Climate Change in the Endangered Species Act: A Jurisprudential Enigma

by Barry Kellman

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Climate change exposes 20-30% of plant and animal species to an increased risk of extinction in this century. According to the International Union for Conservation of Nature (IUCN), more than 22,000 species may be in jeopardy worldwide.[1] It is not clear which species will be most affected. Large mammals at or near the apex of a food chain (for example, bears) are vulnerable, but so are corals, among the least predatory animals on earth. It is especially unclear what will be the indirect consequences of loss of biodiversity: As an essential element in an ecosystem disappears, it is difficult to predict what impact that loss might have on the entire system. Adding complexity is the fact that climate change is not a single phenomenon but a combination of melting ice, ocean acidification, deforestation, and many other conditions.

What does seem clear is that the extinction will be massive, approaching if not one of the five great extinctions in earth's history, then perhaps on a scale of the second tier of extinctions identified by scientists. Also seemingly clear is that the climate change extinction will be rapid by geological standards, perhaps over only one century, and at a certain point will be essentially impossible to stop.[2]

In the United States, the only legal tool to protect against such a multispecies catastrophe is the Endangered Species Act (ESA).[3] This is unfortunate. There are fundamental incongruities between how the ESA has been conceived and the problems for species survival associated with climate change. When the ESA was drafted, no one could have foreseen climate change, much less thought seriously about how the ESA should address species loss on a warming earth. The ESA's mechanisms were designed to address types of threats—human physical encroachment on vulnerable species' habitat—that are simply not central to the threats posed by climate change.

In the typical ESA case, a species is in jeopardy of extinction due to human activity such as flooding land, mining, off-road vehicle use, or conducting military exercises. Over the four decades since the ESA's enactment, the logic of harm caused to species by human activity and the need, therefore, to curtail or regulate that activity has made sense. Invocations of the ESA have had to do with actions that could be controlled; they entailed decisions about whether to regulate some activity, where and how it should be done. When such situations have arisen, federal agencies (the Fish and Wildlife Service (FWS) in the U.S. Department of the Interior and the National Marine Fisheries Service (NMFS) (formerly NOAA Fisheries) in the U.S. Department of Commerce) have used their authority to prevent such disturbance, allowing the species to revive in its natural condition.

But climate change blows up the ESA's operative mandate for federal agencies to prevent human disturbance of especially vulnerable species. Species loss due to climate change operates on an altogether different paradigm, muddling all causal connections between human actions and harm to a particular species. Climate change means warmer temperatures, melting ice, rising seas, and perhaps more invasive competitors. For some species, survival entails relocating to cooler latitudes because rising temperatures disrupt the species' own metabolism or the availability of food, but relocation may not be a realistic option because of natural or human obstacles. For other species, survival may be jeopardized by changing topography that limits its ability to move throughout its domain. Yet other species may see their habitats shrunk by rising waters or may be victims of more frequent and intense storms.

Unlike traditional problems of preserving endangered species, there is no spatial connection between the cause of the jeopardy and the species' habitat—most greenhouse gases are emitted far from the areas that endangered species inhabit. In a warming planet, human disturbance has

Author's note: I would like to acknowledge the significant support of Casey Williams, J.D., DePaul University College of Law, 2017.

1. International Union for Conservation of Nature (IUCN), *Conservation Successes Overshadowed by More Species Decline: IUCN Red List Update* (2015), http://www.iucn.org/content/conservation-successes-overshadowed-more-species-declines-%E2%80%93-iucn-red-list-update.
2. There is an enormous amount of literature on species extinction due to climate change. *See generally* Elizabeth Kolbert, The Sixth Extinction: An Unnatural History (2014).
3. 16 U.S.C. §§1531-1544, ELR Stat. ESA §§2-18 (2012).

much less to do with physical encroachment into sensitive space than with disrupting ecosystems such that food resources and mating opportunities diminish, leading to eventual extinction. Shorn of any geographic connection between where adverse activity may occur and an endangered species' habitat, the question of what and how to regulate becomes ephemeral: How does one protect a habitat from activity that is global, with multiple causes and impacts?

My thesis is that this question poses unique and intellectually challenging dilemmas for courts. There is already enough case law involving the ESA's operation with regard to climate change to frame the legal issues,[4] but this is just the beginning. Without question, the quantity of litigation associated with the ESA and climate change will escalate into the foreseeable future, placing courts at the center of disputes that arguably are not within the scope of judicial competence. Whether this makes sense—whether judicial intervention serves or undermines efforts to preserve species from the effects of a warming planet—is a question that deserves careful analysis.

The ESA-climate change cases discussed here deserve attention. For one thing, each case focuses on a mammal that is esteemed for having so adeptly adapted to its unique environment even as that environment vanishes. Each case entails a clash of hefty interests with potential political as well as economic ramifications. Each raises scientific questions at the edge of what is understood about climate change. And each raises perplexing doctrinal questions about when courts should defer to federal agencies. Here are disputes that ask courts to weigh in on the condition of planet earth that will be inherited by its residents circa 2100, to rule on whether our children's children will enjoy anything like the species diversity that we enjoy now. Judicial decisions about how climate change affects legal responsibilities under the ESA are, therefore, rare examples of law operating at its most farsighted dimension, posing questions as apt for metaphysics as for jurisprudence.

This Comment begins with a brief explanation of the ESA issues that recurrently arise in the case law involving climate change. Then, I analyze six recent cases and find that the courts, in general, are confused about how to answer these issues. I end by trying to find some coherence in these decisions for the escalating litigation to come.

I. The ESA and Climate Change

The case law on the ESA and climate change highlights two primary questions as to: (1) *when* a species should be listed as endangered (or threatened) because of climate change threats to its survival, and (2) *what actions* should be taken to preserve a listed species from the impacts of climate change.

A. *Imminence of Endangerment in the Climate Change Context*

In the logic of the ESA, the first question is whether a species should be listed as endangered or threatened. The ESA offers no assistance to species on anything like a graduated or nuanced scale; a species that might be adversely affected or precarious, if not endangered or threatened, receives none of the ESA's protections. The ESA contains no mechanism by which an agency might determine that 10 or 100 valuable species deserve protection in a changing habitat, unless at least one of them passes the threshold of endangerment.

Endangerment is not easily determined. Listing entails an extremely sophisticated and time-consuming regulatory process, starting either on an agency's own initiative (about 20% of the time) or by citizen petition (about 80%). Of listings initiated by citizen petition, about one-half proceed only after a lawsuit is filed.[5] Once the process is initiated, the agency must undertake a status review of the species—that is, an assessment of its plight, population trend, and threats. If the conclusion of that assessment is that listing is warranted, the agency may either put the species on the "candidate list" or issue an official proposal to list the species. Many decisions are the product of years of deliberations. Today, over 2,000 species are listed as endangered or threatened.[6]

4. In addition to the cases discussed in this Comment, note should be made of the following decisions that also consider the climate change impacts on endangered species. In *National Wildlife Fed'n v. National Marine Fisheries Serv.* (NMFS), 2016 WL 2353647, 2016 U.S. Dist. LEXIS 59195 (D. Or. May 4, 2016), the plaintiffs challenged the issuance of a Biological Opinion (BiOp) concerning the impacts on salmon of the Federal Columbia River Power System (FCRPS). The court ruled that the effects of climate change were not adequately assessed, nor did NOAA Fisheries' analysis apply the best available science. Similarly, in *South Yuba River Citizens League v. NMFS*, 723 F. Supp. 2d 1247 (E.D. Cal. 2010), NMFS' BiOp concerning the U.S. Army Corps of Engineers' plans to dam and divert the Yuba River's impact on endangered salmon species was held inadequate for not addressing whether global warming will alter the temperature that results from a given flow regime. In *Humane Society of the United States v. Pritzker*, 75 F. Supp. 3d 1, 44 ELR 20247 (D.D.C. 2014), the plaintiffs' motion that NMFS reconsider its decision to not list as threatened the porbeagle shark was granted; the plaintiffs had raised climate change-induced stresses on the sharks, but this contention was not material to the decision. In *Center for Biological Diversity v. NMFS*, 977 F. Supp. 2d 55 (D.P.R. 2013), the plaintiff's motion for clarification was denied. In *Center for Biological Diversity v. NMFS*, 2016 WL 452137, 2016 U.S. Dist. LEXIS 14601 (D.P.R. Feb. 5, 2016), the court rejected a challenge to an NMFS "no jeopardy" determination with regard to authorizing a fishery that would allow fishing of parrotfish, a feeder on algae that in turn feed on coral, which is under severe stress due to climate change. In *Oceana, Inc. v. Pritzker*, 125 F. Supp. 3d 232 (D.D.C. 2015), the court refused to find inadequate NOAA Fisheries' determination that operation of seven fisheries, in cumulative impact with climate change, would not jeopardize endangered loggerhead turtles. And in *Turtle Island Restoration Network v. U.S. Dep't of Commerce*, 2013 WL 4511314, 2013 U.S. Dist. LEXIS 120123 (D. Haw. 2013), *appeal docketed*, No. 13-17123 (9th Cir. 2013) (oral argument held June 20, 2016), the court upheld NOAA Fisheries' issuance of an incidental take permit with regard to shallow-set longline fishing for swordfish; in its BiOp, NOAA Fisheries had determined that there is great uncertainty with regard to the cumulative effects of climate change on endangered sea turtle populations.

5. Michael P. Senatore & Kieran Suckling, Defenders of Wildlife & Center for Biological Diversity, Conservation in Action: Safeguarding Citizen Rights Under the Endangered Species Act (2001).

6. FWS data shows 1,589 listed species native to the United States, and 657 foreign species. FWS, *Listed Species Boxscore*, http://ecos.fws.gov/tess_

Inherent in the process of determining endangerment is a question of timing: How imminent is endangerment? On a long-enough time horizon, perhaps every species is endangered, but such fatuity ill-serves the goal of species conservation. Under the ESA, a species should be listed only when the agency determines that its endangerment is imminent. Yet, the ESA itself offers no time frame with regard to the speed of endangerment. The conditions causing or threatening endangerment must be current or in the foreseeable future, but how quickly those conditions must lead to extinction is not statutorily clarified.

Imminence of endangerment has been understood to pertain to how certain it is that human activity will cause irremediable harm to a species, and the imperative to prevent that harm through regulation. In typical listing determinations, prospective actions (building a dam or beachfront condos, logging, diverting water streams) can have a direct, foreseeable, and indeed imminent impact on the survival of a species. Yet, even in these contexts, determining whether the species is on its last legs and therefore should be listed is rarely a simple matter of applying crystal-clear metrics.

The phenomenon of climate change and the effects it will have on vulnerable species, however, operate on an altogether different temporal paradigm. Tomorrow's endangerments induced by climate change are the product of actions taken long before there was much appreciation of how burning fossil fuels would imperil species survival. Looking forward, the causal chain between a warming environment and a species' endangerment might take many decades or longer to unfold.

Longer time projections mean more ambiguity about outcomes. If the species' endangerment is very far off, perhaps as much as one century, what does that time scale suggest about the likelihood of endangerment? This question magnifies the unprecedented complexity and inherent uncertainty about climate change's impacts on life on earth. Truly, however, the imminence of endangerment that many species face due to climate change is not fixed; likely, each affected species will become endangered on its own unique time frame. With regard to some species, however, such a sad outcome is avoidable only if conservation action is initiated now.

The issue of imminence of endangerment is a law professor's dream: How should *foreseeability* be assessed with regard to perhaps the most complex phenomena that humanity has ever confronted, and what should be the agencies' legal authority that follows from any such assessment? And within this abstract question of environmental governance are literally dozens of important questions of administrative law, evidence, causation, and legal responsibility for future harm. As will be shown, however, the courts' review of imminence of endangerment manifests no analysis of when regulatory action is appropriate to save species, nor do these cases reveal much that might enable reasonable prediction of tomorrow's cases about listing endangered species. While most of us understand that fossil fuel combustion is warming the planet and putting many species under inordinate stress, to parse that climate-induced catastrophe within the terminology of the ESA listing process has something of a "square peg in a round hole" quality. Pound as one might, it is not a good fit.

B. Appropriate Action to Enable Species Recovery

From a species' perspective, being listed as endangered means little in and of itself; listing is important only to the extent that the listed species is subject to conservation regulations that constrain the human activity jeopardizing the species' survival.

ESA §4(1) authorizes FWS and NOAA Fisheries to develop and implement recovery plans for the species' benefit. Recovery plans are blueprints to guide the government in bringing listed species to a self-sustaining level.[7] Key to recovery plans is designation of critical habitat—areas with primary constituent elements (PCE) essential to a listed species that may require special management and protection if the species is to survive and recover.[8] In designating critical habitat, FWS or NOAA Fisheries must use the best scientific data available.[9] In addition, the critical habitat designation process must include an economic analysis of positive and negative impacts of the designation; indeed, an area may be excluded if the benefits of exclusion outweigh the benefits of designating the area, unless the exclusion would result in the extinction of the species.[10] The ESA is mute about how such costs and benefits are to be determined.

With regard to listed species, every federal agency must, under §7(2), undertake a "no jeopardy" determination so as to ensure that their actions do not jeopardize endangered or threatened species or result in the destruction or adverse modification of habitat of such species.[11] Where the consulting agency concludes that the agency action is not

public/reports/box-score-report (last visited Feb. 11, 2016).

7. Recovery plans should include: (1) a description of site-specific management plans that may be necessary to achieve conservation and survival of the species; (2) a recovery objective (i.e., a target population number) and a list of criteria for indicating when the objective has been achieved; an implementation schedule with task priorities and cost estimates; and (3) a recovery plan may also call for species reintroduction, habitat acquisition, captive propagation, habitat restoration and protection, population assessments, research and technical assistance for landowners, and public education. ESA §4(f)(10(B); 16 U.S.C. §1533 (f)(1)(B).
8. To determine what exactly is "critical habitat," the needs of open space for individual and population growth, food, water, light, or other nutritional requirements, breeding sites, seed germination and dispersal needs, and lack of disturbances are considered. 50 C.F.R. §424.12(b).
9. ESA §4(b)(2), 16 U.S.C. §1533(b)(2) (2012).
10. *Id.*
11. 16 U.S.C. §1536(a)(2). When the BiOp concludes that jeopardy is likely to result from the action under review, the agency must either terminate the action, implement the proposed alternative, or seek an exemption from the Cabinet-level Endangered Species Committee pursuant to 16 U.S.C. §1536(e). Where the consulting agency concludes that the agency action is not likely to jeopardize the continued existence of the species but is nonetheless likely to result in some incidental take, the BiOp must set forth an ITS, which specifies the permissible "amount or extent" of this impact on the species. 16 U.S.C. §1536(b)(4); 50 C.F.R. §402.14(i). In formulating a BiOp, FWS and NMFS must "use the best scientific and commercial data available." 16 U.S.C. §1536(a)(2); 50 C.F.R. §402.14(g)(8).

likely to jeopardize the continued existence of the species but is nonetheless likely to result in some "incidental take," the biological opinion (BiOp) must set forth an incidental take statement (ITS), which specifies the permissible "amount or extent" of this impact on the species.[12] In formulating a BiOp, agencies must "use the best scientific and commercial data available."[13]

For purposes of this brief discussion, the last question under the ESA is determining when an endangered species has recovered such that it no longer needs the ESA's protection (or when it has become extinct); if so, the species is "delisted" from the endangered species list. To delist or downlist a species, the government must determine that a species is not threatened or endangered based on the factors outlined in the listing process. In addition, the government must also meet the goals established in the recovery planning process, such as population size, reproductive success, and habitat protection.

As with regard to listing determinations, the design of recovery actions to conserve a species has, in the past, suggested that the species' endangerment is proximately caused by some specifiable human conduct. But with climate change, any causal connection between behavior and consequent harm to species is understandable only at the aggregate level, which again would seem to present issues outside the normal parameters of judicial competence to resolve clearly framed disputes. The fundamental problem is that the ESA rests on preservation of species from intrusion into critical habitat, but this paradigm does not reflect the pressures on species due to climate change.

II. Cases on the ESA and Climate Change

This discussion focuses on six recent decisions involving polar bears, ribbon seals, bearded seals, wolverines, and grizzly bears. In the end, polar bears receive some actual protection, ribbon seals do not, and agency determinations with regard to bearded seals, wolverines, and grizzly bears are remanded for further consideration. Each decision, viewed in isolation, has its merits and flaws. Viewed collectively, however, there is neither biological justification nor consistent application of legal doctrine that rationalizes why some of these animals get legal protection under the ESA but others do not. Such are the unsettled fortunes of animals trying to survive in a warming climate.

A. *Polar Bears*[14]

Approximately 20,000-25,000 polar bears, distributed in 19 populations, live throughout the Northern Hemisphere's ice-covered regions where warming temperatures are accelerating the pace of ice melt. Polar bears live on ice year-round, depending on it to hunt prey, breed, and den; they cannot survive when such ice is absent or weakened. Bears show a preference for sea ice located over and near the continental shelf, and are most abundant near the shore in shallow-water areas where currents and ocean upwelling increase marine productivity and keep the ice cover from becoming too consolidated in winter. Decreased sea ice thickness has already forced polar bears to travel farther to find food, and some bears have been stranded at sea when the ice shelf hunting habitat has broken off from the mainland. Scientific estimates showed that one of the 19 polar bear populations is increasing in numbers, six populations are stable, and three populations are declining (the remaining nine are data-deficient).[15]

FWS listed the polar bear as "threatened" in 2008, the first species to be listed as threatened with endangerment under the ESA due to climate change. Specifically, FWS found that all polar bear populations will be affected by substantial losses of sea ice within the foreseeable future (which the agency defined as 45 years), although different populations will be affected at different rates and to different degrees. Ultimately, the continuing decline of polar bears' critical habitat for the foreseeable future "threaten[s] the species throughout all of its range."[16] While significant reduction of sea ice was cited as the reason for the listing, FWS was careful not to mention the contribution of fossil-fuel combustion. Along with the listing, a rule was announced allowing activities associated with carbon emissions to continue. The ESA, stated Interior Secretary Dirk Kempthorne, was not intended to fight climate change.[17]

12. 16 U.S.C. §1536(b)(4); 50 C.F.R. §402.14(i).
13. 16 U.S.C. §1536(a)(2); 50 C.F.R. §402.14(g)(8).
14. In re Polar Bear Endangered Species Act Listing and Section 4(d) Rule Litigation, MDL No. 1993; Safari Club Int'l v. Salazar, 709 F.3d 1 (D.C. Cir. 2013). In 2005, the Center for Biological Diversity petitioned FWS to list the polar bear. After a three-year rulemaking process FWS listed the polar bear as "threatened" due to the risks presented by climate change. *See* Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Polar Bear (Ursus maritimus) Throughout Its Range, 73 Fed. Reg. 28212 (May 15, 2008). Several groups challenged the listing as either over- or underinclusive; the cases were consolidated in the U.S. District Court for the District of Columbia, where summary judgment was granted to FWS. In re Polar Bear Endangered Species Act Listing and Rule 4(d) Litigation, 794 F. Supp. 2d 65, 41 ELR 20220 (D.D.C. 2011). Following the D.C. Circuit decision, the U.S. Supreme Court denied certiorari. Safari Club Int'l v. Jewell, 134 S. Ct. 310 (2013).

    Also, in *Center for Biological Diversity v. Salazar*, 695 F.3d 893, 42 ELR 20178 (9th Cir. 2012), the U.S. Court of Appeals for the Ninth Circuit upheld an FWS incidental take regulation of polar bears, holding that FWS' "small numbers" and "negligible impact" analysis deserved deference. *Id.* Similarly, the Ninth Circuit has previously upheld incidental take regulations concerning polar bears and the threats posed by both climate change and oil and gas activities. Center for Biological Diversity v. Kempthorne, 588 F.3d 701, 40 ELR 20280 (9th Cir. 2009).
15. Figures are for 2014. *See* World Wildlife Federation, *Polar Bear Status, Distribution & Population*, http://wwf.panda.org/what_we_do/where_we_work/arctic/wildlife/polar_bear/population/ (last visited Aug. 23, 2016).
16. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Polar Bear (Ursus maritimus) Throughout Its Range 73 Fed. Reg. 28212 (proposed May 15, 2008) (codified at 50 C.F.R. §17.40(q)).
17. News Release, U.S. Dep't of Interior, Secretary Kempthorne Proposes Narrow Changes to ESA Consultation Process (Aug. 11, 2008), https://www.doi.gov/sites/doi.gov/files/archive/news/archive/08_News_Releases/080811a.html. In 2009, a new Secretary of the Interior rescinded this broad rule but left in place the special polar bear rule, leaving unaffected the climate change-causing activities that are jeopardizing the bears' survival. News Release, FWS, Salazar Retains Conservation Rule for Polar Bears (May 8, 2009), http://www.fws.gov/news/ShowNews.cfm?newsId=20FB90B6-A188-DB01-04788E0892D91701.

Polar bears were deemed only "threatened" because a species must be in "imminent danger" of extinction before being listed as "endangered."[18] This logic evoked challenges both from environmentalists, including the Center for Biological Diversity (CBD), and from industrial interests.[19] For its part, CBD objected to FWS' finding that polar bears are not currently *endangered* because a species must be in "imminent danger" of extinction before being so listed.[20] The CBD argued that FWS' introduction of a requirement of imminence to a finding of endangerment disregarded the degree of expected habitat degradation that will occur due to climate change.

The D.C. district court upheld FWS' interpretation of the ESA on basic deference grounds, but remanded for a more sufficient explanation of the indicia of endangerment.[21] On remand, the FWS "Supplemental Explanation" stipulated that a temporal element—the concept of imminence—is an inherent part of the distinction between the threatened and endangered species: "In danger of extinction" means "currently on the brink of extinction in the wild," considering the threats facing the species and its response to those threats.[22]

A group of industrial and state interests appealed the listing, alleging that FWS misinterpreted and misapplied the record, principally with respect to the foreseeability of harm. The district court rejected these claims.[23] In 2013, the D.C. Circuit rejected the appeal, finding that FWS had "clearly explained how the anticipated habitat loss renders this particular species likely to become endangered."[24] Significantly, the court upheld the FWS decision to use 45 years, based on climate models about warming and sea ice trends, as the appropriate time period for determining whether the species was likely to become endangered in the foreseeable future, finding that what constitutes the foreseeable future is for FWS to determine on a case-by-case basis.[25] Thus, in the end, polar bears are listed as threatened with endangerment.

18. 73 Fed. Reg. at 28238.
19. Polar Bear Endangered Species Act Listing and §4(d) Rule Litigation, 748 F. Supp. 2d 19, 40 ELR 20008 (D.D.C. 2010).
20. *Id.* at 25. FWS identified four categories of "endangered" species as species: (1) "facing a catastrophic threat from which the risk of extinction is imminent and certain"; (2) facing an elevated vulnerability to narrowly restricted endemics; (3) that have been reduced to critically low numbers or restricted ranges, and (4) that have suffered ongoing major reductions in numbers or range. Memorandum From the Dep't of Interior Acting Dir. to the Polar Bear Listing Determination File 4-6 (Dec. 22, 2010), https://www.fws.gov/ENDANGERED/esa-library/pdf/20101222_Polar%20bear%20listing%20clarification%20memo.pdf. Each of the four categories proffered in FWS' Supplemental Explanation focuses heavily on the species' current biological status and assumes a relatively short period of time between the species' expected extinction and agency action. *Id.*
21. 748 F. Supp. 2d at 30-31.
22. Memorandum From the Dep't of Interior Acting Dir. to the Polar Bear Listing Determination File at 3 (Dec. 22, 2010), https://www.fws.gov/ENDANGERED/esa-library/pdf/20101222_Polar%20bear%20listing%20clarification%20memo.pdf.
23. In re Polar Bear Endangered Species Act Listing and §4(d) Rule Litigation, 794 F. Supp. 2d 65, 41 ELR 20220 (D.D.C. 2011).
24. In re Polar Bear Endangered Species Act Listing and Section 4(d) Rule Litigation, MDL No. 1993; Safari Club Int'l v. Salazar, 709 F.3d 1 (D.C. Cir. 2013).
25. *Id.* at 15-16.

B. Polar Bears: Round Two

The U.S. Court of Appeals for the Ninth Circuit's 2016 decision in *Alaska Oil & Gas Ass'n v. Jewell*[26] is certainly among the most important recent ESA-climate change cases. In 2010, FWS designated approximately 187,000 square miles of Alaska's coast and waters (an area larger than the state of California) as critical habitat for the polar bear.[27] Oil and gas trade associations, several Alaska Native corporations and villages, and the state of Alaska claimed that the designation of critical habitat will deprive them of opportunities to use the natural resources in Alaska's waters and North Slope that make up much of the designated habitat. According to the plaintiffs, FWS "failed to harmonize inconsistent findings when it determined that the PCEs essential to the polar bear may require special management considerations or protection, while also stating that the designation of critical habitat would not result in changes to polar bear conservation requirements."[28]

In dispute was only 4.1% of the total area specifically designated as terrestrial denning and barrier island habitats where no human disturbance would be tolerated. Terrestrial denning habitats have steep slopes, access to the coast, and proximity to sea ice. These habitats require protection, according to FWS, given polar bears' slow reproductive rate and sensitivity to human disturbance during denning. Because Alaska's coastal barrier islands and their surrounding waters have the essential physical and biological features for polar bears, they regularly use the islands as places to feed, den, rest, and migrate along the coast. The Native villages of Barrow and Kaktovik, along with all man-made structures within the critical habitat, were excluded from the critical habitat designation because they do not contain the physical and biological features essential to the polar bear. FWS chose not to exclude any other areas on the basis of the probable economic impact, finding that such impact was negligible. Alaska Governor Sean Parnell, however, said the critical habitat designation included areas that account for almost one-half of Alaska's oil production and would delay or restrict petroleum exploration and production.

The district court had granted summary judgment to the plaintiffs for FWS' failure to identify specifically where and how existing polar bears use the relatively small portion of critical habitat designated as Units 2 and 3.[29] Ruled the district court, "[FWS] has not shown, and the record does not contain," evidence that Units 2 and 3 contain all of the required features of terrestrial denning and barrier island habitats.[30] The district court concluded that FWS, once it had designated the species as threatened, was obli-

26. Alaska Oil & Gas Ass'n v. Jewell, 815 F.3d 544, 46 ELR 20042 (9th Cir. 2016).
27. *Id.* at 552; 75 Fed. Reg. 76086 (Dec. 7, 2010).
28. *Alaska Oil & Gas*, 815 F.3d at 564.
29. Alaska Oil & Gas Ass'n v. Salazar, 916 F. Supp. 2d 974, 43 ELR 20013 (D. Alaska 2013), *rev'd and remanded*, 815 F.3d 544, 46 ELR 20042 (9th Cir. 2016).
30. 916 F. Supp. 2d at 1002-03.

gated to determine where, within the polar bears' occupied range, the physical or biological features essential to polar bear conservation are found. But, ruled the district court, FWS had failed to show specifically where within Units 2 and 3 those PCEs were located.

The Ninth Circuit disagreed, holding that the ESA does not require the level of specificity that the district court characterized as obligatory. The Ninth Circuit stated:

> By requiring proof of existing polar bear activity, the district court impermissibly shifted the focus of the critical habitat designation away from the PCEs. Since the point of the ESA is to ensure the species' recovery, it makes little sense to limit its protections to the habitat that the existing, threatened population currently uses. The district court's construction of the critical habitat requirements thus contravenes the ESA's conservation purposes by excluding habitat necessary to species recovery.[31]

The standard that FWS followed, looking to areas that contained the constituent elements required for sustained preservation of polar bears, was in accordance with statutory purpose and hence could not have been arbitrary, capricious, or contrary to law.

The Ninth Circuit stated that FWS undertook a formal Final Economic Analysis, as required by §4(b)(2), in which it considered potential indirect costs of the designation arising from delay, litigation, uncertainty and risk, and more. FWS chose to address these impacts qualitatively rather than quantitatively because they were too uncertain to include in the final calculation, concluding that it could not foresee any additional expense for affected parties. The Ninth Circuit held that it was within FWS' discretion not to include those costs deemed too uncertain or speculative in the total potential incremental cost of the designation.[32]

The plaintiffs had further asserted that future climate change is not an appropriate consideration under the ESA and that FWS may only designate habitat that contains essential features at the time the species is listed, not habitat that may become critical in the future because of climate change or other potential factors. According to the plaintiffs, FWS produced no evidence to explain how the proposed critical habitat is currently eroding due to climate change, nor had FWS sufficiently connected evidence of climate change to its decision. The plaintiffs instead asserted that FWS relied on mere speculation that climate change would cause areas with PCEs to erode in the future.

The Ninth Circuit, referring to the D.C. Circuit's opinion in *In re Polar Bear Listing*,[33] found that FWS relied on numerous published studies and reports describing the effects of climate change, and it explained that the rapid retreat of sea ice in the Arctic is "unequivocal and extensively documented in scientific literature."[34] Because of global climate change, the extent and quality of Arctic sea ice is declining, and the polar bear population is declining with it due to "nutritional stress caused by diminished numbers of ice-dependent prey, decreased access to the prey that remain, shorter hunting seasons and longer periods of fasting onshore, higher energetic demands for travel and obtaining food, and more negative interactions with humans."[35] FWS further explained that a majority of state-of-the-art climate models predict that the Arctic will be seasonally ice-free by the middle of the 21st century, about 30 years ahead of the modeled values, suggesting a seasonally ice-free Arctic may come far sooner than expected. According to the Ninth Circuit, FWS properly took all of this information into account in designating critical polar bear habitat.[36]

C. *Ribbon Seals*

Two recent decisions have contested whether subpopulations of seals should be listed under the ESA. In both cases the facts of the seals' adverse condition were substantially similar, as were the causes of that condition: diminishing sea ice due to climate change. The primary difference between the two cases was how the legal issue was framed.

With regard to ribbon seals, in *Center for Biological Diversity v. Lubchenco*,[37] NMFS had decided to not list the ribbon seal as endangered.[38] At issue were the subpopulations of approximately 49,000 ribbon seals in the eastern and central Bering Sea. As with any seal population, the prospect of diminished ocean ice raises concerns about jeopardy to the group's survival. NMFS had found, however, that this population of ribbon seals did not deserve listing as endangered or threatened. Experts within NMFS concluded that the ribbon seal is not endangered through the foreseeable future, circa 2050, although as every litigant readily agreed, the evidence was neither copious nor unambiguous. According to the court:

> NMFS determined the foreseeable future to be to the year 2050 because past and current emissions of greenhouse gases have already largely set the course for changes in the atmosphere and climate until that time, and because of enormous uncertainty about future social and political decisions on emissions that will dominate projection of conditions farther into the future. Beyond the year 2050, projections of climate scenarios are too heavily dependent on socio-economic assumptions and are therefore too

31. 815 F.3d at 555-56.
32. *Id.* at 564.
33. In re Polar Bear Endangered Species Act Listing and Section 4(d) Rule Litigation, MDL No. 1993; Safari Club Int'l v. Salazar, 709 F.3d 1 (D.C. Cir. 2013).
34. *Alaska Oil & Gas*, 815 F.3d at 559 (quoting *In re Polar Bear Listing*, 709 F.3d at 6).
35. *Id.* at 552.
36. *Id.* at 559.
37. 758 F. Supp. 2d 945 (N.D. Cal. 2010).
38. *Id.* at 948; Endangered and Threatened Wildlife; Notice of 12-Month Finding on a Petition to List the Ribbon Seal as a Threatened or Endangered Species, 73 Fed. Reg. 79822 (Dec. 30, 2008).

> divergent for reliable use in assessing threats to ribbon seals.[39]

The plaintiffs argued that NMFS violated the ESA by limiting the foreseeable future to 2050 and by not considering impacts to the end of the century[40]; deferring protection of the ribbon seal until some time in the future will effectively condemn the species to extinction. The court ruled that the plaintiffs did not show that NMFS' reasons for designating 2050 as the foreseeable future were arbitrary and capricious.

Importantly, the court agreed with NMFS that: "There is no evidence that the inadequacy of existing regulatory mechanisms currently poses a threat to ribbon seals. However, there are no known regulatory mechanisms which effectively address reductions in sea ice habitat at this time."[41] Finally, NMFS designated the ribbon seal as a "Species of Concern," which permits NMFS to act quickly if new information comes to light or NMFS' projections are disproved.

D. Bearded Seals

The second seal case, *Alaska Oil & Gas Ass'n v. Pritzker*,[42] was factually similar to *Lubchenco*, but the legal dispute arose differently. At issue were the Bering Okhotsk district population of about 155,000 bearded seals, which NMFS had decided to list as threatened.[43] NMFS predicted that these populations, although moderately large, faced compromised reproduction and survival rates because sea ice melt would force them to move to potentially unsuitable habitats. But, admitted NMFS, a lack of quantitative information linking climate change to bearded seal vital rates rendered uncertain the risks of widespread habitat loss to bearded seals' survival; NMFS admitted to not being able to detect even major changes in bearded seal population size.

Because the dispute was prompted by NMFS' affirmative determination to list the bearded seals, legal challenges came from oil and gas development interests to the effect that NMFS' determination was flawed because of: "(1) uncertainty and lack of information to support the listing," including failure to link its sea ice projections to habitat changes, biological functions, and population changes; and (2) improper use of a 100-year projection into the future.[44] The challengers argued that listing the seals as threatened would trigger several protective provisions of the ESA: The consultation obligations under ESA §7(a)(2) would apply to "permits and authorizations relating to coastal development and habitat alteration, oil and gas development (including seismic exploration), toxic waste and other pollutant discharges, and cooperative agreements for subsistence harvest."[45] Notably, the potential threats posed by pollutants, oil and gas industry activities, fisheries, and shipping were not found to pose a risk of endangering the seals, individually or collectively, in the foreseeable future.[46]

The Alaska district court found that

> it does not appear from the Listing Rule that any serious threat of a reduction in the population of the Beringia DPS, let alone extinction, exists prior to the end of the 21st century. Indeed, the Listing Rule itself concedes that, at least through mid-21st century, there will be sufficient sea-ice to sustain the Beringia DPS at or near its current population levels. Indeed, with respect to the second half of the century it appears that no significant threat to the Beringia DPS is contemplated before 2090. . . . Under the facts in this case, forecasting more than 50 years into the future is simply too speculative and remote to support a determination that the bearded seal is in danger of becoming extinct.[47]

Therefore, "[a] listing under the ESA based upon speculation, that provides no additional action intended to preserve the continued existence of the listed species, is inherently arbitrary and capricious."[48]

E. Wolverines

Wolverines may be described as a relic of the northern hemisphere's last ice age, custom-built for life in mountainous, snowy environments. In the contiguous United States (the southern portion of its range where temperatures are warmest) live fewer than 300 individuals, distributed among a network of small subpopulations on mountaintops where snow persists through the denning season at a minimum depth of five feet. As some of the subpopulations contain fewer than 10 individuals, wolverines require gene flow among subpopulations, which necessarily entails migration of individuals. But as wolverines prefer to move across suitable habitat having persistent spring snow cover, they are especially sensitive to reduction of areas of persistent spring snow cover due to climate change; range losses for the wolverine further expose them to the dangers of genetic homogeneity.

Legal consideration of whether to list the wolverine as a threatened or endangered species goes back over 20 years,

39. *Center for Biological Diversity*, 758 F. Supp. 2d at 963-64 (quoting 73 Fed. Reg. 79823).
40. Specifically, the plaintiffs asserted that NMFS:
> (1) irrationally dismissed universally-accepted Intergovernmental Panel on Climate Change (IPCC) climate scenarios as too variable to be foreseeable; (2) illegally relied on uncertain future regulatory measures to conjure a false appearance of uncertainty; (3) disregarded the fact that all climate scenarios are worse for the ribbon seal after 2050; (4) ignored the frequent prior use of timeframes of 100 years or more to determine species status; (5) instituted a standard by which ribbon seals will be doomed to extinction before ESA protections can kick in; and (6) arbitrarily ignored ocean acidification impacts beyond 2050 that NMFS itself has foreseen.

Id. at 963.
41. *Id.* at 966. Worth noting was a quite distinct issue about what, if anything, to do about Russian tolerance of ribbon seal hunting on its side of the straits.
42. 2014 WL 3726121 (D. Alaska July 25, 2014), *appeal docketed*, No. 14-35811 (9th Cir. Sept. 29, 2014) (oral hearing held Aug. 4, 2016).
43. 77 Fed. Reg. 76740, 76748 (Dec. 28, 2008).
44. *Pritzker*, 2014 WL 3726121, at *11.
45. *Id.* at *7 (quoting 77 Fed. Reg. at 76765).
46. *Id.* at *15.
47. *Id.*
48. *Id.* at *16.

but the issue in *Defenders of Wildlife v. v. Jewell*[49] concerned FWS' withdrawal in 2014 of its proposed rule that would have designated wolverines in the United States as a threatened species. The proposed rule significantly relied on two studies predicting that climate change will reduce wolverine habitat and range by 31% over the next 30 years and 63% over the next 75 years. Declining spring snow cover is expected to "create many small and isolated [wolverine] populations that would be subject to high levels of demographic and genetic stochasticity."[50] With regard to the uncertainty of data, experts claimed, "While we recognize there is uncertainty associated with when population effects may manifest themselves, any conclusion that there will not be population effects appears to be based on opinion and speculation. In our opinion that would not represent the best available scientific or commercial data available."[51]

FWS, when issuing its proposed rule, asserted that "maintenance of the contiguous United States wolverine population in the currently occupied area may require human intervention to facilitate genetic exchange[.]"[52] Accordingly, designation of wolverines as threatened with endangerment "will indirectly enhance national and international cooperation and coordination of conservation efforts, enhance research programs, and encourage the development of mitigation measures that could help slow habitat loss and population declines."[53]

FWS withdrew the proposed rule, however, concluding that while there was significant evidence the warming climate within the wolverine's range affects snow patterns and associated wolverine habitat, "the biological response of wolverine populations to such changes, however, cannot reasonably be deduced with an acceptable degree of certainty."[54] FWS noted that wolverines are believed to be expanding and that den site availability is not currently limiting wolverines. FWS claimed to have insufficient information suggesting that deep snow is required by wolverines throughout their home ranges. FWS determined that even under conditions of future reduced snowpack as a consequence of climate change, sufficient habitat will likely remain to maintain the wolverine population at the current level of abundance, nor is there data suggesting that the anticipated changes put at risk the viability of wolverine populations in the contiguous United States.

The Montana district court, however, agreed with environmental advocates that FWS unlawfully ignored the best available science by dismissing the threat posed to the wolverine by climate change as well as by genetic isolation and small population size. As to FWS' claimed uncertainty about climate change's impact on wolverine reproductive denning, the court ruled that FWS arbitrarily and capriciously interpreted experts' analyses of declining snow cover. Moreover, FWS "sought certainty beyond what is required by the ESA and case law interpreting it when it demanded the precise mechanism behind the wolverine's established need for snow for reproductive denning purposes."[55] FWS acknowledged inappropriately low short- and long-term effective population sizes for the wolverine, as well as a documented loss of genetic diversity with no realistic hope of genetic infusion from Canadian populations. Rather than explain why these circumstances are no cause for alarm, FWS simply stated there was no threat because there was no data confirming a threat.

The court ruled:

> The Service's stance here borders on the absurd—if evidence shows that wolverines need snow for denning purposes, and the best available science projects a loss of snow as a result of climate where and when wolverines den, then what sense does it make to deny that climate change is a threat to the wolverine simply because research has yet to prove exactly why wolverines need snow for denning?[56]

Further, "[i]f ever there was a species for which conservation depends on foregoing absolute certainty, it is the wolverine."[57] For these reasons, the court found FWS' treatment of wolverine denning requirements in the withdrawal of its proposed rule to be arbitrary and capricious.

F. Grizzly Bears

Greater Yellowstone Coalition v. Servheen[58] concerned the delisting of the Yellowstone grizzly bear, which was listed as threatened in 1975 when its numbers had declined from 312 to 136 due to the closing of the open-pit garbage dumps (for fear of human-bear encounters) where Yellowstone grizzlies had come to scavenge scarce food resources. The 1982 recovery plan delineated "Recovery Zones" for each region occupied by grizzlies; observance of the plan led to the rebounding of the Yellowstone population. By 2006, there were over 500 Yellowstone grizzlies, approaching the region's carrying capacity. In 2007, the Final Conservation Strategy for the Grizzly Bear in the Greater Yellowstone Area established a 9,210-square-mile "Primary Conservation Area" as a secure area for grizzlies, limiting motorized access and other human activities to 1998 levels and establishing protocols for managing bear/human conflicts that emphasize removal of the human cause of conflict. The express purpose of the strategy was to enable the delisting of Yellowstone grizzlies.

Shortly thereafter, FWS removed the Yellowstone grizzly from the threatened species list, finding that the bears have a natural food source sufficient to survive and that adequate regulatory mechanisms are in place to maintain the recovered Yellowstone grizzly population without the ESA's staunch protections.[59] Environmental advocates challenged the delisting as failing to address the projected decline in

49. 2016 WL 1363865, 46 ELR 20070 (D. Mont. Apr. 4, 2016), *appeal docketed*, No. 16-53466 (9th Cir. June 6, 2016).
50. *Id.*, 2016 WL 1363865, at *6.
51. *Id.* at *13.
52. *Id.* at *6.
53. *Id.*
54. *Id.* at *15.
55. *Id.* at *22.
56. *Id.* at *23.
57. *Id.*
58. 665 F.3d 1015, 41 ELR 20347 (9th Cir. 2011).
59. 72 Fed. Reg. 14866 (Mar. 29, 2007).

white bark pine, a key source for grizzlies.[60] Indeed, FWS had recognized that stresses on the trees (beetles and blister rust) may be exacerbated by climate change and that there is a "well-documented association" between reduced white bark pine seed abundance and increased grizzly mortality and reduced grizzly reproduction.[61]

The issue before the Ninth Circuit was whether FWS was entitled to deference with regard to its conclusion that "any changes in white bark pine production . . . are not likely to impact the Yellowstone grizzly to the point where it is likely to become endangered within the foreseeable future,"[62] because (1) grizzlies will adapt their behavior to get food; (2) grizzly populations have rebounded despite pine cone production varying dramatically from year to year; and (3) even if projected white bark pine losses occur, there will still be adequate habitat in the Yellowstone region to support a recovered grizzly population. Ultimately, FWS claimed to not yet know what impact white bark pine declines may have on the Yellowstone grizzly, but based confidence on the bears' continued revitalization due to "adaptive management," which would enable appropriate management responses if grizzly populations are threatened.[63]

The court, however, found no explanation of what management responses might be reasonably likely to mitigate population declines caused by white bark loss. The strategy's intensive management and monitoring framework was not developed to be responsive to white bark pine declines, which was not among the threats the strategy was designed to address. According to the court, the delisting presented no data indicating that white bark pine declines will not threaten the Yellowstone grizzly population; yet considerable data, demonstrating a relationship between pine seed shortages, increased bear mortality, and decreased female reproductive success, pointed in the opposite direction.[64] The delisting process began years ago when the white bark pine loss was not apparent, "[b]ut now that this threat has emerged, the Service cannot take a full-speed ahead, damn-the-torpedoes approach to delisting."[65]

More recently, FWS again proposed to delist Yellowstone grizzlies, asserting that based on the best scientific and commercial data available "[t]he population is stable, threats are sufficiently minimized . . . [and] the distinct population segment of grizzly bears in the [Greater Yellowstone Ecosystem] has recovered and threats have been reduced such that this [distinct population segment] no longer meets the definition of threatened, or endangered, under the Act."[66] According to the Interagency Grizzly Bear Study Team (IGBST), bear population has plateaued, signifying that Yellowstone grizzlies are now at carrying capacity.[67] Considerable controversy has centered on delisting's implication for allowing hunting of bears outside national parks pursuant to state management plans.[68] As to the dangers associated with declines in white bark pine, IGBST found that, even with declining sustenance from pine seeds, grizzly bears have proven to be very adaptable omnivores and are able to switch to other food sources.[69]

III. Finding Analytic Coherence

These cases are difficult to reconcile. The following chart distinguishes them according to whether the legal challenge was about an agency decision to take action for the benefit of a species list or to not take action, and whether the reviewing court deferred to the agency or not.

	Agency Action to Conserve	Agency Decision to Not Act
Judicial Deference	Bears: *In re Polar Bear Listing*; *Alaska Oil & Gas Ass'n v. Jewell*	Ribbon Seals: *Center for Biological Diversity v. Lubchenco*
No Judicial Deference	Bearded Seals: *Alaska Oil & Gas Ass'n v. Pritzker*	Wolverines: *Defenders of Wildlife v. Jewell* Grizzly Bears: *Greater Yellowstone Coal. v. Servheen*

Distinguishing these cases is far easier than finding any consistent thread or theme. For example, the Alaska district court's opinion regarding bearded seals decreed that, with regard to whether bearded seals are threatened with endangerment, more than 50 years is too speculative and remote to support an endangerment determination. But the court did not elaborate any criteria of what is "too speculative and remote," and it ignored the obvious fact that this is nothing more than a judicial abrogation of a scientific determination as to which no court could possibly have expertise.

Ultimately, the cases discussed should be viewed from the species' perspective. In the polar bear cases, all that the courts did was defer to FWS. These decisions uphold the proposition that challenges to agency actions brought by industrial or resource extraction interests potentially affected by that action should evoke a broad presumption of judicial deference. This is why the judicial remand of the

60. Greater Yellowstone Coalition, Inc. v. Servheen, 672 F. Supp. 2d 1105, 39 ELR 20214 (D. Mont. Sept. 21, 2009), *aff'd in part, rev'd in part*, 665 F.3d 1015, 41 ELR 20347 (9th Cir. 2011).
61. *Greater Yellowstone*, 665 F.3d at 1025 (citing 72 Fed. Reg. at 14899).
62. *Id.* at 1024.
63. *Id.* at 1028-29.
64. *Id.* at 1020.
65. *Id.* at 1030.
66. Removing the Greater Yellowstone Ecosystem Population of Grizzly Bears From the Federal List of Endangered and Threatened Wildlife, 81 Fed. Reg. 13174 (proposed Mar. 11, 2016).
67. *See generally* Luke Whelan, *The Controversial Science Behind the Yellowstone Grizzly Losing ESA Protection*, Wired, May 29, 2016, *at* http://www.wired.com/2016/05/controversial-science-behind-yellowstone-grizzly-losing-esa-protection/.
68. If this proposed listing is finalized, the Greater Yellowstone grizzly will be classified as game for hunting. FWS anticipates that states will "desire to institute a carefully regulated hunt with ecosystem-wide coordinated total mortality limits[.]" 81 Fed. Reg. at 13201.
69. *See* IGBST, Response of Yellowstone Grizzly Bears to Changes in Food Resources: A Synthesis. Final Report to the Interagency Grizzly Bear Committee and Yellowstone Ecosystem Subcommittee (2013), *available at* https://pubs.er.usgs.gov/publication/70131502.

NMFS decision to list the bearded seals is most troubling of all these cases because it represents a judicial assessment of ambiguity that undermines the ESA's implementation.

Far less troubling is the decision to defer to NMFS to not list the ribbon seals. Although the legal distinction that led to the listing of the bearded seals but not the ribbon seals is not obvious, the court's decision regarding ribbon seals represents simple deference, whereas with regard to bearded seals, the court superseded NMFS on the question of whether a century-long time horizon was too remote and speculative—unquestionably the type of scientific determination that courts rhetorically are committed to leaving to federal agencies.

By the same logic, the stress on grizzly bears by the climate change-induced loss of white pine bark would seem a question better left to expert, not judicial, determination. What has happened, eventually, is that the 2009 judicial remand of the FWS decision to delist the grizzly bears has been superseded by the 2016 delisting, without much legal clarity as to why it took over six years to resolve this matter (presumably). Finally, and most difficult for this writer to look at through a deferential lens, is the decision to remand the determination to withdraw the listing of wolverines. It is sometimes important for species' representatives to challenge agency non-action; in these cases, judicial deference may be inappropriate. With regard to wolverines, there are various reasons to be skeptical of FWS' reasons for withdrawing listing—reasons that justify judicial nondeference on behalf of a very low-population and climate change-threatened species.

Altogether, the judicial vagary manifest in these decisions must slow and make more expensive the already overwhelming task of protecting vast numbers of species from extinction. This is a high price to pay as the number of potentially climate change-affected species escalates. Indeed, an examination of much of the law involving the ESA and climate change reveals judicial decisions that are, to a substantial extent, ungirded by any consistent doctrine that might lead to better policy execution forthwith. The law's contribution here does not include even asking piercing questions about what should be done to preserve each and every adversely affected species.

The analytical randomness of these decisions is evidence for my original proposition that the ESA is not at all well-designed to address biodiversity loss due to climate change. If any of these species is lost, what conceivable difference will it make whether the loss takes four decades or over one century, or whether the immediate cost of not excluding certain areas from a recovery plan is too expensive for today's oil interests? The more important questions have to do with how we can try to save these animals, but the ESA affords no overarching logic for addressing such matters.

Ultimately, the ESA is not a useful vehicle for exploring these questions through litigation. We may not be able to prevent a mass extinction in the near future, but expending substantial resources to litigate matters that divert attention from protecting many species affected by climate change may delay implementation of conservation measures, however imperfect. Like tempests in teapots, ESA litigation makes a pretense of the idea that law is making a positive contribution, but any such contribution is difficult for this writer to find. Instead, we find legal decisions that are copious, expensive, and accomplish no particular goals other than to occupy litigants' time and attention.

IV. Conclusion

By any measure, the threat of mass extinction due to climate change has erupted with enormous speed. The idea was not even on the radar screen of the ESA's drafters. They saw threats as particularized in time and space, and they authorized FWS and NOAA Fisheries to intervene on behalf of endangered species. It is no critique of what the ESA has accomplished to nevertheless assert the inaptness of that model to what is happening now and in the foreseeable future.

It would be a tragedy if our children's children envied us for our biodiversity, yet it is precisely such a shrunken world of life that we are heading toward. There are many important questions about what strategies should be developed for preserving the species that can be protected in a warming planet. Environmental lawyers can contribute by helping to think about how responsibilities should be assigned and what the scope of that authority is. These and many other difficult questions deserve more consistent analysis from the courts.

In a rational world, the U.S. Congress would develop new legislation to address climate change's impact on potentially endangered species. But this is a fantasy,[70] and these species are therefore left with nothing but the ESA to protect them, even though the discrepancies between how the ESA operates and the problem of climate change impacting these species has been widely noted. My thesis is that insightful development of legal doctrine would be helpful in the context of a looming mass extinction. Most important is for courts to view ESA and climate change issues through the lens of the species' interests at stake, not the economic interests that believe themselves to be at stake.

These cases are hardly the last word on how the ESA serves to protect endangered species from the impacts of climate change. At most, they are but the first of more, and potentially more complex, litigation on this topic to come.

70. Recent congressional proposals have been aimed at limiting the scope of the ESA to specify that it neither authorizes nor requires the regulation of climate change or global warming. *See, e.g.*, American Energy Renaissance Act of 2015, S. 791, 114th Cong. §7002 (2015).