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## THE SCIENCE CHARADE IN SPECIES CONSERVATION

Jonathan H. Adler\*

### INTRODUCTION

The Endangered Species Act (ESA) is among the nation’s most important and powerful environmental laws. It is also a source of great conflict and controversy.<sup>1</sup> The listing of individual species, the designation of critical habitat and the implementation of conservation measures often prompt fierce legal and political battles. In these conflicts, activists on all sides claim that “sound science” supports their respective positions, and scoff at the “junk science” relied upon by the other side. The U.S. Fish & Wildlife Service fails to rely upon the best science, critics claim.<sup>2</sup> If it did, they charge, it would adopt policies more to their liking.

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<sup>1</sup> See, e.g., Michael J. Bean, *The Endangered Species Act: Science, Policy, and Politics*, 1162 ANNALS THE N.Y. ACAD. OF SCI. 369 (2009) (noting the ESA “is one of the most contentious of our federal environmental laws.”).

<sup>2</sup> See Dennis D. Murphy & Pail S. Weiland, *Guidance on the Use of Best Available Science under the U.S. Endangered Species Act*, 58 ENVTL. MGMT. 1, 1 (2016) (“it is commonly alleged that the federal wildlife agencies charged with administration of the ESA fail to meet” the “best available science” standard). See also M. Lynne

The debate over the use of science under the ESA is part of the “science charade” that clouds substantive policy debate about species conservation.<sup>3</sup> What typically divides competing interest groups is not a devotion to science, but sharply divergent policy preferences dressed up in scientific garb. The political debate over the use of science under the ESA tends to obscure the dividing line between science and policy and undermines the development of more effective and equitable conservation strategies. Further, efforts to reform the ESA by mandating additional scientific procedures or increasing judicial scrutiny of the use of science by federal agencies will do little to address the ESA’s underlying problems or make species conservation efforts more effective.

Scientific research is necessary to inform species conservation decisions. But species conservation is not – and cannot be – a wholly scientific exercise. Judgments about what constitutes a distinct species or how to evaluate incomplete scientific data necessarily draw upon normative premises. More significantly, policy decisions about what sorts of conservation measures should be adopted are not scientific at all. Whether habitat loss will reduce the likelihood that a given species or population will survive in the wild may be a scientific question, but what measures should be adopted to conserve such habitat, and at what cost, is a normative policy judgment. Science can – indeed, must – inform such inquiries, but science cannot tell us what to do. Engaging in the “science charade,” either by pretending that ESA implementation may be guided by scientific judgment alone or by claiming that reforms of how science is used is

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Corn, Kristina Alexander, & Eugene H. Buck, Cong. Res. Serv., *The Endangered Species Act and “Sound Science,”* Congressional Research Service (Jan. 23, 2013), <https://fas.org/sgp/crs/misc/RL32992.pdf>.

<sup>3</sup> On the “science charade,” see Wendy Wagner, *the Science Charade in Toxic Risk Regulation*, 95 COLUM. L. REV. 1613 (1995).

unlikely to improve species conservation. To the contrary, efforts to constrain or control the use of science in ESA listing decisions or enhance judicial review of agency scientific determinations will undermine the quality and reliability of ESA science and lead to less effective conservation policy.

Whatever ails the ESA, a failure to incorporate adequate science is not the cause of the disease. As this Article explains, efforts to augment the amount or type of science used in ESA decision-making, whether through additional procedural mandates or altered standards of judicial review, will not address the conflicts that afflict species conservation policy. In some cases, such measures could further undermine the ESA’s ability to conserve species.

Part I of the Article gives a brief overview of the ESA, its operation, and the scientific requirements written into the Act. Part II describes the “science charade,” through which policymakers and others pretend that policy judgments are purely scientific questions, and the legal and political incentives that ensure this artifice persists. Part III details how the ESA’s structure generates political pressure on the use of science and encourages the science charade in species conservation. Part IV explains why various “sound science” reforms will not address these problems, and Part V outlines alternative policy reforms.

## I. THE ENDANGERED SPECIES ACT

Congress enacted the ESA in 1973 to conserve and protect animal and plant species threatened with extinction and the ecosystems upon which they depend.<sup>4</sup> Building upon prior statutes enacted in the 1960s,<sup>5</sup> the ESA creates a mechanism to identify those species in need of protection and imposes regulatory constraints on activities that may pose a threat to identified species and the habitat on which they depend. The statute is a “blunt”<sup>6</sup> yet powerful environmental law.<sup>7</sup>

The Act imposes significant regulatory constraints on economic activities that may harm endangered species.<sup>8</sup> Under Section 7, federal agencies are required to consult with the Fish and

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<sup>4</sup> See 16 U.S.C. § 1531(b) (“The purposes of this chapter are to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species . . .”).

<sup>5</sup> See Holly Doremus, *Listing Decisions under the Endangered Species Act: Why Better Science Isn’t Always Better Policy*, 75 WASH. U. L.Q. 1029, 1049 (1997) (summarizing ways in which the ESA built upon, and departed from, prior species conservation statutes).

<sup>6</sup> See Katrina Miriam Wyman, *Rethinking the ESA to Reflect Human Dominion Over Nature*, 17 N.Y.U. ENVTL. L.J. 490, 493 (2008) (“The ESA was set up to protect imperiled biodiversity in a straightforward, but blunt, way whose consequences were not appreciated in the 1970s”).

<sup>7</sup> It has become almost cliché to note that the ESA has been characterized as the “pitbull” of environmental law. As Donald Barry, then of the World Wildlife Fund explained: “It’s short, compact and has a hell of a set of teeth. Because of its teeth, the act can force people to make the kind of tough political decisions they wouldn’t normally make.” See Timothy Egan, *Strongest U.S. Environment Law May Become Endangered Species*, N.Y. TIMES, May 26, 1992. Cf. Wyman, *Rethinking*, *supra* note \_\_, at 506 (“the ESA may in reality be a paper tiger given the extent to which it is not enforced in many cases”).

<sup>8</sup> Although most of the activities regulated by the ESA are economic in nature, courts have held that the ESA may reach non-economic activities as well. See, e.g., *People for the Ethical Treatment of Property Owners v. Fish & Wildlife Serv.*, 852 F.3d 990 (10th Cir. 2017) (rejecting Commerce Clause challenge to regulation under the ESA); *accord Markle Interests, L.L.C. v. U.S. Fish & Wildlife Serv.*, 827 F.3d 452 (5th Cir. 2016); *San Luis & Delta–Mendota Water Auth. v. Salazar*, 638 F.3d 1163 (9th Cir. 2011); *Ala.–Tombigbee Rivers Coal.*, 477 F.3d 1250 (11th Cir. 2007); *GDF Realty Invs., Ltd. v. Norton*, 326 F.3d 622 (5th Cir. 2003); *Rancho Viejo v. Norton*, 323 F.3d 1062 (D.C. Cir. 2003); *Gibbs v. Babbitt*, 214 F.3d 483 (4th Cir. 2000); *Nat’l Ass’n of Home Builders v. Babbitt*, 130 F.3d 1041, 1046 (D.C. Cir. 1997). For an argument that the regulation of non-economic activity that threatens species may exceed the scope of the federal government’s Commerce Clause power, see Jonathan H. Adler, *Judicial Federalism and the Future of Federal Environmental Regulation*, 90 IOWA L. REV. 377, 406-17 (2005). See also Bradford C. Mank, *After Gonzales v. Raich: Is the Endangered Species Act Constitutional under the Commerce Clause?*, 78 U. COLO. L. REV. 375 (2007).

Wildlife Service or National Marine Fisheries Service to ensure that no action “authorized, funded, or carried out” by that agency will “jeopardize the continued existence of any endangered species or threatened species” or destroy or degrade critical habitat for such species.<sup>9</sup> Section 9 prohibits the unpermitted “taking” of any endangered species, by anyone.<sup>10</sup> Violators are subject to civil and criminal penalties.<sup>11</sup> As defined in the Act, “taking” an endangered species not only includes killing, wounding, or capturing an endangered species, but also otherwise harming the species, including by destroying or adversely modifying its habitat.<sup>12</sup> Section 10 provides for the granting of “incidental take permits” to authorize activities that would be otherwise prohibited under Section 9.<sup>13</sup>

The trigger for the Act’s regulatory provisions is the listing of a species.<sup>14</sup> Under Section 4, the Secretary of the Interior to identify and list those species that are “endangered” or

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<sup>9</sup> 16 U.S.C. §1536.

<sup>10</sup> 16 U.S.C. §1538.

<sup>11</sup> See 16 U.S.C. § 1540.

<sup>12</sup> See *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon*, 515 U.S. 687 (1995).

<sup>13</sup> See 16 U.S.C. § 1539.

<sup>14</sup> See Katrina Miriam Wyman, *Politics and Science in Endangered Species Act Listing Decisions*, in INSTITUTIONS AND INCENTIVES IN REGULATORY SCIENCE 101 (Jason Scott Johnston ed. 2012) (“Under the existing ESA, the decision to list a species has high stakes because listing is the gateway to the potentially significant federal protections that the Act provides.”).

“threatened.”<sup>15</sup> Once a species is listed, the Act directs the Secretary to designate “critical habitat” for the species<sup>16</sup> and to develop a “recovery plan” to ensure the species’ survival.<sup>17</sup>

The ESA defines “endangered species” as “any species which is in danger of extinction throughout all or a significant portion of its range.”<sup>18</sup> A “threatened species,” by contrast, is defined as “any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.”<sup>19</sup> A “species” need not be an actual species, however. Rather, the ESA defines “species” is defined to include “any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature.”<sup>20</sup>

As of May 2017, there were 2,320 species on the endangered and threatened species lists.<sup>21</sup> Of listed species, 1,653 are domestic and 675 are foreign.<sup>22</sup> 1,862 species are listed as

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<sup>15</sup> See 16 U.S.C. § 1533(a). Responsibility for determining the status of some marine species is assigned to the Secretary of Commerce. The Interior Secretary and the Commerce Secretary have delegated their responsibilities under these provisions to the U.S. Fish & Wildlife Service (FWS) and National Marine Fisheries Service (NMFS aka NOAA Fisheries), respectively. *Id.* As a practical matter, FWS is responsible for implementing the ESA in most circumstances, as NMFS is responsible for only a small fraction of listed species.

<sup>16</sup> See 16 U.S.C. § 1533(a)(3)(A).

<sup>17</sup> See 16 U.S.C. § 1533(f).

<sup>18</sup> See 16 U.S.C. § 1532(6).

<sup>19</sup> See 16 U.S.C. § 1532(20).

<sup>20</sup> See 16 U.S.C. § 1532(16). In addition, the Act exempts from those species eligible for to be listed “species of the Class Insecta determined by the Secretary to constitute a pest whose protection under the provisions of this chapter would present an overwhelming and overriding risk to man.” See 16 U.S.C. § 1532(6).

<sup>21</sup> See U.S. Fish and Wildlife Service, Listed Species Summary (Box Score) <https://ecos.fws.gov/ecp0/reports/box-score-report> (site visited May 22, 2017).

<sup>22</sup> *Id.*

endangered. 466 species are listed as threatened.<sup>23</sup> Although the FWS is authorized to list species on its own initiative, most species listings are the result of petitions filed by researchers or environmentalist groups, and many are the result of litigation.<sup>24</sup>

Under Section 4, listing determinations are to be made “solely on the basis of the best scientific and commercial data available”<sup>25</sup> This formulation is not unique to the ESA,<sup>26</sup> and is based upon language from earlier federal species conservation statutes.<sup>27</sup> Because the standard focuses on what information and analysis is “available” it does not require that the data relied upon by the agency surpass any particularly quantitative or qualitative threshold.<sup>28</sup> The Act does,

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<sup>23</sup> *Id.*

<sup>24</sup> See Wyman, *Rethinking*, *supra* note \_\_, at 496-97. Insofar as litigation is used to drive listing decisions, it threatens to divert resources away from conservation efforts the FWS would have otherwise prioritized. As Professor Wyman explains, “the FWS has lost control over the listing process as decisions about whether to list species are largely made in response to citizen petitions for listing and litigation.” *Id.* at 496. This is a significant problem for species conservation efforts.

<sup>25</sup> See 16 U.S.C. §1533(b)(1).

The Secretary shall make determinations required by subsection (a)(1) solely on the basis of the best scientific and commercial data available to him after conducting a review of the status of the species and after taking into account those efforts, if any, being made by any State or foreign nation, or any political subdivision of a State or foreign nation, to protect such species, whether by predator control, protection of habitat and food supply, or other conservation practices, within any area under its jurisdiction; or on the high seas.

<sup>26</sup> See Doremus, *Listing*, *supra* note \_\_, at 1041-47 (surveying use of similar formulation in various conservation statutes).

<sup>27</sup> As originally enacted, 16 U.S.C. §1533 required listing decisions to be made “on the basis of the best scientific and commercial data available.” Pub. L. No. 93-205, §4(b)(1), 87 Stat. 884 (1973). The word “solely” was added in 1982. See Pub. L. No. 97-304, §2(a)(2), 96 Stat. 411 (1982). This revision was made to prevent the government relying upon “non-biological” considerations, such as economic impact analyses. See Doremus, *Listing*, *supra* note \_\_, at 1055.

<sup>28</sup> In the case of petitions to list (or delist) a species, however, the Secretary is only required to review a species’ status and make a listing (or delisting) determination if the Secretary determines the petition “presents substantial scientific or commercial information” in support of the petitioned action. See 16 U.S.C. §1333(b)(3)(a).

however, identify a series of factors to consider in assessing risks to species.<sup>29</sup> Once a species is listed, critical habitat designations must also be based upon the “best scientific data available,” though the Secretary is also required to consider potential economic and other impacts of such designations.<sup>30</sup>

The ESA’s “best available” science requirement “rests on the assumption that conservation policy decisions can be made objectively on the basis of existing or reasonably attainable scientific knowledge.”<sup>31</sup> While listing decisions must be made on the “best available science,” the Act does not specify the extent to which predicate determinations, such as what constitutes a species, must also be made exclusively on a scientific basis.<sup>32</sup> The terms “endangered” and “threatened,” although defined in the act, also lack and scientifically defined parameters.<sup>33</sup>

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<sup>29</sup> Under 16 U.S.C. §1533(a)(1), in analyzing whether a species is endangered or threatened, the Secretary must determine whether the risk to the species is “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; or
- (E) other natural or manmade factors affecting its continued existence.”

<sup>30</sup> See 16 U.S.C. §1533(b)(2) (providing that critical habitat designations are to be made “on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security, and any other relevant impact, of specifying any particular area as critical habitat.”).

<sup>31</sup> See Doremus, *Listing*, *supra* note \_\_, at 1056.

<sup>32</sup> See Doremus, *Listing*, *supra* note \_\_, at 1095.

<sup>33</sup> See *infra*

As of May 2017, the FWS had delisted 78 species, subspecies, and species populations under the ESA.<sup>34</sup> Of these, ten were delisted due to extinction, and nineteen were delisted due to a taxonomic or data error.<sup>35</sup> Of the remaining 47 –those the FWS identifies as “recovered” -- some of these represent not distinct species, but distinct populations of a given species. For instance, the FWS delisting report separately lists nine populations of humpback whale (*Megaptera novaeangliae*), accounting for nearly one-fifth of species “recovered” by the Act.<sup>36</sup>

The fact that species are occasionally delisted because of data errors or a need to revise taxonomic determinations highlights the fact that species are necessarily listed based upon incomplete knowledge.<sup>37</sup> When the Tennessee snail darter was discovered in Tennessee’s Tellico River, researchers understandably assumed that the small fresh-water fish was quite rare. After all, it had not been discovered before. The snail darter was subsequently listed and prompted the litigation that led to the Supreme Court’s decision in *Tennessee Valley Authority v. Hill*.<sup>38</sup> Years later, after the litigation had concluded (and Congress exempted the TVA’s Tellico Dam from the Act’s requirements), additional populations of the snail darter were discovered and it was “downlisted” from “endangered” to “threatened.”<sup>39</sup>

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<sup>34</sup> See U.S. Fish & Wildlife Service, “Delisted Species,” <https://ecos.fws.gov/ecp0/reports/delisting-report> (visited May 15, 2017). This site is regularly updated as delisting decisions are made.

<sup>35</sup> A taxonomic or data error means that some of the assumptions made when a species was first listed turned out to be inaccurate.

<sup>36</sup> See USFWS, “Delisted Species,” *supra* note \_\_.

<sup>37</sup> See Murphy & Weiland, *supra* note \_\_, at 5.

<sup>38</sup> 437 U.S. 153 (1978).

<sup>39</sup> See Final Rule Reclassifying the Snail Darter (*Percina tanasi*) From an Endangered Species to a Threatened Species, 49 Fed. Reg. 27,510 (1984); see also CHARLES C. MANN & MARK L. PLUMMER, NOAH’S CHOICE 173 (1995).

The relatively small number of delisted species – and the even smaller number of those species the FWS deems “recovered” – is the basis for substantial criticism of the Act.<sup>40</sup> The ESA’s stated goal of recovering species from the brink of extinction “has been reached in distressingly few cases.”<sup>41</sup> To some (including this author), the ESA can hardly be deemed a success if only two percent of listed species have been recovered in the past forty-some years.<sup>42</sup> Others argue that the focus on recoveries is misplaced, however, as the real measure of the ESA’s success is the even smaller number of extinctions.<sup>43</sup> In this view, the ESA may not be nursing endangered populations back to health, but it is preventing them from going extinct.<sup>44</sup>

A 2007 study found that listing a species does not appear to lead to an improvement in that species’ status.<sup>45</sup> To the contrary, this study found that listing a species can actually be detrimental if the listing is not followed with significant funding on species recovery.<sup>46</sup> As the

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<sup>40</sup> See Wyman, *Rethinking*, *supra* note \_\_ at 494-95. For this author’s critique, see Jonathan H. Adler, *The Leaky Ark: The Failure of Endangered Species Regulation on Private Land*, in REBUILDING THE ARK: NEW PERSPECTIVES ON ENDANGERED SPECIES ACT REFORM (Jonathan H. Adler ed., 2011).

<sup>41</sup> Joe Kerkvliet & Christian Langpap, *Learning from Endangered and Threatened Species Recovery Programs: A Case Study Using U.S. Endangered Species Act Recovery Scores*, 63 *ECOL. ECON.* 499, 500 (2007).

<sup>42</sup> The record may be even worse in that it is not clear how much credit the ESA deserves for some of these recoveries. See Adler, *Leaky*, *supra* note \_\_, at 10.

<sup>43</sup> See, e.g., Krishna Gifford, *Measuring Recovery Success*, *ENDANGERED SPECIES BULLETIN* (Sept. 2007) at 4 (“counting only the number of recovery related delistings does not give a true measure of the Act’s success”).

<sup>44</sup> See, e.g., J. Michael Scott, et al., *By the Numbers*, in *THE ENDANGERED SPECIES ACT AT THIRTY, VOLUME 1: RENEWING THE CONSERVATION PROMISE* 31 (Dale D. Goble, J. Michael Scott, & Frank W. Davis eds., 2006) (estimating that the ESA saved over 200 species from extinction in thirty years); see also Martin F. J. Taylor, Kieran F. Suckling, & Jeffrey J. Rachlinski, *The Effectiveness of the Endangered Species Act: A Quantitative Analysis*, 55 *BIOSCIENCE* 365 (2005) (finding that the longer a species is listed, the more likely it is to have an improving status).

<sup>45</sup> See Paul J. Ferraro, Craig McIntosh, and Monica Opsina, *The Effectiveness of the U.S. Endangered Species Act: An Econometric Analysis Using Matching Methods*, 54 *J. ENVTL. ECON. & MGMT.* 245 (2007).

<sup>46</sup> *Id.* at 246:

Our results indicate that success can be achieved when the ESA is combined with substantial species-specific spending, but listing in the absence of funding appears to have adverse consequences for species

authors explained: “Our analysis suggests that it is not the act of listing itself that matters, but rather high levels of expenditures for recovery combined with listing. Simply listing a species in the absence of such expenditures appears to lead to a decline.”<sup>47</sup> Other studies seem to support the conclusion that spending on species conservation is more important than listing.<sup>48</sup> One problem with all such analyses, however, is that they tend to be based upon FWS assessments of species status, and such assessments are anything but scientific. As one set of researchers concluded, FWS assessments are somewhat subjective, lack transparent criteria, and “may be manipulated to achieve agency objectives.”<sup>49</sup>

## II. THE SCIENCE CHARADE

The debate over the use of science under the ESA provides a textbook example of what Professor Wendy Wagner characterized as the “science charade.”<sup>50</sup> In an influential 1995 article, Wagner diagnosed “a pervasive ‘science charade,’ where agencies exaggerate the contributions made by science in setting toxic standards in order to avoid accountability for the underlying

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recovery. This implies that using scarce conservation funding in the contentious process of listing a species may be less effective than using this funding to promote recovery directly.

<sup>47</sup> *Id.*

<sup>48</sup> See, e.g., Kerkvleit & Langpap, *supra* note \_\_. See also Adler, *Leaky*, *supra* note \_\_, at 12-14.

<sup>49</sup> See Ferraro, McIntosh & Ospina, *supra* note \_\_, at 247.

<sup>50</sup> See Wendy Wagner, *the Science Charade in Toxic Risk Regulation*, 95 COLUM. L. REV. 1613 (1995).

policy decisions.”<sup>51</sup> As Wagner detailed, “camouflaging controversial policy decisions as science” enables government agencies to evade political and legal accountability.<sup>52</sup>

Many science-related policy questions – such as the precise level at which exposure to a chemical may pose a health risk, let alone the exposure level that should be proscribed under law – cannot be answered solely by reference to scientific research. Contemporary research rarely, if ever, is sufficiently comprehensive to answer relevant scientific questions with complete certainty. Yet because such questions necessarily implicate and rely upon scientific analysis, such questions are perceived as “scientific” by observers, particularly the lay public. This occurs, in part, because science “appears to be shielded from the evils of politics” and thus offers a seemingly “objective” basis for policy decisions.<sup>53</sup> Scientists themselves sometimes act in ways to further this misimpression.<sup>54</sup> As Professor Holly Doremus notes, “characterizing a decision as strictly scientific can allow politicians to evade difficult value choices, placing those choices instead in the hands of technical experts.”<sup>55</sup>

Emphasizing, or indeed exaggerating, the role science plays in any given agency decision can also help insulate agency actions from judicial review.<sup>56</sup> Courts have long been wary of

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<sup>51</sup> Wagner, *supra* note \_\_\_, at 1617.

<sup>52</sup> Wagner, *supra* note \_\_\_, at 1617.

<sup>53</sup> See Doremus, *Listing*, *supra* note \_\_\_, at 1038.

<sup>54</sup> On the potential roles of scientists in the policy process, see ROGER PIELKE, JR., *THE HONEST BROKER: MAKING SENSE OF SCIENCE IN POLICY AND POLITICS* (2003). On policy advocacy by scientists, see Robert t. Lackey, *Normative Science*, 82 *TERRA* 36 (2013). On the prevalence of advocacy in scientific research related to species conservation, see J. Michael Scott, et al., *Policy Advocacy in Science: Prevalence, Perspectives and Implications for Conservation Biologists*, 21 *CONSERVATION BIOLOGY* 29 (2007).

<sup>55</sup> See Doremus, *Listing*, *supra* note \_\_\_, at 1038.

<sup>56</sup> See Wagner, *supra* note \_\_\_, at 1661-67.

substituting their views for those of expert agencies delegated authority to assess scientific or technical matters. Consequently, the deference agencies receive for scientific determinations often exceeds the generous degree of deference provided in administrative law.

Under *Baltimore Gas & Electric Co. v. Natural Resources Defense Council*<sup>57</sup> agencies receive what is often termed “super deference.”<sup>58</sup> As Justice Sandra Day O’Connor explained for a unanimous Court, when considering a challenge to an agency’s scientific judgment “within its area of special expertise, at the frontiers of science . . . a reviewing court must generally be at its most deferential.”<sup>59</sup> Such deference is to be even greater than that provided an agency’s “simple findings of fact,”<sup>60</sup> and such deference is not to be diminished by the existence of scientific uncertainty.<sup>61</sup>

Although Wagner’s focus was toxic risk regulation, such as that administered by the Environmental Protection Agency, her basic critique is quite applicable to species conservation efforts under the ESA administered by the FWS. As with toxic risk regulation, current scientific research cannot answer every relevant question with absolute certainty. Assumptions and premises adopted for normative or other reasons must help fill the gaps, resolve uncertainties, and produce recommendations for action. Nonetheless, relevant questions and determinations, including those driven by policy concerns, are often presented or perceived as purely objective

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<sup>57</sup> 462 U.S. 87 (1983).

<sup>58</sup> See Emily Hammond Meazell, *Super Deference, the Science Obsession and Judicial Review as Translation of Agency Science*, 109 MICH. L. REV. 733 (2011).

<sup>59</sup> *Baltimore Gas*, 462 U.S. at 103.

<sup>60</sup> *Id.*

<sup>61</sup> *Id.* at 97.

scientific matters.<sup>62</sup> In the process, accountability and transparency for normative policy judgments is obscured. By appealing to scientific authority policymakers are able to escape responsibility for their policy decisions.<sup>63</sup> By presenting policy choices as “scientific,” potentially controversial policy choices are perceived as more legitimate by the lay public.<sup>64</sup>

The imposition of regulatory constraints on economically productive activity necessarily creates winners and losers. Environmental advocates may cheer regulations that restrict the use of toxic chemicals or prevent the development of species habitat, while regulated industries may decry such measures and the costs they impose.<sup>65</sup> Choosing a side necessarily risks alienating one side of the issue. Embracing the “science charade” offers a way out of this dilemma for policymakers, as they may insist that a given policy measure is dictated by science, instead of their own policy preferences.<sup>66</sup>

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<sup>62</sup> See Meazell, *supra* note \_\_, at 736 (“interested parties and agencies alike are incentivized to cloak their policy choices in the seemingly unassailable mantle of science.”).

<sup>63</sup> See Michael S. Carolan, *The Politics in Environmental Science: The Endangered Species Act and the Preble’s Mouse Controversy*, 17 ENVTL. POLITICS 449. 449 (2008).

<sup>64</sup> See Doremus, *Listing*, *supra* note \_\_, at 1038 (“Decisions attributed to science gain instant legitimacy through science’s image as a pursuit above the concerns of the partisan political world.”); Cary Coglianese & Gary E. Marchant, *Shifting Sands: The Limits of Science in Setting Risk Standards*, 152 U. PA. L. REV. 1255, 1264 (2004) (“Science has considerable rhetorical appeal when it comes to defending regulatory decisions, as it is often described and perceived as being ‘objective.’”).

<sup>65</sup> In reality, conflicts over regulation are usually more complicated than environmentalists on one side and industry on the other. In many instances, some industry groups benefit from the imposition of regulations because such measures may suppress competition or create a comparative advantage. See generally Jonathan H. Adler, *Clean Politics, Dirty Profits: Rent-Seeking Behind the Green Curtain*, in POLITICAL ENVIRONMENTALISM (Terry Anderson ed., 2000); Todd J. Zywicki, *Environmental Externalities and Political Externalities: The Political Economy of Environmental Regulation and Reform*, 73 TULANE L. REV. 845 (1999); ENVIRONMENTAL POLITICS: PUBLIC COSTS, PRIVATE REWARDS (Michael S. Greve & Fred L. Smith Jr. eds., 1992).

<sup>66</sup> Wagner, *supra* note \_\_, at 1651 (“no rational agency or administrative official acting in her own self-interest would expose the underlying policy choices when faced with the numerous benefits of engaging in the science charade and the high price for proceeding any other way.”).

The complex nature of many environmental policy decisions may make it more difficult for a rationally ignorant lay public to understand the role that science does—or does not—play in particular decisions.<sup>67</sup> This problem is compounded by the tendency of scientists themselves to obscure the limits of scientific determinations.<sup>68</sup> As Wagner noted, “scientists have been shown to deliberately misidentify the hazy line between science and policy.”<sup>69</sup> This occurs both when scientists and policy experts fail to identify or disclose the limits of existing scientific research, as well as when scientific researchers fail to disclose the choices they have made to address underlying uncertainties or the limits of existing research.<sup>70</sup>

In some cases, the charade may be deliberate, as when a scientific expert is playing the role of policy advocate, seeking to advance her own policy preferences.<sup>71</sup> In other cases, it may be the charade results from the incentives created the underlying legal and policy framework. Insofar as some statutes mandate that specific regulatory or other actions follow from predicate scientific determinations – such as a requirement that the FWS must take specified actions once a species is classified as “endangered” -- the “science charade” may be inevitable

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<sup>67</sup> On rational ignorance in the electorate, see ILYA SOMIN, *DEMOCRACY AND POLITICAL IGNORANCE: WHY SMALLER GOVERNMENT IS SMARTER* (2013).

<sup>68</sup> See Wyman, *Politics*, *supra* note \_\_, at 111 (“When regulators and scientists debate policy issues in scientific language that is not easily accessible, they make it harder for the lay public to participate meaningfully in debates and hold decision-makers accountable for choices that ultimate turn on values, not complex science.”).

<sup>69</sup> See Wagner, *supra* note \_\_, at 1628. See also Edward J. Rykiel, *Scientific Objectivity, Value Systems, and Policymaking*, 51 *BIOSCIENCE* 433, 434 (2001) (“Scientists typically portray the information they provide to the public as objective and value free, with the implication that those traits confer greater weight to their opinions than should be accorded to the value laden opinions of nonscientists.”).

<sup>70</sup> See Wagner, *supra* note \_\_, at 1629 (“Agency scientists and bureaucrats engage in a ‘science charade’ by failing first to identify the major interstices left by science . . . and second to reveal the policy choices they made to fill each trans-scientific gap.”).

<sup>71</sup> On scientists as policy advocates, see generally PIELKE, *supra* note \_\_.

## III. ENDANGERED SCIENCE

In 1998, the U.S. Fish & Wildlife Service (FWS) listed the Preble’s meadow jumping mouse as a “threatened species” under the Endangered Species Act.<sup>72</sup> This listing, and the subsequent designation of over 31,000 acres as critical habitat for the species, imposed substantial economic costs on local communities.<sup>73</sup> In 2003, a scientific report challenged the FWS determination that the mouse was a distinct subspecies.<sup>74</sup> Although some questions were raised about this research, the FWS opted to consider delisting the species, to the relief of some local government officials and landowners, but to the consternation of environmentalist groups.<sup>75</sup> Some of the former sought to have the mouse delisted, alleging that the mouse was neither

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<sup>72</sup> See Final Rule to List the Preble's Meadow Jumping Mouse as a Threatened Species, 63 Fed. Reg. 26,517, 26,526 (May 13, 1998) (codified at 50 C.F.R. pt. 17).

<sup>73</sup> See David Holthouse, *Building a Better Mousetrap*, WESTWORLD, Jan. 20, 2005 (“The federal Fish & Wildlife Service estimates that protecting Preble’s habitat has cost real-estate developers in Colorado and Wyoming between \$8 million and \$18 million every year in consulting fees alone.”); see also Michael S. Carolan, *The Politics in Environmental Science: The Endangered Species Act and the Preble’s Mouse Controversy*, 17 ENVTL. POLITICS 449, 451 (2008) (detailing the conflict); Berry J. Brosi & Eric G. Biber, *Statistical Inference, Type II Error and Decision Making under the US Endangered Species Act*, 7 FRONTIERS IN ECOL. & ENV. 487, 488 (2009) (noting the listing decision received attention “because protection of this animal has impacted development in a rapidly growing region”).

<sup>74</sup> See R.J. Ramey, et al., *Genetic Relatedness of the Preble’s Meadow Jumping Mouse (*Zapus hudsonius preblei*) to Nearby Species of *Z. Hudsonius* as Inferred from Variation in Cranial Morphology, Mitochondrial DNA, and Microsatellite DNA: Implications for Taxonomy and Conservation*, 8 ANIMAL CONSERVATION 329 (2005).

<sup>75</sup> See 12–Month Finding on a Petition to Delist the Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*) and Proposed Delisting of the Preble's Meadow Jumping Mouse, 70 Fed. Reg. 5,404 (Feb. 2, 2005)

threatened, nor a distinct subspecies.<sup>76</sup> Debate over the mouse’s taxonomic status and need for protection intensified, prompting the FWS to commission additional research.<sup>77</sup>

The legal and scientific fight over the mouse were just beginning. In 2007, the Solicitor of the United States Department of the Interior issued a legal opinion reinterpreting the meaning of the phrase “in danger of extinction throughout all or a significant portion of its range” as used in the ESA. Under this new interpretation, “range” was to be limited to those areas in which a species is still extant, not a species historic range. Upon the basis of this interpretation, the FWS in 2008 then delisted the mouse as threatened in Wyoming, but not Colorado.<sup>78</sup> Environmentalist groups successfully challenged both the Interior Solicitor’s opinion<sup>79</sup> and the FWS decision,<sup>80</sup> and the mouse’s listing was restored – at least for the time being.<sup>81</sup> Additional research published in 2013 again cast doubt on whether the Preble’s meadow jumping mouse should be considered a

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<sup>76</sup> 90–Day Finding for Petition to Delist the Preble's Meadow Jumping Mouse in Colorado and Wyoming and Initiation of a 5–Year Review, 69 Fed.Reg. 16,944, 16,945 (Mar. 31, 2004).

<sup>77</sup> See Katrina Miriam Wyman, *Politics and Science in Endangered Species Act Listing Decisions*, in INSTITUTIONS AND INCENTIVES IN REGULATORY SCIENCE 109 (Jason Scott Johnson ed. 2012).

<sup>78</sup> See Final Rule to Amend the Listing for the Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*) to Specify over What Portion of Its Range the Subspecies Is Threatened, 73 Fed. Reg. 39790 (July 10, 2008); Center for Native Ecosystems v. Salazar, 711 F.Supp.2d 1267 (D. Colo. 2010).

<sup>79</sup> See *Defenders of Wildlife v. Salazar*, 729 F.Supp.2d 1207 (D.Mont.2010); *WildEarth Guardians v. Salazar*, 2010 WL 3895682 (D.Ariz. Sept. 30, 2010).

<sup>80</sup> See *Center for Native Ecosystems v. Salazar*, 795 F.Supp.2d 1236 (D. Colo. 2011).

<sup>81</sup> In 2013, the FWS also reviewed the prior delisting petitions and concluded that the mouse should retain its listing. See 12-Month Finding on Two Petitions to Delist the Preble's Meadow Jumping Mouse, 78 Fed. Reg. 31680 (May 24, 2013).

distinct subspecies.<sup>82</sup> Based upon this research, in 2017 the Pacific Legal Foundation filed a new desilting petition on behalf of “sound science and property rights advocates.”<sup>83</sup>

ESA critics charged that the FWS decision to list the Preble’s meadow jumping mouse in the first place was an example of “junk science.”<sup>84</sup> “The Preble’s meadow jumping mouse is a perfect example of how getting the science wrong has lasting, real-life implications for landowners and ultimately the species itself,” commented one opponent of the listing.<sup>85</sup> Supporters of ESA protection of the mouse lodged similar criticisms at those who attacked the listing, declaring that “good science” justified listing the mouse under the Act.<sup>86</sup> Both opponents and supporters of the listing claimed that “science” was on their side. Yet the heart of the dispute over the Preble’s meadow jumping mouse was not a question of science. Scientists disputed whether the mouse should be considered a distinct subspecies, to be sure, but the political and legal fight over the mouse was about policy. Neither supporters nor opponents of listing the Preble’s meadow jumping mouse had principled commitments to a particular approach to classifying subspecies. Rather, the rhetoric of science was used to mask substantive

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<sup>82</sup> See Jason L. Malaney & Joseph A. Cook, *Using Biogeographical History to Inform Conservation: The Case of Preble’s Meadow Jumping Mouse*, 22 MOLECULAR ECOLOGY 6000 (2013).

<sup>83</sup> See Damien M. Schiff, *The Preble’s Meadow Jumping Mouse Should Be Delisted*, PLF Liberty Blog, Mar. 30, 2017, <http://blog.pacificlegal.org/prebles-meadow-jumping-mouse-delisted/>.

<sup>84</sup> See Carolan, *supra* note \_\_, at 452 (quoting Rep. Barbara Cubin (R-WY) on how “This entire episode highlights the problems of junk science with the Endangered Species Act); see also Vincent Carroll, *Vindication on Preble’s Meadow Jumping Mouse*, DENVER POST (Oct. 24, 2013).

<sup>85</sup> See PLF and Property Rights Groups Petition Feds for Preble’s Mouse Delisting, Mar. 30, 2017, <https://www.pacificlegal.org/release-3-30-17-prebles-mouse-1-1506> (comments of Terry Fankhauser, Executive Vice President, Colorado Cattlemen’s Association).

<sup>86</sup> See Sylvia Fallon, *Groundhog’s Day for the Preble’s Meadow Jumping Mouse?* (Dec. 11, 2013), <https://www.nrdc.org/experts/sylvia-fallon/groundhogs-day-prebles-meadow-jumping-mouse>; see also Holthouse, *supra* note \_\_ (quoting environmental activists accusing a scientist skeptical of the mouse’s listing of “politicizing what is supposed to be an objective scientific process”).

disagreements over species conservation policy and, in this particular case, whether existing and potential threats to the existence of the Preble’s meadow jumping mouse in particular parts of the country justified the imposition of potentially costly regulatory measures.

The fight over the Preble’s meadow jumping mouse encapsulates how the rhetoric of science is used as a weapon in fights over species conservation policy. It illustrates how the “science charade” Professor Wagner described in the context of toxic risk regulation also occurs in species conservation under the ESA. Indeed, in some respects the charade is written into the law itself.<sup>87</sup>

The conclusion that a species is “endangered” in all or a part of its range triggers regulatory constraints on economic activity. This means the most effective means to influence ESA regulation is to influence the decision whether or not to list a species as endangered. Although it is possible to obtain case-by-case regulatory exemptions, as with incidental take permits, even this process may be costly. For most of those affected by the ESA’s regulatory burdens, there is relatively little ability to influence agency action once listing decisions have been made. Similarly, if an environmentalist group wishes to use the ESA to chill development, the purportedly scientific listing decision is the best place for it to focus its efforts.

In this way the ESA funnels efforts to influence regulatory decision-making toward the listing process and creates massive incentives to influence how listing decisions are made. Efforts to advance normative or interest-driven policy preferences must be advanced through scientific debates over whether species merit listing. At the same time, the ESA’s “best available science” mandate itself masks policy-driven judgments about how species should be classified

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<sup>87</sup> See Wyman, *Politics*, *supra* note \_\_\_, at 100 (“the Act promotes a ‘science charade.’”).

and threats to species survival should be identified. The combination is a pervasive science charade throughout the ESA drama.

#### A. *Science under Pressure*

In theory, the addition of an imperiled species to the list of endangered and threatened species should be a relatively routine matter driven by scientific considerations. The reality is quite different. A proposal to list a species often signals the onset of fierce political and administrative battles in which true scientific concerns are subordinated to policy objectives, as occurred with the Preble’s meadow jumping mouse.<sup>88</sup> One reason for this is that the scientific determination that a given species is threatened or endangered triggers non-discretionary regulatory requirements. Under the ESA, the surest way to control a policy outcome is to control the science. Activists on all sides recognize this fact, which is why activists spend so much time trying to influence the scientific conclusions.<sup>89</sup>

Property owners who own potential habitat for a given species are likely to oppose listing of the species so as to prevent regulation of their land.<sup>90</sup> Environmental activists are likely to

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<sup>88</sup> Another prominent example of interest group efforts to influence scientific conclusions for the purpose of influencing regulatory outcomes is the fight over the listing of the Alabama sturgeon. *See, e.g.,* Ray Vaughan, *State of Extinction: The Case of the Alabama Sturgeon and Ways Opponents of the Endangered Species Act Thwart Protection for Rare Species*, 46 ALA. L. REV. 569 (1995) (discussing opposition to listing of Alabama sturgeon).

<sup>89</sup> At the same time, this structure “invit[es] scientists to become advocates for or against species protection . . . taking them away from their core expertise.” Wyman, *Politics*, *supra* note \_\_\_, at 100.

<sup>90</sup> *See* Barton H. Thompson, Jr., *The Endangered Species Act: A Case Study in Takings and Incentives*, 49 STAN. L. REV. 315, 350 (1997). Writing in *Conservation Biology*, a group of wildlife biologists observed that “the regulatory approach to conserving endangered species and diminishing habitats has created anti-conservation sentiment among many private landowners who view endangered species as economic liabilities.” *See* Martin B. Main, Fritz M. Roka, & Reed F. Noss, *Evaluating Costs of Conservation*, 13 CONSERVATION BIOLOGY 1263 (1999).

take the opposite view. As theory would predict, interest group efforts to influence species listings appears to increase along with the economic stakes involved.<sup>91</sup> At the extreme, this has produced incentives to manipulate the scientific evidence supporting species listing.<sup>92</sup> During the Bush Administration, environmentalist groups alleged that Interior Department officials manipulated the findings of scientific reports at the expense of regulatory protections for species.<sup>93</sup> Unsurprisingly, interest group activity appears to influence how quickly species move through the ESA listing process.<sup>94</sup>

It is not always necessary to alter scientific conclusions to affect a listing decision or reduce the costs listing may impose on regulated entities. Delay in the listing of a species, perhaps due to legal or administrative disputes over the meaning of relevant scientific research, can benefit those landowners and economic interests would have borne the costs of the ESA's regulatory limitations. At the same time, it can be harmful to conservation.<sup>95</sup> Delay in listing a species increases the opportunity for landowners to respond to the perverse incentives created by the Act by eliminating potential habitat before the species that rely upon it are listed.<sup>96</sup>

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<sup>91</sup> See Amy Whritenour Ando, *Economies of Scope in Endangered-Species Protection: Evidence from Interest Group Behavior*, 41 J. ENVTL ECON. & MGMT. 312 (2001); see also Amy Whritenour Ando, *Do Interest Groups Compete? An Application to Endangered Species*, 114 PUBLIC CHOICE 137 (2003) (finding interest group involvement in species listings increases with the expected costs and benefits of such listings).

<sup>92</sup> See, e.g., Corn, et al., *supra* note \_\_.

<sup>93</sup> *Id.* at 8-9.

<sup>94</sup> See Amy Whritenour Ando, *Waiting to Be Protected under the Endangered Species Act: The Political Economy of Regulatory Delay*, 42 J.L. & ECON. 29, 52 (1999).

<sup>95</sup> See Ando, *Waiting*, *supra* note \_\_, at 34 (“Long delay in the addition of a species to the endangered species list can reduce the likelihood that the species will escape extinction; species have even been thought to have become extinct while waiting for final action from the agency. Thus, delay diminishes the benefits of a listing. It also reduces the costs.”).

<sup>96</sup> Several studies have indicated that landowners engage in preemptive habitat destruction to avoid ESA regulation. See Dean Lueck & Jeffrey Michael, *Preemptive Habitat Destruction under the Endangered Species Act*, 46 J. L. &

Because listing a species can have such significant regulatory effects, groups opposing environmentally harmful development, such as environmentalist groups, have an incentive to identify potentially endangered species in areas where such development threatens to occur. Andy Stahl of the Sierra Club Legal Defense Fund acknowledged that “the ultimate goal” of environmentalist litigation to list the northern spotted owl was “to delay the harvest of old growth forests so as to give Congress a chance to provide specific statutory protection for those forests.”<sup>97</sup> According to Stahl, the owl was a “surrogate” that could ensure “protection for the forests” under the ESA.<sup>98</sup> The spotted owl litigation was not without its environmental costs, however. In order to respond to environmentalist lawsuits, the FWS was forced to divert resources from more pressing needs, compromising overall recovery efforts.<sup>99</sup> This does not appear to be an isolated instance, as the pattern of environmentalist litigation challenging FWS listing decisions does not appear to align with species conservation priorities.

The use of scientific findings as a trigger for regulation may also compromise the ability to obtain better scientific information about the threats posed to endangered species, particularly on private land. The threat of land-use regulation discourages private landowners from disclosing information and cooperating with scientific research on their land, further

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ECON 27 (2003); Daowei Zhang, *Endangered Species and Timber Harvesting: The Case of Red-Cockaded Woodpeckers*, 32 ECON. INQ. 150 (2004); Amara Brook et al., *Landowners’ Responses to an Endangered Species Act Listing and Implications for Encouraging Conservation*, 17 CONSERVATION BIOLOGY 1638 (2003). For a broader discussion of these studies and other research, see Jonathan H. Adler, *Money or Nothing: The Adverse Environmental Consequences of Uncompensated Land-Use Controls*, 49 BOST. COLL. L. REV. 301, 313-37 (2008).

<sup>97</sup> Quoted in Ike C. Sugg, *Caught in the Act: Evaluating the Endangered Species Act, Its Effects on Man and Prospects for Reform*, 24 CUMBERLAND L. REV. 1, 53, n335 (1993).

<sup>98</sup> *Id.*

<sup>99</sup> See Marco Restani and John M. Marzluff, *Funding Extinction? Biological Needs and Political Realities in the Allocation of Resources to Endangered Species Recovery*, 52 BIOSCIENCE 169, 175 (2002).

compromising species conservation efforts.<sup>100</sup> Some landowners fear that the discovery of endangered or threatened species populations will lead to the imposition of regulatory controls.<sup>101</sup> Perhaps as a consequence, most research on endangered species occurs on government land, despite the importance of private land for species preservation.<sup>102</sup> This can have broad consequences due to the importance of private land for species conservation.<sup>103</sup>

With so much at stake when a species is listed, it is no surprise that the scientific integrity of the listing process experiences enormous pressure. The ESA requires that decisions to list endangered and threatened species should be determined by the “best available” scientific evidence. Yet there is ample empirical evidence that political and other non-scientific factors influence listing decisions.<sup>104</sup> This should not surprise. Listing decisions can force the federal

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<sup>100</sup> See Stephen Polasky & Holly Doremus, *When the Truth Hurts: Endangered Species Policy on Private Land with Imperfect Information*, 35 J. ENVTL. ECON. & MGMT. 22, 41 (1998);

<sup>101</sup> See Jodi Hilty & Adina M. Merenlender, *Studying Biodiversity on Private Lands*, 17 CONSERVATION BIOLOGY 132, 136 (2003); Vicoria J. Dreitz & Fritz L. Knopf, *Mountain Plovers and the Politics of Research on Private Lands*, 57 BIOSCIENCE 681, 681 (2007); Amara Brook, Michaela Zint & Raymond De Young, *Landowners' Responses to an Endangered Species Act Listing and Implications for Encouraging Conservation*, 17 CONSERVATION BIOLOGY 1638, 1638 (2003)..

<sup>102</sup> See Hilty & Merenlender, *supra* note \_\_, at 133.

<sup>103</sup> Among other things, “a private landowner might be the only individual who knows a listed species is on his or her land.” See Jason F. Shogren, Rodney B. W. Smith, & John Tschirhart, *The Role of Private Information in Designing Conservation Incentives for Property Owners*, in SPECIES AT RISK: USING ECONOMIC INCENTIVES TO SHELTER ENDANGERED SPECIES ON PRIVATE LANDS 217 (Jason F. Shogren ed., 2005); see also James Salzman, *Creating Markets for Ecosystem Services*, 80 N.Y.U. ENVTL. L. REV. 916 (2005) (noting information asymmetry between government regulators and private landowners); David S. Wilcove & Joon Lee, *Using Economic and Regulatory Incentives to Restore Endangered Species: Lessons Learned from Three New Programs*, 18 CONSERVATION BIOLOGY 639, 640 (2004) (noting likely underestimate of endangered species on private land due to “the reluctance of many private landowners to cooperate with surveys for endangered species”).

<sup>104</sup> Ferraro, McIntosh & Ospina, *supra* note \_\_, at 246; Bonnie Harlee, Myungsup Kim, and Michael Nieswiadomy, *Political Influence on Historical ESA Listings by State: A Count Data Analysis*, 140 PUBLIC CHOICE 21 (2009). Harlee, et al. survey the relevant academic literature at 23-24.

There is also evidence that non-scientific criteria influences which species are studied and how conservation resources are allocated. See, e.g., Morgan J. Trimble & Rudi J. Van Aarde, *Species Inequality in*

government to adopt various regulatory measures with significant economic consequences. With so much at stake, it would be surprising if political and other factors did not influence listing decisions.

### *B. Statutory Charade*

The ESA dictates that the decision whether to list a species as endangered or threatened is supposed to be a purely scientific decision. Section 4 of the Act requires that the decision be based “solely on the basis of the best scientific and commercial data available”<sup>105</sup> Yet in many respects, this is an impossible standard to meet.<sup>106</sup> As Professor Wyman notes, “decisions to list and delist species cannot, and are not, determined solely by science without input from policy considerations.”<sup>107</sup> As a consequence, ESA listing decisions necessarily embody the science charade in species conservation. Indeed, the science charade is written into the Act.<sup>108</sup>

For a given organism to qualify as an “endangered species” under the ESA, the FWS must conclude both that it is a “species” as defined by the Act (which, as noted above, need not

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*Scientific Study*, 24 CONSERVATION BIOLOGY 886 (2010); Andrew Metrick & Martin L. Weitzman, *Patterns of Behavior in Endangered Species Preservation*, 72 LAND ECON. 1 (1996).

<sup>105</sup> See 16 U.S.C. §1533(b)(1) (emphasis added).

<sup>106</sup> Doremus, *Listing*, *supra* note \_\_, at 1035 (“Congress has forced the listing of species into a ‘science charade,’ in which they must pretend to make non-scientific decisions entirely on the basis of science.”).

<sup>107</sup> Wyman, *Politics*, *supra* note \_\_, at 99.

<sup>108</sup> As Professor Doremus notes, “the ESA’s current requirement that listing decisions rest solely on science . . . has forced the listing agencies into a ‘science charade,’ in which they must pretend to make non-scientific decisions entirely on the basis of science.” See Doremus, *Listing*, *supra* note \_\_, at 1035.

mean that is actually a separate species, as opposed to a subspecies or distinct population<sup>109</sup>), as well as that it is endangered. Neither of these determinations is purely scientific.<sup>110</sup> As a consequence, “science often will be unable to determine whether a population of organisms is a species as defined in the Act.”<sup>111</sup>

“Species” is defined to include species, subspecies and distinct populations.<sup>112</sup> This definition, though expansive, is “singularly uninformative.” As Professor Doremus notes, “[i]t is merely a list masquerading as a definition.”<sup>113</sup> It provides little guidance as to what constitutes a distinct species or subspecies, or what makes a population segment “distinct.” Insofar as this language is ambiguous, it delegates authority to the FWS to clarify the scope of what can, or cannot, be listed.<sup>114</sup> Such a grant of interpretive authority does not confine the FWS to scientific considerations, however. Rather, it expressly empowers the agency to make policy judgments.

Determining what constitutes a separate and distinct species or subspecies is not as simple as a non-scientist might think. There is substantial disagreement over how to define a species as a taxonomic unit. Literature surveys have found over two-dozen different concepts for

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<sup>109</sup> See *infra* notes \_\_ and accompanying text.

<sup>110</sup> See Wyman, *Politics*, *supra* note \_\_, at 102 (“Neither the taxonomic decision nor the risk assessment underlying a listing decision is a purely scientific exercise.”); Doremus, *Listing*, *supra* note \_\_, at 1088 (“both prongs of the listing decision force the agencies to look beyond scientific information.”).

<sup>111</sup> See Wyman, *Politics*, *supra* note \_\_, at 102.

<sup>112</sup> 16 U.S.C. § 1532(16) (“The term “species” includes any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature.”).

<sup>113</sup> See Doremus, *Listing*, *supra* note \_\_, at 1089.

<sup>114</sup> See *Chevron USA v. Natural Resources Defense Council*, 468 U.S. 1227 (1984).

how to define a species.<sup>115</sup> Even if one focuses simply on a small set of factors, such as genetic variance or a degree of reproductive isolation, there is no universally accepted rule for how species should be defined.<sup>116</sup> By some accounts, “there are no ‘rules’ in taxonomy as to what constitutes a species (or subspecies), nor consistently applied thresholds for defining them within or across different kinds of organisms.”<sup>117</sup>

That the ESA authorizes – indeed, compels – listing subspecies and distinct population segments as endangered and threatened species introduces further opportunities for normative judgements to influence purportedly scientific outcomes. If it is hard to define what qualifies as a distinct species, determining what constitutes a subspecies is even more difficult.<sup>118</sup> When it comes to determining what is a “distinct population segment,” the lines are fuzzier still. Indeed, a distinct population segment “is not a scientific concept,” and is quite malleable in application.<sup>119</sup> As commonly defined, “the distinct population segment combines a biological description of the relationships [among species population] with a clear value judgment as to whether a population is important.”<sup>120</sup> As with defining what constitutes a species or subspecies, science has an

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<sup>115</sup> See Carolan, *Politics*, *supra* note \_\_, at 453; see also Jason Scott Johnston, *Introduction*, in *INSTITUTIONS AND INCENTIVES IN REGULATORY SCIENCE* 7 (Jason Scott Johnston ed. 2012).

<sup>116</sup> See Doremus, *Listing*, *supra* note \_\_, at 1099 (“What degree of reproductive isolation would justify recognition of a distinct species cannot be answered on any objective, universally-applicable basis.”).

<sup>117</sup> See Rob Roy Ramey, *On the Origin of Specious Species*, in *INSTITUTIONS AND INCENTIVES IN REGULATORY SCIENCE* 84 (Jason Scott Johnston ed. 2012).

<sup>118</sup> See Wyman, *Politics*, *supra* note \_\_, at 103 (“Science provides even less guidance on what counts as a subspecies than a species because there is little agreement on the degree of differentiation required for a population to count as a separate subspecies.”).

<sup>119</sup> See Wyman, *Rethinking*, *supra* note \_\_, at 516.

<sup>120</sup> See Emma Marris, *The Species and the Specious*, 446 *NATURE* 250, 252 (2007).

essential role to play in this inquiry, but the ultimate judgment does not represent a purely scientific conclusion.

In the context of delineating species, the lack of a single, universally accepted set of taxonomic criteria leaves researchers to make value judgments – judgments about whether it is better to err on the side of differentiating two organisms or not.<sup>121</sup> “The choice is one of convenience, usefulness for a specific purpose, or aesthetic judgment, not the objective, universal sort of determination of the public expects from ‘science,’” notes professor Doremus.<sup>122</sup>

What degree of genetic difference or reproductive isolation is required for two organism populations to be considered two separate species or subspecies? Such choices are also not made behind a veil of ignorance as to their likely effects. Given the existence of the ESA, the decision to err on the side of differentiating species, subspecies and distinct populations will, on the whole, lead to a greater number of species listings, triggering ever more regulation. The value-based choice as to whether to err on the side of greater differentiation is not made in a vacuum, but in full view of the practical policy consequences such a choice will have.<sup>123</sup>

The science charade is arguably even greater when it comes to determining what constitutes an “endangered” or “threatened” species. Here the Act expressly prohibits the FWS from relying upon anything other than the “best scientific and commercial data available.”<sup>124</sup> Yet

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<sup>121</sup> See Carolan, *Politics*, *supra* note \_\_\_, at 451.

<sup>122</sup> See Doremus, *Listing*, *supra* note \_\_\_, at 1100.

<sup>123</sup> See, e.g., STEVEN LEWIS YAFFEE, PROHIBITIVE POLICY: IMPLEMENTING THE FEDERAL ENDANGERED SPECIES ACT 76 (1982). Yaffee quotes a biologist pointing out that the more organisms are differentiated, “the more protection you end up with.” *Id.*

<sup>124</sup> See 16 U.S.C. § 1533 (b) (“The Secretary shall make determinations required by subsection (a)(1) *solely* on the basis of the best scientific and commercial data available to him after conducting a review of the status of the species. . .”(emphasis added)).

the terms “endangered” and “threatened,” though defined in the Act, are not scientifically determinate either.<sup>125</sup>

In order to determine that a given species is “in danger of extinction throughout all or a significant portion of its range,” one has to determine what constitutes a meaningful “danger,” as well as what constitutes a “significant portion” of the species’ range. These determinations necessarily involve assessing risks and making value judgments about how to evaluate threats. After all, all species face some threat of extinction, however remote.<sup>126</sup> In this respect, the judgment is not particularly different than ones that must be made by other environmental agencies.<sup>127</sup> Here again, science has an essential role to play in helping to identify and quantify potential risks to species. Yet science alone is not capable of determining whether a species is endangered.<sup>128</sup> Ultimately, FWS must make a policy judgment as to how precautionary it chooses to be in defining and applying the relative terms. In pretending to make such

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<sup>125</sup> See Doremus, *Listing, supra* note \_\_\_, at 1117 (“Like ‘species,’ the terms ‘endangered’ and ‘threatened’ cannot be defined strictly on the basis of scientific information as that term is understood by the public, scientists and the legislature”). At least one judge has recognized this fact. See *Defenders of Wildlife v. Salazar*, 729 F. Supp. 2d 1207, 1210 (D.Mont. 2010) (“it is not necessarily the case that threatened or endangered status can be determined solely on the basis of scientific evidence alone. Beyond the question of risk is the issue of the acceptability of risk.”).

<sup>126</sup> See Doremus, *Listing, supra* note \_\_\_, at 1113 (“Since all species face some finite risk of extinction, all would appear to merit protection unless some additional content is given to the statutory terms.”).

<sup>127</sup> See, e.g., 42 U.S.C. § 7521 (requiring the Environmental Protection Agency to regulate emissions of pollutants that, in the “judgment” of the EPA Administrator, “cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare”).

<sup>128</sup> See Michael S. Carolan, *Is It a Distinct Subspecies? Preble’s Mouse and the ‘Best Available Science’ Mandate of the Endangered Species Act*, 21 SOCIETY & NAT. RES. 944, 947 (2008) (“deciding when a species is safe versus endangered (and this in need of protection) is really a question of how much risk a society is willing to take with that species. And since there is no ‘correct’ level of risk, such decisions rest upon policy rather than scientific choices.”); see also Doremus, *Listing, supra* note \_\_\_, at 1035(, “science alone cannot answer all the relevant questions. Science cannot tell us whether a group of organisms has value to society, or what risk of extinction society should tolerate.”)

determinations on a purely scientific basis – in accordance with the ESA’s requirements – the FWS engages in the science charade.<sup>129</sup>

#### IV. THE CHARADE OF ESA SCIENCE REFORM

Just as the ESA submerges normative policy judgments under a veneer of scientific decision-making, those seeking ESA reform – and their opponents – routinely characterize their position as a defense of “sound science.” Over the past twenty years, members of Congress have introduced dozens of ESA reform proposals that purport to address the problem of “junk science” in species listing and critical habitat designations.<sup>130</sup> These reforms purport to solve some of the ESA’s problems by mandating the consideration of additional information, such as research or data provided by state and local governments, imposing additional procedural requirements, such as peer review, or otherwise mandating measures to increase “transparency” or “accountability.”

The various science-oriented reforms of the ESA are themselves examples of the science charade in species conservation. Whether good or bad, many of these reforms don the mantle of

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<sup>129</sup> See Doremus, *Listing*, *supra* note \_\_\_, at 1122 (“Rather than freeing these decisions from political influences, the strictly science mandate has helped the agencies hide the impact of those influences.”).

<sup>130</sup> See Jimmy Tobias, *The Endangered Species Act Gets Some New Scientific Armor*, PACIFIC STANDARD, Sept. 19, 2016, <https://psmag.com/news/the-endangered-species-act-gets-some-new-scientific-armor> (“During the 114th Congress alone, Republicans have introduced more than 100 bills and legislative maneuvers meant to erode the scientific integrity of the Endangered Species Act.”). For an index of ESA reform bills, see Center for Biological Diversity, “Attacks on the Endangered Species Act,” [http://www.biologicaldiversity.org/campaigns/esa\\_attacks/table.html](http://www.biologicaldiversity.org/campaigns/esa_attacks/table.html).

science, when they are really about something else.<sup>131</sup> What is controversial about the ESA is not that species are listed on “bad science,” but that environmental activists and progressive administrations tend to prefer a more precautionary and pro-regulatory approach to species conservation than do many industries and anti-regulatory administrations. Some would prefer to err on the side of assuming a species is in greater danger of extinction than it may be, and adopting protective regulatory measures as a precaution. Others take the opposite view. Yet as scientific determinations, such as the decision to list a particular species, is what drives the ESA’s regulatory measures, science is where reform efforts often focus, and the underlying differences on normative policy questions (such as how precautionary species conservation regulations should be) are submerged.

Were a member of Congress to argue that precautionary regulation to help conserve endangered species was unwarranted, or that relieving local economies of regulatory burdens is preferable to increase the risk that some species disappear from certain parts of the country if not go extinct altogether, this position would necessarily risk alienating important political constituencies. By instead calling for “sound science,” those urging reform can engage in the charade of advancing a more neutral value – scientific policymaking.

Those criticizing contemporary reform proposals likewise seek to cloak their positions in the mantle of science. Former Representative John Dingell, who is often credited with authoring the ESA, told an interviewer that “[t]he ESA was written so that scientific principles would be

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<sup>131</sup> See Meazell, *supra* note \_\_\_, at 736 (“Calls for ‘good’ or ‘improved’ science in agencies are often motivated by the desire to change policy outcomes rather than agencies’ use of flawed science in reaching them.”).

used to protect species. Science would make the decisions, science would decide the case.”<sup>132</sup>

According to Dingell, those who wish to reduce the ESA’s regulatory burdens are “a bunch of antiscience ignoramuses.”<sup>133</sup> The editorial board of the *New York Times* echoed this view, albeit in less inflammatory tones, declaring that the ESA’s “purpose is to base protections on science.”<sup>134</sup> According to the *Times*, a Congressional decision to delist a population of gray wolves, so as to relieve local communities of associated regulatory burdens, represented the triumph of politics over science.<sup>135</sup>

Although Section 4 requires that listing decisions are made on the “best available” scientific information, this information is inevitably incomplete.<sup>136</sup> Subsequent research will often challenge the assumptions upon which a listing decision was made, such as when it is discovered that a species is more abundant than initially believed or researchers urge the revision of a taxonomic classification. This does not mean that the science upon which such decisions are made is “junk” or inadequate. Indeed, the very language of the ESA, in particular the “best

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<sup>132</sup> Quoted in Christopher Ketcham, *Inside the Effort to Kill Protections for Endangered Animals*, NATL GEO., May 19, 2017, [http://news.nationalgeographic.com/2017/05/endangered\\_speciesact/](http://news.nationalgeographic.com/2017/05/endangered_speciesact/).

<sup>133</sup> Quoted in Christopher Ketcham, *Inside the Effort to Kill Protections for Endangered Animals*, NATL GEO., May 19, 2017, [http://news.nationalgeographic.com/2017/05/endangered\\_speciesact/](http://news.nationalgeographic.com/2017/05/endangered_speciesact/).

<sup>134</sup> *A Hole in the Endangered Species Act* (editorial), N.Y. TIMES, Apr. 21, 2011.

<sup>135</sup> As Professor Wyman notes, “it is difficult to maintain” that this action was “the first time that politics has influenced which species are protected under the Act.” Wyman, *Politics*, *supra* note \_\_, at 99.

<sup>136</sup> See Murphy & Weiland, *supra* note \_\_, at 5 (“The wildlife agencies rarely, if ever, have the data and analyses that believe are sufficient to make fully informed decisions regarding at-risk species in natural systems.”).

available science” requirement, implicitly acknowledges that ESA determinations will sometimes be based upon weak or incomplete evidence.<sup>137</sup>

The Act’s emphasis on the best *available* science necessarily allows for listings to occur based upon incomplete information.<sup>138</sup> Whereas some environmental statutes require agencies to make a threshold finding based upon some minimum of evidence, the ESA adopts a more precautionary posture, dictating that listing decisions should be made upon what science and information is available, whether or not it is comprehensive or reliable.<sup>139</sup> This is not unscientific. Rather it reflects the fact that those species that are most imperiled will often be those about which the least is known.<sup>140</sup> For good or ill, this standard reflects a normative judgment on the part of Congress that listings should be somewhat precautionary – that it is preferable to list a species today, based upon what is known, than to wait for the accumulation of additional information which may lead to a more accurate judgment.

In some cases, constraining or burdening the use of available scientific data could do more than constrain regulation. The “best available” requirement means that government

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<sup>137</sup> See Doremus, *Listing*, *supra* note \_\_, at 1075 (“By calling for reliance on the ‘best available’ scientific information, Congress explicitly recognized that in some circumstances the scientific evidence supporting listing determinations might be weak.”).

<sup>138</sup> Doremus, *Listing*, *supra* note \_\_, at 1035-36 (“Because so little is known about so many disappearing species, the best available scientific evidence is often highly uncertain.”).

<sup>139</sup> The precautionary posture of the ESA can also be seen in Section 7, which requires agencies to ensure that their actions will not jeopardize a listed species. See also Daniel J. McGarvey, *Merging Precaution with Sound Science under the Endangered Species Act*, 57 BIOSCIENCE 65 (2007).

<sup>140</sup> That this is a rational and defensible approach to listing species does not necessarily mean that it was a conscious choice by the ESA’s authors. According to Holly Doremus, when the ESA was adopted “[l]egislators offered little indication of why they felt that consideration of the best available scientific data was important, or what agencies should do if the available scientific data proved incomplete or equivocal.” See Holly Doremus, *Science and Controversy*, in THE ENDANGERED SPECIES ACT AT THIRTY: CONSERVING BIODIVERSITY IN HUMAN-DOMINATED LANDSCAPES VOL. 2, 97 (J. Michael Scott, Dale D. Goble & Frank W. Davis eds 2006).

officials look at the best there is, however good or bad that may be. If, however, the FWS can only list if the best available data exceeds some predetermined quantitative or qualitative threshold, this necessarily alters the extent to which listing serves an informational function, communicating our best assessment of how at risk a species may or may not be. Such reforms could preclude conservation efforts even where such action would be desirable despite the lack of greater scientific certainty. Inhibiting the communicative function of the listing process could also inhibit even non-regulatory and NGO conservation efforts that rely upon the endangered and threatened lists to help set their conservation priorities. Because science and research on the rarest species may (necessarily) be more limited, threshold requirements for listing adopted in the name of science would have greatest effect on rarest species, some of those most in need of protection

Reforms that require additional procedural steps, such as additional peer review or specific types of studies or assessments, will serve to delay listing decisions. Insofar as listing a species (alone, or in combination with program funding<sup>141</sup>), such measures could undermine the ESA's effectiveness insofar as they delay listing and subsequent conservation efforts.<sup>142</sup>

Requiring additional research, peer review, or the accumulation of some minimal quantum of research before a species could be listed might reduce the number of species delisted due to data errors, but at the expense of losing species that go extinct awaiting listing.<sup>143</sup>

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<sup>141</sup> See *infra*.

<sup>142</sup> Doremus, *Listing*, *supra* note \_\_, at 1146 (a statutory peer review requirement would add to the administrative burdens of listing without noticeably increasing the reliability or accuracy of listing decisions.”).

<sup>143</sup> See Ruhl, *Prescribing*, *supra* note \_\_, at 405 (“What a hollow victory for sound science it would be, for example, to spend so much time ensuring the reliability of the data proving the species is endangered that the species is already extinct by the time the decision to protect it is made.”).

Some commentators suggest that ESA science should be subjected to the standards for scientific evidence.<sup>144</sup> Specifically, they argue that courts should apply the standards adopted by the Supreme Court in the “*Daubert* trilogy” of cases<sup>145</sup> when evaluating the science underlying agency regulatory decisions. Such proposals could make it easier to challenge ESA implementation decisions in court, but they would be unlikely to improve the quality of agency decisionmaking under the ESA. As Professor David Bernstein has explained, the problem that the *Daubert* trilogy of cases sought to address – the potential for “junk science” to unduly influence lay juries in the context of litigation – is quite different from the alleged problems with the use of science under the ESA.<sup>146</sup> Agencies, unlike juries, are well aware of the limitations of the scientific methodologies and studies upon which they rely. Insofar as agencies choose to rely upon incomplete or uncertain scientific conclusions when making regulatory decisions, it is because they are required to do so under the relevant statutory provisions, or because they have chosen to exercise their discretion to adopt particular types of policies, such as a more precautionary or pro-regulatory approach to species conservation.

Many science-oriented reforms are redundant with existing administrative law norms, such as the requirement that agencies engage in reasoned decisionmaking.<sup>147</sup> Others would

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<sup>144</sup> See, e.g., J. Tavener Holland, *Regulatory Daubert: A Panacea for the Endangered Species Act's "Best Available Science" Mandate?*, 39 MCGEORGE L. REV. 299 (2008). For a broader argument in favor of “regulatory *Daubert*,” see Alan Charles Raul & Julie Zampa Dwyer, “*Regulatory Daubert*”: A Proposal to Enhance Judicial Review of Agency Science by Incorporating *Daubert* Principles into Administrative Law, 66 LAW & CONTEMP. PROBS. 7 (2003).

<sup>145</sup> See *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993); *General Electric Co. v. Joiner*, 522 U.S. 136 (1997); *Kumho tire Co v. Carmichael*, 526 U.S. 137 (1999).

<sup>146</sup> See David E. Bernstein, *What to Do About Federal Agency Science: Some Doubts About Regulatory Daubert*, 22 GEO. MASON L. REV. 549 (2015)

<sup>147</sup> See Ruhl, *Prescribing*, *supra* note \_\_\_, at 401 (“many of the methodological components of science are already firmly embedded in environmental law through basic standards of administrative law prescribed under the Administrative Procedure Act”).

paradoxically make the science charade worse, by further burying the underlying normative judgments that are necessarily a part of species conservation policy.<sup>148</sup> An inordinate focus on science also sidelines the more important normative debate about trade-offs and distributional consequences of competing species conservation strategies. Agencies should be rewarded, not punished, for greater candor about the normative, discretionary judgments they make when implementing a complex regulatory statute like the ESA.<sup>149</sup>

## V. ENDING THE CHARADE

Escaping the science charade in species conservation requires greater candor about science’s role identifying and conserving imperiled species. This is unlikely to be achieved by current reform proposals. It can, however, be aided by reforms that help to clarify the role that science does – and does not – play in identifying which species are in need of assistance, and what form such assistance must take.<sup>150</sup>

There is no problem with the “best available science” standard insofar as it directs the FWS to rely upon whatever scientific research and data is available at the time that a listing decision must be made. Traditional standards of judicial review of agency action, including the requirement that agencies demonstrate that they engaged in reasoned decisionmaking and

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<sup>148</sup> Doremus, *Listing*, *supra* note \_\_, at 1035 (“Calls for better science simply reinforce the science charade, exacerbating the problems it has created.”).

<sup>149</sup> See Ruhl, *Prescribing*, *supra* note \_\_, at 404 (“science, even sound science, usually does not lead to compelling answers about the questions posed in environmental law.”).

<sup>150</sup> Wagner, *supra* note \_\_, at 1628 (“if policy decisions are to receive appropriate public scrutiny, science-policy decisionmakers must be extremely forthright in distinguishing policy judgments from scientific facts.”).

considered the information and objections in the record, are sufficient. Such standards must be applied faithfully, however. The proverbial “hard look” must, in fact, be a hard look. Agency invocation of science should not be enough to invoke the sort of “super-deference” often applied under *Baltimore Gas*.

Under traditional administrative law notions of reasoned decision-making, agencies should be required to be candid and transparent about what science does and does not show. Agencies should be required to acknowledge their premises and presumptions, as well as the policy judgments that inform implementation. Contrary to the suggestion of some reformers, agencies should *not* be categorically precluded from acting on incomplete or uncertain science. If the best available data suggests a species is endangered, an agency should not be precluded from saying so (though what should be done about such a determination is another matter).

Legislative reforms could be adopted to relieve pressure on endangered species science and reduce the incentive for agencies (and policymakers) to engage in the science charade. In particular, the listing process should be insulated from political and economic pressure. At present the ESA’s “protections” are triggered once a species is listed, irrespective of their value for that particular species.<sup>151</sup> As a consequence, the ESA’s current regulatory structure both discourages conservation and compromises conservation science.

One possible remedy for this problem, suggested by Professor Wyman is “decoupling” the listing decision from mandatory conservation measures.<sup>152</sup> This would release the pressure to manipulate listing decisions and enable federal agencies “to develop protections tailored to the

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<sup>151</sup> Bean, *supra* note \_\_, at 373 (noting that species are listed without regard for whether the Act’s prohibitions “address the threats that imperil a species”).

<sup>152</sup> Wyman, *Rethinking*, *supra* note \_\_, at 516.

needs of each species and its circumstances.” At present, however, the ESA’s “protections” are triggered once a species is listed, irrespective of their value for that particular species.

Decoupling could make species listing decisions less contentious and monumental, and reduce the time and expense it takes for such decisions to be made. FWS biologists would be able to focus on getting the science right, and devote less time responding to litigation. While it would still make sense for listing to trigger a legal obligation for the FWS to develop a conservation strategy and recovery plan, it would not force the imposition of specific regulatory controls. This would mean that outside organizations would no longer be able to use endangered species as a proxy for other battles. As Professor Wyman explains, “One of the advantages of decoupling the listing of a species from decisions about how it should be protected is that there should be greater room for developing creative measures tailored to species’ needs and circumstances.”<sup>153</sup> Such an approach could facilitate the development of more tailored and cost-effective conservation strategies for specific species and “might reduce the contentiousness of listing decisions by reducing the momentousness of listing.”<sup>154</sup>

Decoupling could be achieved in multiple ways. The surest way to decouple the listing decision from regulation would be to completely disarm the trigger. Under such a “hard decoupling” approach, listing a species as endangered would no longer trigger mandatory imposition of prohibition on habitat modification. Agencies would have to develop and propose specific conservation measures for each listed species. In many respects, this would mean treating endangered species as threatened. A benefit of this approach would be that it would

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<sup>153</sup> Wyman, *Rethinking*, *supra* note \_\_, at 519.

<sup>154</sup> Wyman, *Rethinking*, *supra* note \_\_, at 516.

dramatically reduce the incentive to influence or manipulate listing decisions because no regulatory consequences would follow automatically from a listing decision. A decision to list a species would be just that – a decision to include a species (or subspecies, or distinct population) on a list – and not a de facto decision to impose regulatory constraints on economic activity.

A risk of a “hard decoupling” approach would be that many listed species would languish and receive no benefit from listing. At present, the FWS often lags in fulfilling its obligation to designate critical habitat or promulgate recovery plans. Freed of any obligation to take specific steps, or impose specific regulatory limitations on activities that may harm listed species, it is possible that the FWS might not act. It is possible that private conservation organizations and state wildlife agencies would take some steps in response to species listings in the absence of mandatory federal regulatory response, but unlikely that such efforts would be sufficient.

An alternative would be to adopt a “soft decoupling” approach, such as that suggested by Professor Wyman, under which existing regulatory restrictions are imposed and maintained on a temporary basis until the FWS identifies and adopts a more cost-effective conservation strategy for the species in question.<sup>155</sup>

## CONCLUSION

Calls for more or “better” science, or greater judicial scrutiny of use of science in ESA implementation will not address ESA’s underlying problems.<sup>156</sup> Insofar as such reforms increase

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<sup>155</sup> See Wyman, *Rethinking*, *supra* note \_\_, at 517.

<sup>156</sup> As Professor Doremus counsels, “policymakers must realize that simply characterizing a question as scientific does not guarantee an answer which is either objective or reliable.” Doremus, *Listing*, *supra* note \_\_, at 1065.

the time and cost of making decisions and implementing policies they may frustrate conservation efforts, but without underlying rationale. Delaying the listing of species may be an effective way to forestall the regulatory costs of species conservation under the ESA, but it does not make for more effective species conservation, nor does it insulate science from political pressure.

Science has an indispensable role to play in species conservation, as it does in environmental law more generally. Science is necessary to inform policymakers at all stages of the policymaking process. Science can help diagnose existing environmental problems, as well as to identify and evaluate potential solutions. In order for science to perform this role most effectively, agencies should be encouraged to be candid about what science can and cannot do. The uncertainties and limitations of existing research must be acknowledged. The normative premises that shape how science is evaluated and deployed must be exposed. Most importantly, science should not be used as a shield for normative policy judgments. Engaging in the science charade encourages science politicization and undermines political accountability, neither of which is conducive to sound environmental policy.