a) of the ESA establishes a procedure under which the FWS may approve take of listed species otherwise prohibited under §9 for actions that are incidental to otherwise lawful actions and not subject to the §7 jeopardy consultation process.[66] To seek approval, an applicant must submit a habitat conservation plan (HCP), describing the project and its impact on the species.[67] The agency must then find that the HCP ensures that "the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking" and that "the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild."[68] If the FWS took the great leap of characterizing greenhouse gas emissions as causing take of climate-threatened species under §9, the agency could assert that applicants must reduce or offset greenhouse gas emissions to satisfy this demand, using the "maximum extent practicable" standard to moderate what is expected.

Another wrinkle of the HCP program arises under the so-called No Surprises policy for HCP permits. Under this controversial process, a permittee is relieved of the need to address "unforeseen circumstances" but must agree to manage and respond to the effects of "changed circumstances" identified in the permit documents.[69] To the extent such changed circumstances are provided for in the HCP's operating conservation program, the permittee must implement the appropriate measures in response to the changed circumstances.[70]

The FWS has not directly addressed the issue of how climate change and greenhouse gas emissions play out under the unforeseen circumstances/changed circumstances

60. *Id.* §1532(19).
61. "Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency ('agency action') is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined . . . to be critical . . ." *Id.* §1536(a)(2). The provision also requires that "[i]n fulfilling the requirements of this paragraph each agency shall use the best scientific and commercial data available." *Id.* For discussion of the "best scientific data available" standard, see *infra* Part IV.E.
62. *Id.* §1536(b)(3)(A).
63. 506 F. Supp. 2d 322 (E.D. Cal. 2007).
64. *Id.* at 369-70.
    > [T]he climate change issue was not meaningfully discussed in the biological opinion, making it impossible to determine whether the information was rationally discounted because of its inconclusive nature, or arbitrarily ignored . . . . The BiOp does not gauge the potential effect of various climate change scenarios on Delta hydrology. Assuming, *arguendo*, a lawful adaptive management approach, there is no discussion when and how climate change impacts will be addressed, whether existing take limits will remain, and the probable impacts on CVP-SWP operations. FWS acted arbitrarily and capriciously by failing to address the issue of climate change in the BiOp.
65. Reminiscent of EPA's position in *Massachusetts v. EPA*, the FWS attempted to defend its failure to consider climate change at all, as the court summarized:
    > Defendants and Defendant-Intervenors respond by arguing (1) that the evidence before FWS at the time the BiOp was issued was inconclusive about the impacts of climate change; and (2) that, far from ignoring climate change, the issue is built into the BiOp's analysis through the use of [saline water condition data] as a proxy for the location and distribution of Delta smelt.

    Id. at 369.
66. *See generally* Robert D. Thornton, *Habitat Conservation Plans: Frayed Safety Nets or Creative Partnerships?*, 16 Nat. Resources & Env't 94 (2001) (providing a concise, comprehensive overview of the structure, history, and policy of the HCP program). Actions that must track through the jeopardy consultation process can receive incidental take authorization in connection with the consultation pursuant to "reasonable and prudent measures that [FWS] considers necessary and appropriate to minimize such impact." *See* 16 U.S.C. §1536(b)(4)(ii), ELR Stat. ESA §7(b)(4)(ii).
67. 16 U.S.C. §1539(a)(2)(A), ELR Stat. ESA §10(a)(2)(A).
68. *Id.* §1539(a)(2)(B)(ii), (iv).
69. *See* Habitat Conservation Plan Assurances ("No Surprises") Rule, 63 Fed. Reg. 8859 (Feb. 23, 1998) (codified at 50 C.F.R. §§17.22, 17.32 (2006)). Under No Surprises, the FWS provides participants in an approved, properly implemented HCP the assurance that the Service will not impose additional mitigation requirements in the event that unforeseen circumstances occur over time that negatively impact the species. Unforeseen circumstances means changes in circumstances affecting a species or geographic area covered by an HCP that could not reasonably have been anticipated by plan developers and the Service at the time of the plan's negotiation and development, and that result in a substantial and adverse change in the status of the covered species. *See* 50 C.F.R. §17.22(b)(5)(iii); *see* 50 C.F.R. §17.3.
70. 50 C.F.R. §17.22(b)(5)(i).

dichotomy. In the preamble to the rule as adopted in 1998, however, FWS responded to comments raising the topic.[71] By incorporating a "reasonably foreseeable" standard, the FWS opened the door to the same kind of framework the *Kempthorne* court adopted for consultations under §7(a)(2): the FWS *must* consider climate change when evaluating an HCP, and from there any reasonably foreseeable ecological effects should be taken into account under the changed circumstances category, not the unforeseen circumstances category.

2. Assisted Migration Through Experimental Populations

The agency appears to have the authority to engage in assisted migration: Section 10(j) of the ESA allows the FWS to transport and release members of an endangered or threatened species to areas outside its current range as an "experimental population," if the agency "determines that such release will further the conservation of such species."[72] A species losing habitat within its current and historic range because of climate change effects, but which at the same time is gaining habitat outside its historic range because of climate change, appears to fit these conditions, though there is no instance in which the FWS (or the National Marine Fisheries Service (NMFS)) has exercised this option with respect to a species listed under the ESA because of threats resulting from climate change.

E. The Ubiquitous "Best Science" Standard

The ESA's answer to its necessary dependence on scientific information is the so-called best scientific data available standard, which permeates several of the statute's major programs. Although the ESA leaves this "best scientific data available" standard of evidentiary quality undefined,[73] the standard acknowledges that the FWS is the expert science agency when it comes to defining threats to species and the measures needed for conservation of species.[74] Hence, while the FWS is not the nation's expert science agency on the physical causes and consequences of climate change, it should be responsible for being the repository of knowledge and research on the biological effects of climate change on species. After *Massachusetts v. EPA*, the FWS, like any other regulatory agency, would be hard-pressed to hide behind "scientific uncertainty" to take the position that species are not threatened by climate change and thus the ESA triggers no agency responsibilities.

IV. Using the ESA to Carry Species to the No-Analog Future

The ESA will be best served if the FWS adopts a cautious optimism that recognizes the limits of the ESA but keeps it relevant. The job of the ESA is to help as many species as is reasonably possible get there with us—to serve as their bridge across the climate change transition into the no-analog future. Going for the jugular by regulating greenhouse gas emissions is *not* where the ESA can be of most help to imperiled species. There is little to be gained for the FWS or for climate-threatened species by having the agency go down this road. The agency has no explicit authority to do so, does not have the expertise to do so, and would risk undermining the political viability of the ESA by doing so. Rather, the FWS can provide expert assistance to the agencies more appropriately charged with regulating greenhouse gas emissions, such as the EPA, by advising them about the effects of climate change on species.[75]

This brings us to the six policy choice pressure points raised in Part III. To implement the proposed bridge policy, I suggest the FWS approach the policy choices as follows:

Identifying Climate-Threatened Species. The agency's objective should be to use the ESA to define and monitor the ecological reshuffling effects of climate change. The agency should aggressively identify species threatened by climate change. Early identification of species threatened by climate change and of the critical habitat they require for survival through climate change transition will help in defining the extent of ecological reshuffling and guide human adaptation programs. Early identification also will provide the basis for listing species as threatened, which provides more flexibility in terms of regulatory effects and recovery efforts.

Regulating Greenhouse Gas Emissions. The agency's objective should be to not squander agency resources in a futile effort for which the ESA is simply not equipped; specifically, the FWS should not attempt to use its §7 and §9 regulatory programs in an effort to regulate greenhouse gas emissions.

---

71. Arguing that "only reasonably foreseeable changes in circumstances need to be addressed in an HCP. Moreover, these circumstances are likely to vary from HCP to HCP given the ever changing mix of species and affected habitats covered by a given plan . . . .[U]nforeseen circumstances will only include events that could not reasonably have been anticipated. *All reasonably foreseeable circumstances, including natural catastrophes that normally occur in the area, should be addressed in the HCP."* Habitat Conservation Plan Assurances ("No Surprises") Rule, 63 Fed. Reg. 8859, 8863 (Feb. 23, 1998) (codified at 50 C.F.R. §§17.22, 17.32 (2006)).

72. 16 U.S.C. §1539(j)(2)(A), ELR Stat. ESA §10(j)(2)(A). Authorization for agency or organization relocating the population is obtained under §10(a)(1)(A) of the ESA, which provides for the FWS to grant permits "to enhance the propagation or survival of the affected species, including, but not limited to, acts necessary for the establishment and maintenance of experimental populations." *Id.* §1539(a)(1)(A). The "but not limited to" language of this permitting provision suggests other potential applications may arise in connection with enhancing the survival of climate-threatened species.

73. Although several other environmental statutes use the phrase or something close to it, all leave it undefined. *See* Michael J. Brennan et al., *Square Pegs and Round Holes: Application of the "Best Scientific Data Available" Standard in the Endangered Species Act*, 16 Tul. Envtl. L.J. 387, 402 n.81 (2003) (collecting statutes); Holly Doremus, *Listing Decisions Under the Endangered Species Act: Why Better Science Isn't Always Better Policy*, 75 Wash. U. L.Q. 1029, 1034 n.9 (1997) (collecting statutes).

74. *See, e.g.*, Loggerhead Turtle v. County Council, 120 F. Supp. 2d 1005, 1023, 30 ELR 20621 (M.D. Fla. 2000) ("Where there is a substantial volume of research, data, and comments, the agency exercises its expertise to make a reasonable decision based on all of the data and information").

75. For example, federal agencies required to prepare environmental impact statements under the National Environmental Policy Act in connection with projects they carry out, fund, or authorize must "[o]btain the comments of any Federal agency which has . . . special expertise with respect to any environmental impact involved." 40 C.F.R. §1503.1(a)(1) (2007).

As for the take prohibition, listing species as threatened early will allow the agency to remove greenhouse gas emissions from consideration under §9 while keeping the take prohibition active with respect to other contributing threats. If an animal species is in endangered status—meaning §9 necessarily applies in full force—difficulties in establishing the burden of proof would support the exercise of prosecutorial discretion not to attempt to regulate greenhouse gas emissions. Under the §7 consultation program, project-specific jeopardy analyses should promote other federal agencies to consider ways of reducing greenhouse gas emissions, but should not lead to jeopardy findings.

Regulating Non-Climate Effects to Protect Climate-Threatened Species. The agency's objective should be to support the bridge function of the ESA and reduce the adverse impacts on species from human adaptation to climate change. Where a species weakened by climate change is also threatened by other anthropogenic sources, such as loss of habitat, and where the agency reasonably believes addressing the non-climate threats will help carry the species through the climate change transition, the agency should use §7 and §9 regulatory powers to the extent necessary. In particular, where human adaptation to climate change exacerbates threats to a species, the agency should aggressively employ its regulatory presence through §7 consultations and enforcement of the §9 take prohibition. The agency also must monitor the impacts of human adaptation on species that face no direct or secondary ecological threat from climate change and employ §7 and §9 powers accordingly. Clearly, however, innovative approaches will be needed, such as market-based incentives and regional planning efforts, to facilitate human adaptation measures as much as species can tolerate.

Designing Conservation and Recovery Initiatives. The agency's objective should be to get as many species with a long-term chance at survival and recovery through the transition to the other side of climate change as is realistically possible. The agency must initially differentiate between species that are unlikely to survive climate change under any circumstances and those that are likely to benefit from assistance in their home ecosystems. Agency resources should not be wasted in developing recovery plans or other conservation measures for non-recoverable species. For species that appear likely to withstand climate change under the ESA's protection, recovery plans should identify the expected intensity of assistance required to manage or respond to primary and secondary ecological effects. Conservation measures for species that require intensive assistance, particularly in §10 HCPs, should be designed around adaptive management techniques that involve ample monitoring and considerable room for adjustment of management actions in order to account for the possibility that continuing climate change will alter the effectiveness of those actions.

Species Trade Offs. The agency's objective should be to not contribute to ecological reshuffling through its species management efforts. Where the measures described above are complicated by species trade offs—when helping one may harm another—the agency should adopt an ecosystem-based management approach modeled on promoting long-term species diversity and ecosystem multifunctionality.[76] When ecological models do not point to a particular management action to serve those goals, general default priorities, such as assisting top-level predators and resisting induced invasions, may help mediate between species in conflict.

Dealing With the Doomed. The agency's objective should be to avoid accelerating the decline of species who stand no chance of surviving climate change, but not to take measures on their behalf which could pose threats to other species. Under this standard, assisted migration should be employed for a such a species only if the FWS has assembled conclusive evidence of the extinction threat, a quantitative model showing the likely success of assisted migration for the species with de minimis anticipated effects on other species, and an assisted migration management plan including long-term monitoring and active adaptive management.[77] Human adaptation measures that could accelerate the extinction of the species, which could cascade to affect other species, should be regulated under §7 and §9 as for any other listed species.

V. Conclusion

The "pit-bull" has met its match, but sometimes old dogs can learn new tricks. It is sobering to find that ecological reshuffling is inevitable and to realize that the ESA can't do anything about it. Yet this is precisely what leads me to my proposal that the statute be employed in a more focused manner in the decades leading to our no-analog future. The statute provides the flexibility to proactively identify the threat of climate change and focus on helping those species that can be helped.

My proposal is unlikely to satisfy strong supporters of the ESA or its strong critics. The former are likely to believe the "pit bull" has found its ultimate calling in climate change. If there is any statute that can wrestle greenhouse gas emissions to the ground (i.e., to 1990 levels), they might think, it is the ESA and its unrelenting biocentric mission, whereas my proposal keeps the statute at bay. The latter will object to my proposal's aggressive call for species listings, which is based on wholesale adoption of the premise of human-induced climate change, and to its continued use of the statute as a regulatory weapon against habitat loss and other non-climate threats to climate-threatened species.

Both views doom the ESA. Of course, that may be the intent and hope of the statute's critics, with or without climate change. But adopting the strong version of the ESA in the climate change era, in which the FWS charges hard after greenhouse gas emissions, would play right into the critics'

76. Maximizing biodiversity will assist the ecosystems of the future, whatever pattern they assume, in establishing and maintaining resilience. *See* Andy Hector & Robert Bagchi, *Biodiversity and Ecosystem Multifunctionality*, 448 Nature 188, 188 (2007).

77. This approach is what Jason McLachlan et al. refer to as "constrained assisted migration," as opposed to aggressive use of assisted migration at one extreme and total prohibition of the practice at the other extreme. Jason S. McLachlan et al., *A Framework for Debate of Assisted Migration in an Era of Climate Change*, 21 Conservation Biology 297, 299 (2007).

hands—the statute is neither designed to regulate something so ubiquitous as greenhouse gas emissions nor so sacrosanct as to survive the political battle attempting to do so would ignite. Support for the ESA, therefore, must be tempered by practical and political reality if the ESA itself is to survive climate change. The trade off I propose—standing back from greenhouse gas emissions but staying fully engaged in regulating non-climate threats, particularly those stemming from human adaptation to climate change—is the plan the ESA needs in order to build the bridge for species into the no-analog future.

VI. Epilogue

In May 2008, after the original version of this article was published in the *Boston University Law Review*, the FWS promulgated a final rule listing the polar bear as threatened based on factors that included the impacts of climate change on Arctic sea ice.[78] Secretary of the Interior Dirk Kempthorne stressed at the time that the listing would not provide a basis for using the ESA to regulate greenhouse gas (GHG) emission sources.[79] The FWS also issued interim and final §4(d) rules for the polar bear, exempting from §9 take prohibitions any activity already exempt or authorized under the Marine Mammal Protection Act and, for any activity outside of Alaska, also exempting all takes incidental to a lawful purpose.[80] The unspoken purpose of the latter approach undoubtedly was to cut off claims that GHG emissions sources outside of Alaska are causing unauthorized take of the polar bear. In tandem with that, the Department of the Interior also issued a memorandum explaining it will not consider GHG emissions in consultations about the polar bear or other species listed due to climate threats.[81]

The FWS and NMFS later followed up on that position by promulgating new §7(a)(2) consultation regulations designed to, among other things, preclude consideration of greenhouse emissions in consultations. Culminating one of the most controversial rulemakings in the history of ESA implementation, in December 2008, the FWS and NMFS promulgated final rules revising various features of the §7 consultation regulations. The changes, too extensive to cover and assess in detail here, fall into three categories: (1) revised and new definitions for the causation and effects analyses; (2) revisions to applicability designed to preclude consideration of GHG emissions in consultations; and (3) streamlined consultations through a shift in decision authority to action agencies. Some of the changes merely codify existing conditions, such as a new provision limiting consultations to discretionary actions. But some have the potential to radically alter consultation practice. Some significant changes include:

- Indirect effects are limited to those effects that occur later in time for which the proposed action is an "essential cause."[82]
- If an effect will occur whether or not the proposed action takes place, it is not an indirect effect.[83]
- Indirect effects must be reasonably likely to occur based on "clear and substantial information."[84]
- For actions not anticipated to cause take, no consultation is necessary if the effects are manifested through "global processes" that cannot be reliably predicted or measured, have an insignificant impact, or pose only a remote risk.[85]
- For actions not anticipated to cause take, no consultation is necessary if the effects are not capable of being measured in a way that permits "meaningful evaluation."[86]
- Action agencies will determine for themselves whether, under these new standards, formal consultation is necessary.

The rule attracted considerable controversy: tens of thousands of comments were filed on the proposal, and litigation was filed immediately to challenge the final regulations. Many environmental strategists outlined ways the Obama Administration could, through executive action or in concert with Congress, swiftly nullify the rule. In March 2009 President Obama ordered FWS and NMFS to review the rules and authorized other federal agencies "to follow the prior longstanding consultation and concurrence practices."[87] Soon thereafter Congress passed legislation allowing the agencies to withdraw the polar bear §4(d) rule and the consultation rule with no notice and comment procedures,[88] which the agencies did for the consultation rule effective May 4, 2009.[89]

Other than raise a fuss about the Bush Administration consultation rule, however, neither Congress nor the Obama Administration has shown any interest in dragging the ESA into the war on greenhouse gas emissions. Nothing in the legislation allowing the agencies to overturn the rules or in the agencies' statement accompanying the decision to overturn the consultation rule so much as mentions climate change or greenhouse gas emissions. Indeed, the only indications suggest environmental groups will not like the

78. *See* 73 Fed. Reg. 28212 (May 15, 2008).
79. U.S. Dept. of the Interior, News Release, Secretary Kempthorne Announces Decision to Protect Polar Bears Under Endangered Species Act (May 14, 2008).
80. *See* 73 Fed. Reg. 28306 (May 15, 2008) (interim rule); 73 Fed. Reg. 76249 (Dec. 16, 2008) (final rule).
81. *See* Solicitor, U.S. Dept. of the Interior, Guidance on the Applicability of the Endangered Species Act's Consultation Requirements to Proposed Actions Involving the Emission of Greenhouse Gases (Oct. 3, 2008); U.S. Geological Survey, The Challenges of Linking Carbon Emissions, Atmospheric Greenhouse Gas Emissions, Global Warming, and Consequential Impacts (May 14, 2008).
82. 50 C.F.R. §402.02 (2002).
83. *Id.*
84. *Id.*
85. *Id.* §402.03(b)(2).
86. *Id.* §402.03(b)(3)(i).
87. *See* Office of the Press Secretary, The White House, Memorandum for the Heads of Executive Departments and Agencies Re: The Endangered Species Act (Mar. 3, 2009).
88. 2009 Omnibus Appropriations Act, Pub. L. No. 111-8, Division E, Title IV, §429 (2009).
89. *See* Interagency Cooperation Under the Endangered Species Act, 74 Fed. Reg. 20421 (May 4, 2009)

Obama Administration's position much more than the Bush Administration's: David Hayes, recently confirmed Deputy Secretary of the Department of the Interior, told senators during his confirmation hearing that the endangered species law is ill-suited for addressing greenhouse gas emissions; Tom Strickland, the new Assistant Secretary for Fish, Wildlife and Parks overseeing the ESA, said the same at his hearing; and, more directly to the point, FWS spokesman Josh Winchell said in February 2009 that "we have zero legislative authority to regulate carbon emissions. That's just not what we do. With the polar bear, the science definitely pointed to climate change, but that doesn't all of a sudden give us the authority to address the underlying cause, which is carbon emissions."[90] Putting those words into action, on May 8, 2009, Interior Secretary Salazar announced the agency's decision *not* to rescind the polar bear §4(d) rule, proclaiming that "the Endangered Species Act is not the proper mechanism for controlling our nation's carbon emissions."[91]

On the other hand, the FWS and NMFS may be reversing course from the Bush Administration on identifying climate change as a basis for listing other species. Indeed, in the most fitting update for this article, on February 12, 2009, the Center for Biological Diversity (represented by Earthjustice) and the FWS settled litigation over the pika so as to require the agency to assess whether the pika may warrant protection under the ESA by May 2009 and, if so, determine whether the pika will be designated as an endangered species nine months later.[92] On May 7, 2009, the agency provided notice that it had determined listing of the pika may be warranted and that it will initiate a status review to determine whether the species should be listed.[93] Perhaps the pika is not toast after all.

90. Greenwire, *Endangered Species: Some See EPA's Climate Proposal Prodding Interior on ESA* (Apr. 23, 2009), *available at* http://www.eenews.net/public/Greenwire/print/2009/04/23/4; *see also* Alan Kovski, *Deputy Secretary, Nominee Hayes Agrees Endangered Species Act Poor Vehicle for Controlling GHG Emissions at Confirmation Hearing*, 40 Env't Rep. (BNA) 622 (2009).

91. News Release, U.S. Fish & Wildlife Service, Salazar Retains Conservation Rule for Polar Bears, Underlines Need for Comprehensive Energy and Climate Legislation (May 8, 2009), *available at* http://www.fws.gov/news/NewsReleases/showNews.cfm?newsId=20FB90B6-A188-DB01-04788E0892D91701.

92. *See* Center for Biological Diversity, Press Release, Federal Agency Agrees to Consider Endangered Species Protection for American Pika: Global Warming Driving Alpine Rock Rabbit Toward Extinction (Feb. 12, 2009), *available at* http://www.biologicaldiversity.org/news/press_releases/2009/pika-02-12-2009.html (last visited May 18, 2009).

93. *See* Endangered and Threatened Wildlife and Plants; 90-Day Finding on a Petition to List the American Pika as Threatened or Endangered With Critical Habitat, 74 Fed. Reg. 21301 (May 7, 2009).