

## ARTICLE

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

by J.B. Ruhl

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## I. Introduction

The pika is toast. More specifically, the American pika (*Ochotona princeps*) is running out of places to live,<sup>1</sup> and global climate change appears to be the primary cause of its decline.<sup>2</sup> This tiny rabbit-like species has the unfortunate

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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 princeps*) 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 2007: IMPACTS, ADAPTATION, AND VULNERABILITY]; 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

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),<sup>3</sup> often referred to as the "pit bull" of environmental laws.<sup>4</sup> The United States Fish & Wildlife Service (FWS), which administers the ESA for terrestrial and freshwater species,<sup>5</sup> 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.<sup>6</sup> The ESA is credited

- 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](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.<sup>7</sup>

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,<sup>8</sup> 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.<sup>9</sup> 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.<sup>10</sup>

But the Supreme Court nipped this kind of reasoning in the bud. In *Massachusetts v. EPA*,<sup>11</sup> 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.<sup>12</sup> 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.<sup>13</sup>

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<sup>14</sup> and the question this article explores from the perspective of the ESA as presently constituted.<sup>15</sup> Many ecologists believe we face a no-analog future—one for which we have no experience on which to base projections of ecosystem change<sup>16</sup> and for which models designed to allow active management decisions as climate change takes effect are presently rudimentary and imprecise.<sup>17</sup>

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<sup>18</sup>; (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.”<sup>19</sup>

- Section 4 authorizes FWS to identify “endangered” and “threatened” species, known as the listing function,<sup>20</sup> and then to designate “critical habitat”<sup>21</sup> and develop “recovery plans”<sup>22</sup> 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.<sup>23</sup>
- 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.<sup>24</sup>
- Sections 7 (for federal agency actions)<sup>25</sup> and 10 (for actions not subject to §7)<sup>26</sup> establish a procedure and criteria for FWS to approve “incidental take” of listed species.<sup>27</sup>

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).

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.<sup>28</sup>

### 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.<sup>29</sup> 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.<sup>30</sup>

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.<sup>31</sup> Cli-

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.<sup>32</sup>

## 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.<sup>33</sup>

### I. 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.<sup>34</sup> 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,<sup>35</sup> life-stage habitat loss,<sup>36</sup> and altered biological events.<sup>37</sup>

### 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

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).

increased stress,<sup>38</sup> successful adaptive migration,<sup>39</sup> and opportunistic invasion.<sup>40</sup>

## 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,<sup>41</sup> degraded ecological conditions,<sup>42</sup> and induced invasions<sup>43</sup> 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.”<sup>44</sup> 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”<sup>45</sup> and that designation of critical habitat must take “into consideration the economic impact, the impact on national security, and any other relevant impact”<sup>46</sup> and the agency is confronted with yet another layer of policy balanc-

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."<sup>47</sup> 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.<sup>48</sup>

*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.

#### I. Identifying Species

Section 4(a)(1)<sup>49</sup> 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-

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.

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

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).<sup>50</sup> 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.<sup>51</sup> 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.”<sup>52</sup> 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.<sup>53</sup> Indeed,

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

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.”<sup>54</sup> 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.”<sup>55</sup> 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.”<sup>56</sup> 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.<sup>57</sup> 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,<sup>58</sup> “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.”<sup>59</sup> 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,

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.<sup>60</sup> 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.<sup>61</sup> 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.”<sup>62</sup> 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*,<sup>63</sup> the court evidenced little tolerance<sup>64</sup> for the FWS’ failure to consider climate change in a consultation report.<sup>65</sup> 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

#### I. 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.<sup>66</sup> To seek approval, an applicant must submit a habitat conservation plan (HCP), describing the project and its impact on the species.<sup>67</sup> 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.”<sup>68</sup> 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.<sup>69</sup> 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.<sup>70</sup>

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.<sup>71</sup> 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.”<sup>72</sup> 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,<sup>73</sup> the standard acknowledges that the FWS is the expert science agency when it comes to defining threats to species and

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).

the measures needed for conservation of species.<sup>74</sup> 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.<sup>75</sup>

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.

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.<sup>76</sup> 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.<sup>77</sup> 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.<sup>78</sup> 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.<sup>79</sup> 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.<sup>80</sup> 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.<sup>81</sup>

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.”<sup>82</sup>
- If an effect will occur whether or not the proposed action takes place, it is not an indirect effect.<sup>83</sup>
- Indirect effects must be reasonably likely to occur based on “clear and substantial information.”<sup>84</sup>
- 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.<sup>85</sup>
- 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.”<sup>86</sup>
- 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.”<sup>87</sup> 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,<sup>88</sup> which the agencies did for the consultation rule effective May 4, 2009.<sup>89</sup>

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."<sup>90</sup> 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."<sup>91</sup>

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.<sup>92</sup> 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.<sup>93</sup> Perhaps the pika is not toast after all.

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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>.

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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](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).



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

by Donald C. Baur

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Over the 35 years of its existence, the Endangered Species Act (ESA)<sup>1</sup> has given rise to a unique lexicon of buzzwords, catch-phrases, and terms-of-art. The depth and creativity of this vocabulary is not surprising, given the complex nature of the ESA's requirements and the pervasive effect they have had on wildlife conservation and the management and use of natural resources throughout the world.

The ESA, we have heard time and time again, is "the pit bull of environmental laws." Depending on the commentator's perspective, the "pit bull" needs to be either "defanged" and sent to "obedience school" or "unleashed" and trained to go for the "jugular vein" of resource development activities. The ESA is regarded by some as a "safety net" for species in the "intensive care unit" and by others as a place where species go to "check in but never check out." Nonfederal landowners entering into contractual habitat conservation plans are entitled to "no surprises" commitments from the federal government, just as landowners seeking to do good things for listed species without fear of regulatory penalties can obtain "safe harbor." Secretary Babbitt had his "five-point plan" for landowner incentives, while Secretary Norton sought to advance "the four C's", and Secretary Kempthorne lauded the "cooperative conservation" approach to ESA implementation.

In his article *Climate Change and the Endangered Species Act: Building Bridges to the No-Analog Future*, Prof. J.B. Ruhl has added another entry to the ESA edition of *Words and Phrases*. Ruhl begins his excellent and timely article about the effects of global warming on listed species and how the

ESA does, and does not, address the problem by informing the reader: "The pika is toast."<sup>2</sup>

The pika, Ruhl explains, is a "tiny rabbit-like species [that] 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."<sup>3</sup> The pika is confronting a threat to its survival because global warming is reducing its available habitat. The species has, as a result, become symbolic of the fate of many other species potentially affected by global warming caused by greenhouse gas emissions (GHG). If the pika is "toast" because of climate change, so are many other species.<sup>4</sup>

As Ruhl describes the dilemma, many species already are experiencing, or will soon encounter, three levels of adverse effects related to climate change. The most significant threat is from primary ecological effects:

[T]he ecological conditions it [the pika and other species dependent on colder climate habitat] 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 [or alters the habitat of other species] which they now call home. 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

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

2. J.B. Ruhl, *Climate Change and the Endangered Species Act: Building Bridges to the No Analog Future*, 39 ELR (ENVTL. L. & POL'Y ANN. REV.) 10735 (Aug. 2009) (a longer version of this Article was originally published at 88 B.U. L. REV. 1 (2008)).

3. *Id.*

4. The other species most frequently mentioned as being potentially at risk from climate change are: arctic fox, Ashy storm petrel, bearded seal, bowhead whale, Cook Inlet beluga whale, Caribbean coral, Kittlitz's murrelet, Pacific walrus, penguins, polar bear, ribbon seal, ringed seal, spectacled eider, spotted seal, Steller's eider, and yellow-billed loon. The Center for Biological Diversity, a strong proponent of ESA listing of climate change-affected species, states: "Very few species will escape the burn of climate change. A landmark study surveying 20 percent of the Earth's land area offered a stark prediction: 35 percent of the species will be committed to extinction by the year 2050 if greenhouse gas emission trends continue." Center for Biological Diversity, Climate Law Institute, at [http://www.biologicaldiversity.org/programs/climate-law\\_institute/index.html](http://www.biologicaldiversity.org/programs/climate-law_institute/index.html) (last visited Feb. 2, 2009).

category will come from stranding, life-stage habitat loss, and altered biological events.<sup>5</sup>

Added to these first order threats are the secondary ecological effects of increased stress, successful adaptive migration, and opportunistic invasion, all of which add to the cumulative effect of “ecological disruption and species reshuffling.”<sup>6</sup> Finally, the survival of these species will be further complicated by a third category of effects: human adaptation to an increasingly warmer planet, such as direct habitat conversion, degraded ecological conditions, and induced invasion.<sup>7</sup>

These problems create a clear need to bring climate-threatened species under “the protective wings” of the ESA,<sup>8</sup> but the challenge is that the ESA has taken a species-specific approach that is effective only when dealing with straightforward causal connections between human-caused threats and species threats. What can the ESA do for the pika and similarly situated species, Ruhl asks, when the threat to survival comes from “all anthropogenic sources of greenhouse gases throughout the planet, from a small farm to a sprawling refinery” in ways that are “gradual and largely invisible to human perception.”<sup>9</sup>

Recognizing this problem inherent in the ESA, Ruhl provides a much-needed dissection of what the ESA can, and cannot, be expected to do. He effectively breaks the Act down into its key components, and looks at each through the lens of climate change effects on wildlife. For this purpose, Ruhl uses six key “policy choice pressure points” and relates ESA requirements to each one. In taking on this task, he correctly acknowledges that his proposal “is unlikely to satisfy strong supporters of the ESA” (because he disclaims any realistic ability of the Act to control GHG) “or its strong critics” (who will oppose Ruhl’s recommendation for extensive listings and use of the law to regulate habitat loss). As is often the case, by potentially alienating both ends of the ESA advocacy spectrum, Ruhl has come up with a commonsense, pragmatic prescription for deploying the action-forcing provisions of the ESA to their most effective use in assisting listed species in surviving the effects of climate change.

The first policy choice is for *identifying and listing climate-threatened species*. Ruhl calls for aggressive and early identification of species threatened by climate change, which brings the ESA’s listing and critical habitat designation requirements of §4 into play.<sup>10</sup>

It is hard to argue with this objective. Indeed, the listing process is already immersed in numerous petitions and law-

suits for the failure of the Services to list species affected by climate change, the most prominent of which was the May 14, 2008, decision to list the polar bear as a threatened species.<sup>11</sup> Pursuing Ruhl’s prescription of an aggressive listing program should not equate, however, with lowered standards or more permissive standards, merely because there may be a climate change-connection with a species’ status. The Services need to develop standardized guidelines and principles for reviewing listing prospects when climate change is a factor, instead of the largely ad hoc approach currently utilized. With such guiding principles in place, the Services should give priority to these species and make the appropriate decisions.<sup>12</sup>

The second policy choice involves *whether the ESA should be used to regulate GHG*. Ruhl is again correct in concluding that the agencies “should not attempt to use [their] §7 and §9 regulatory programs in an effort to regulate greenhouse gas emissions.” Section 7 sets forth the prohibition on jeopardizing the future existence of listed species or adversely modifying critical habitat as determined through consultation between the appropriate Service and the federal action agency,<sup>13</sup> while section 9 prohibits the taking (i.e., killing, injuring, harassing or harming—causing death or injury by habitat modification) of endangered species.<sup>14</sup> Other legal experts on the ESA agree with Ruhl in this regard. As John Kostyack and Dan Rohlf have observed, such a use of the ESA is difficult to square with any legal doctrine and is beyond the current scientific capability of the Services.<sup>15</sup> A full-blown section 7 review of anything but a tiny subset of the federal actions implicated in such emissions would divert agency resources or require a vast expansion of budgets. Regulating GHG, Ruhl, Kostyack, and Rohlf agree, should be the task of other laws, including hoped-for new legislation.

On the subject of section 7 applicability, a word needs to be said about controversial recent amendments to the ESA regulations published in the waning days of the Bush

5. Ruhl, *supra* note 2, at 10738.

6. *Id.*

7. *Id.*

8. *Id.* at 10736.

9. *Id.* at 10736.

10. 16 U.S.C. §1533. ESA implementation is vested in two agencies. Terrestrial species are under the jurisdiction of the U.S. Fish and Wildlife Service (FWS) in the Department of the Interior while marine species are under the authority of the National Marine Fisheries Service (NMFS) in the Department of Commerce.

11. Determination of Threatened Status for the Polar Bear (*Ursus maritimus*) Throughout Its Range: Final Rule, 73 Fed. Reg. 28211, 28212 (May 15, 2008) (to be codified at 50 C.F.R. pt. 17). The listing decision was accompanied by an interim final rule published under §4(d) of the ESA to declare that the listing would not lead to any regulation of GHG and that the provisions of the Marine Mammal Protection Act were, according to FWS, more stringent than the ESA and would supersede the latter. Determination of Threatened Status for the Polar Bear, 73 Fed. Reg. at 28306.

12. On January 16, 2009, Interior Solicitor David Bernhardt issued a formal legal opinion that sets guiding legal principles for determining when a species may be threatened with extinction in “the foreseeable future,” which is a requirement for listing in §4(a)(1) of the Act. Memorandum from Interior Solicitor to Acting Director, FWS, Opinion M-37021 (Jan. 16, 2009).

13. 16 U.S.C. §1536(a)(2), ELR STAT. ESA §7.

14. *Id.* at §1538(a)(1) (extended by regulation to most threatened species).

15. John Kostyack & Dan Rohlf, *Conserving Endangered Species in an Era of Global Warming—A Conservative Perspective*, in DONALD C. BAUR & WILLIAM R. IRVIN, *ENDANGERED SPECIES ACT: LAW, POLICY, AND PERSPECTIVES* (2002) (2d ed. forthcoming). See also John Kostyack & Dan Rohlf, *Conserving Endangered Species in an Era of Global Warming*, 38 ELR 10203 (Apr. 2008), a set of detailed recommendations for implementation by the ESA to address climate change effects.

Administration.<sup>16</sup> One feature of these regulations is to exempt impacts related to global processes, such as climate change, from section 7 consultation and the jeopardy/adverse modification prohibition. Along the same lines, the regulations exempt impacts that are “not capable of being measured or detected in a manner that permits meaningful evaluation.”<sup>17</sup> Both of these changes are aimed at precluding the review of GHG and the effects of climate change on listed species from section 7 consultation. It is the case that virtually all such sources of GHG and related effects will not raise to a level that *triggers section 7 consultation*.<sup>18</sup> Nonetheless, the legal validity and efficacy of precluding all consultation through an across-the-board rule change is questionable. Not surprisingly, environmental groups, as well as the state of California, challenged the rule as soon as it was published. A more appropriate approach to applying section 7 to GHG would be to extend the best available science under the pre-existing ESA rules to pending federal actions for purposes of determining whether a “may affect” situation exists. This use of the best available science would lead, before long, to established scientific precedent supporting fact-based determinations that GHG are not the basis for § 7(a)(2) application.

The third ESA policy area Ruhl identifies is *regulation of non-climate effects to protect climate-threatened species*. In this case, Ruhl urges aggressive use of section 7 and section 9 when doing so “will help carry the species through the climate change transition.”<sup>19</sup> Under Ruhl’s strategy, this is the area where the regulatory consequences of climate change under the ESA are most likely to be felt by development activities. The reach of the ESA in this regard is currently being felt in the California Bay-Delta where reduced water supply arguably caused by climate change is, for example, creating an even greater threat for the already endangered Delta smelt, leading to severe section 7 limitations on California’s water supply systems.<sup>20</sup>

Ruhl correctly observes that this policy area calls for “innovative approaches . . . such as market-based incentives and regional planning efforts. . . .”<sup>21</sup> Finding creative ways to apply the ESA is especially important in this policy area because there often will be no relationship between the cause of underlying climate-related threats (e.g., these activities are not the source of GHG or the carbon fuel resources that generate them) and the development activity that will bear the regulatory burden. In the Delta smelt situation, for example, reduced flows attributed to climate change are not caused by water supply entities, yet they are the parties being affected by tough ESA restrictions on their water transfer activities in

effort to keep more water available for the fish. This absence of a direct cause and effect relationship makes enforcement more difficult, as a legal matter, and more subject to abuse. With no other ESA regulatory targets available, there may be a temptation to place too much of the burden on the parties whose activities impact the climate-change threatened species. Ruhl anticipates this problem by recognizing that, again, “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.”<sup>22</sup> As the Delta smelt situation demonstrates, thus far it has been litigation, not creative and cooperative management response, that is driving the ESA response to climate change in this policy area.

The fourth policy area listed by Ruhl, *designing conservation and recovery initiatives*, falls within one of the most underused aspects of the ESA. Ruhl suggests that little time should be devoted to species that are unlikely to survive climate change; instead, such efforts ought to be focused on species that have a chance for survival. While this proposition has surface appeal, and may at some point in the future be a realistic avenue to pursue, right now and for the foreseeable future it is highly speculative to differentiate among climate change-threatened species in this manner. All species currently considered climate change-affected deserve meaningful recovery plans and conservation programs, and they should be developed on a priority basis.

Ruhl’s final two policy areas—*species trade offs* and *dealing with the doomed*—also anticipate continuing climate deterioration that will give rise to calamitous situations where some species will not survive and in which federal officials will have to make choices over which species to conserve when promoting the well-being of one cannot be achieved without harming the other. Ruhl argues for a utilitarian approach in these cases, trying to avoid the conflicts wherever possible, but when it is not, applying “default priorities, such as assisting top-level predators.”

Ruhl is correct to offer ideas on how to deal with these situations. The likelihood of them arising with frequency is, however, uncertain. Should these situations arise, they will present some of the hardest choices ever made under the ESA. Such a judgment call entails a deliberate decision by the federal government to allow a particular species to blink out. Such a decision is unlikely to be addressed by applying the preconceived or standardized default judgments. As a legal matter, coming to a conclusion about whether and how to allow a species to become extinct will almost certainly be the grist for intensive public debate, legal dispute, and possible application of the exemption process under the Endangered Species Committee.<sup>23</sup>

The prescriptions for adapting ESA implementation to the climate change era offered by Ruhl make considerable sense, but are they practical and achievable? Is it possible to drag

16. Interagency Cooperation Under the Endangered Species Act, 73 Fed. Reg. 76272 (Dec. 1, 2008) (to be codified at 50 C.F.R. pt. 402.03(b)(3)).

17. *Id.*

18. Section 7 consultation is triggered by a “may affect” finding. 50 C.F.R. §402.14. Individual sources of GHG will be such small, incremental, and untraceable contributors to global warming as in impacting a particular species that it will be almost impossible for those effects of the federal action leading to those emissions to meet this threshold finding.

19. Ruhl, *supra* note 2, at 10743.

20. National Resources Defense Council v. Kempthorne, No. 1:05-CV-01207, 2008 WL 5054115 (E.D. Cal. 2009).

21. Ruhl, *supra* note 2, at 10743.

22. Ruhl, *supra* note 2, at 10743.

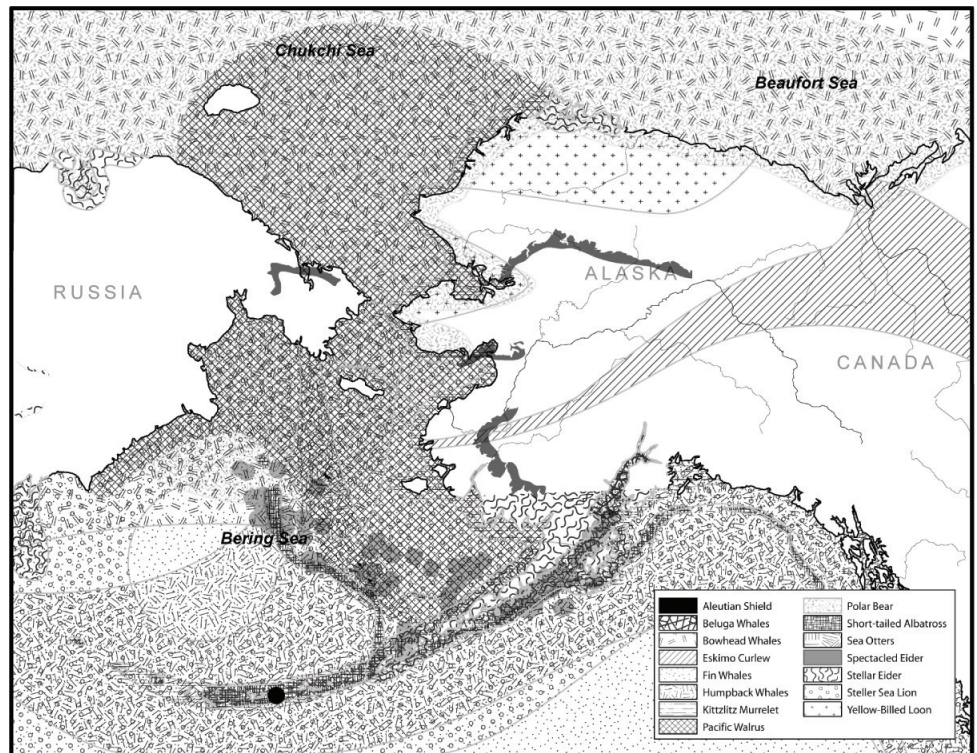
23. Section 7(e) establishes the Endangered Species Committee, often called the “God Squad,” to make determinations of when federal actions causing jeopardy should proceed despite their consequences for the listed species. 16 U.S.C. §1536(e), ELR STAT. ESA §7(e).



the massive federal bureaucracies charged with administering the ESA across Ruhl's "bridge to the no analog future"? Even if the agencies are willing and able to make this journey, will they do so when confronted by the shortage of funds and the unrelenting challenge of an extensive litigation docket, much of which is driven by time-consuming, staff-intensive violations of listing and critical habitat designation duties?

In *No Analog Future*, Ruhl lays out very helpful general guidelines for making climate change-related decisions under the ESA. The next step is to identify the specific administrative steps necessary to carry them out. The initial challenge is to reorient the thinking within the Services away from single-species approaches. Even in areas where a host of climate change ESA issues are already occurring, such as Alaska, the two Services continue to address listing, critical habitat designation, recovery planning, and action agency decisionmaking on a species-by-species basis. This pattern continues despite the overlapping habitat ranges and common global warming-caused threats that link many of the affected species together. As a map showing the ranges of species in Alaska that are listed, proposed for listing, candidates for listing, or subject to listing petitions demonstrates,<sup>24</sup> the entire offshore and coastal zone of Alaska is habitat for these species.

Because climate change effects on listed species will often be similar in nature and apply to identifiable geographical areas—the arctic, cold and high-altitude mountain ranges, watersheds in arid states, low-lying coastal areas subject to sea-level rise, etc.—the priority effort by the Services should be to apply ecosystem-based approaches to Ruhl's policy areas for: (1) listing; (2) recovery; and (3) regulation of non-climate effects, especially by means of the application of innovative measures. Precedent already exists for ecosystem-based listing from October 21, 2008, when the Bush Administration proposed to list simultaneously 48 species (mostly plants) in a specific location in Hawaii based on common habitat threats. The proposal also would designate 27,600 acres of critical habitat.<sup>25</sup> Ecosystem approaches also have been used to regulate activities in specific areas under combined legal authorities such as the ESA and Marine Mammal Protection Act: speedboat zones for manatee protection



in Florida,<sup>26</sup> and cruise ship restrictions in Alaska to protect humpback whales.<sup>27</sup> Clearly, the legal authority to undertake such approaches exists. The challenges for the Services, in the era of climate change and under new political leadership, are to take the initiative to use these legal authorities proactively and, in doing so, construct and cross the bridge Ruhl envisions.

24. Map prepared by R. Brezenoff & T. Robertson, Perkins Coie LLP, for presentations at *Permitting Strategies in Alaska*, sponsored by The Seminar Group (Jan. 17, 2008) and *Alaska Resources 2009*, sponsored by the Resource Development Council (Nov. 20, 2008).

25. Listing 48 Species on Kauai as Endangered and Designating Critical Habitat, 73 Fed. Reg. 62592 (Oct. 21, 2008) (to be codified at 50 C.F.R. pt. 17).

26. 50 C.F.R. §17.100–.108 (2008).

27. 36 C.F.R. §§13.1150–.1160 (2008).

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

by Wm. Robert Irvin

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With one of the more memorable opening lines in the annals of legal scholarship,<sup>1</sup> J.B. Ruhl has skillfully set forth the promise and perils of addressing global warming's impact on imperiled species under the Endangered Species Act (ESA).<sup>2</sup> But while the pika may indeed be toast, other species affected by climate change have a better chance of survival and, as Ruhl notes, the ESA can play a critical role in ensuring it.

A recent study has found that the effects of climate change already underway will be with us for a millennium or longer.<sup>3</sup> With this grim forecast, the need to reduce greenhouse gas emissions, known as mitigation, is even more acute, in order to stave off even worse irreversible impacts of climate change. At the same time, the need to focus additional attention on adaptation—taking measures to assist wildlife survival in the face of climate change—is also greater, since the effects of climate change will be with us much longer than previously thought.

The ESA can be usefully employed to address both mitigation and adaptation. Starting with the determination whether to list a species as threatened or endangered, the ESA can generate and focus attention on the impacts of climate change on wildlife. While the pika may not garner much public attention, the prospect of polar bears becoming extinct due to melting of their sea ice habitat has brought widespread attention to the impacts of climate change and the need to reduce greenhouse gas pollution. As the list of species threatened by climate change inevitably grows, the imperative to address the causes of climate change, as well as to implement measures to help threatened wildlife survive, will grow concomitantly.

1. J.B. Ruhl, *Climate Change and the Endangered Species Act: Building Bridges to the No-Analog Future*, 39 ELR (ENVTL. L. & POL'Y ANN. REV.) 10735 (Aug. 2009) (a longer version of this Article was originally published at 88 B.U. L. REV. 1 (2008)).
2. 16 U.S.C. §§1531-1544, ELR STAT. ESA §§2-18.
3. Susan Solomon et al., *Irreversible Climate Change Due to Carbon Dioxide Emissions*, 106 PROC. NAT'L ACAD. SCI. 1704, 1704-05 (Feb. 10, 2009), available at <http://www.pnas.org/content/106/6/1704.full.pdf+html> (last visited May 18, 2009).

In addition to focusing attention on the problem of climate change, the ESA can also address climate change impacts on species and habitats. Ruhl argues, correctly, that the ESA can be usefully employed to address other threats to species imperiled by climate change. This principle, building resilience by reducing other stressors, is one of the key steps in helping wildlife survive climate change,<sup>4</sup> or, as Ruhl puts it, to help wildlife successfully cross the bridge to the no-analog future, a world in which ecosystems have been reshuffled as a result of climate change. For example, using the ESA's prohibition of take under §9<sup>5</sup> or interagency consultation provisions under §7<sup>6</sup> to limit habitat destruction from causes other than climate change, particularly in areas that may be necessary for species migration in response to climate change, might be a key strategy for assisting wildlife adaptation to climate change.

Although Ruhl counsels against doing so, the ESA can also be used to address the impacts of new sources of greenhouse gas pollution. While there may be political or prudential concerns with using the ESA this way, there is no statutory bar to such considerations. Indeed, the absence of any such statutory limits led the Bush Administration, on its way out of office, to promulgate regulations pursuant to §4(d) of the ESA<sup>7</sup> excluding emitters of greenhouse gas pollution outside the current range of polar bears from being considered as causing prohibited take of polar bears.<sup>8</sup> Similarly, the Bush Administration promulgated regulations largely

4. Lara J. Hansen & Jennifer L. Biringer, *Building Resistance and Resilience to Climate Change*, in *BUYING TIME: A USER'S MANUAL FOR BUILDING RESISTANCE AND RESILIENCE TO CLIMATE CHANGE IN NATURAL SYSTEMS* 9-13 (Lara J. Hansen et al., eds., WWF 2003) available at [http://assets.panda.org/downloads/buyingtime\\_unfe.pdf](http://assets.panda.org/downloads/buyingtime_unfe.pdf) (last visited May 18, 2009).
5. 16 U.S.C. §1538(a)(1), ELR STAT. ESA §9(a)(1).
6. *Id.* §1536(a)(2).
7. *Id.* §1533(d).
8. Endangered and Threatened Wildlife and Plants; Special Rule for the Polar Bear, 73 Fed. Reg. 76249 (Dec. 16, 2008). President Obama's Interior Secretary, Ken Salazar, subsequently announced he was retaining this rule. See News Release, U.S. Department of the Interior, Salazar Retains Conservation Rule for Polar Bears (May 8, 2009) available at [http://www.doi.gov/news/09\\_News\\_Releases/050809b.html](http://www.doi.gov/news/09_News_Releases/050809b.html).

barring consideration of greenhouse gas pollution through §7 consultation.<sup>9</sup>

Ruhl's admonition that the ESA may not be able to bear the political weight of being used to regulate greenhouse gas pollution should not be ignored. As so often happens, the ESA is in the position of being the final safety net, the law to be employed when all others have failed. If, for example, we had taken action sooner under the Clean Air Act<sup>10</sup> to regulate greenhouse gas pollution, we may have mitigated the severity of climate change and reduced the likelihood that species would be listed and the ESA brought into play. Regrettably, that did not happen and once again the ESA is poised to be the scapegoat for other failures of political will.

While there is political risk to the ESA itself in using it to address greenhouse gas pollution, that alone should not preclude its use for that purpose. Though often characterized as a giant red light that halts development, the ESA is better described as a yellow caution light, compelling us to think about the consequences of our actions for imperiled species before proceeding. As such, the ESA can often lead to creative solutions that allow a project to go forward while also protecting species and habitat. To arbitrarily decide that the ESA should not be used to consider the impacts of greenhouse gas pollution on polar bears or other species imperiled by climate change is to ignore the law's potential to stimulate creative solutions to seemingly intractable problems. Moreover, just because today we may lack the scientific precision to identify a particular source of greenhouse gas pollution as jeopardizing the continued existence of a particular species, that may not be the case in the future. Accordingly, the ESA should be employed, albeit prudently, to address the causes and impacts of climate change. For example, barring its use for these purposes, as the Bush Administration regulations attempted to do, is to deprive ourselves of a valuable tool in the all-out effort needed to deal with climate change.

Striking one other note of caution, Ruhl suggests that scarce agency resources should not be wasted on developing recovery plans for species, like the pika, that are doomed by climate change. Similarly, he argues that extraordinary measures, such as assisted migration, for such species should be sparingly used, if at all. Clearly, if the ESA is an emergency room for imperiled species, a system of triage is necessary. Not every species can be saved. But the determination of which species are in fact doomed may change over time, as our knowledge of their needs and our efforts to address the threats to the species expand. Thus, in addition to Ruhl's admonition that we should not do anything to accelerate the decline of species, we should not be too quick to write off species as hopeless cases.

Ruhl is correct to argue that the ESA be used to identify the threat of climate change to species and habitats and to concentrate its resources on those species that can best be helped, in order to assist as many species as possible to pass through the long bottleneck of imperilment from climate change. His call for judicious use of the ESA should not, however, be misconstrued as an excuse for inaction. To the contrary, Ruhl has recognized the important role the ESA can and should play in addressing the greatest threat yet to biological diversity. Using the ESA to combat climate change certainly poses some risk to the continued viability of the ESA itself, but failing to use the ESA in this manner, when every tool available is needed to combat climate change, carries an even greater risk to the viability of our planet.

9. Interagency Cooperation Under the Endangered Species Act, 73 Fed. Reg. 76272 (Dec. 16, 2008). Defenders of Wildlife and other conservation organizations sued to overturn this regulation and the polar bear regulation noted above. Cf. Press Release, Defenders of Wildlife, Bush Administration Takes Parting Shot at Endangered Wildlife (Dec. 11, 2008) *available at* [http://www.defenders.org/newsroom/press\\_releases\\_folder/2008/12\\_11\\_2008\\_bush\\_administration\\_takes\\_parting\\_shot\\_at\\_endangered\\_wildlife.php](http://www.defenders.org/newsroom/press_releases_folder/2008/12_11_2008_bush_administration_takes_parting_shot_at_endangered_wildlife.php) (describing Bush Administration ESA regulations and Defenders of Wildlife's intent to take legal action against the regulations). The Obama Administration withdrew the Bush Administration's §7 regulations. See Interagency Cooperation Under the Endangered Species Act, 74 Fed. Reg. 20421 (May 4, 2009).

10. 42 U.S.C. §§7401-7671q, ELR STAT. CAA §§101-618.