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Strength in Numbers: Setting Quantitative Criteria for Listing Species Under the Endangered Species Act

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STRENGTH IN NUMBERS: SETTING QUANTITATIVE CRITERIA FOR LISTING SPECIES UNDER THE ENDANGERED SPECIES ACT

By Kalyani Robbins

- I. INTRODUCTION
- II. AN OVERVIEW OF THE ESA AND LISTING SPECIES
 - A. In the Beginning: The Evolution of U.S. Endangered Species Legislation and Listing Priorities
 - B. The ESA Listing Process 101
 - C. Lock, Stock, and Barrel: The Benefits of Getting Past the Velvet Rope
- III. DOOMED FROM THE START: HISTORY OF A FLAWED AND DAMAGED LISTING SYSTEM
 - A. A Poorly Articulated Directive: Ambiguity and Excessive Discretion
 - 1. This “Best” is Better Than What, Exactly?
 - 2. How Endangered is Endangered? How Threatened is Threatened?
 - 3. That’s a Lot of Discretion
 - B. The Fallibilities of Science In Relation to the ESA
 - 1. Science Cannot Determine Policy
 - 2. Nothing is Certain: Deal With It
 - C. Turning Lemons into Lemons: The Sloppy Application of Poor Instructions
 - D. Plenty of Blame to Go Around: The Intense Political Pressures on the Listing Process
- IV. THERE IS HOPE: SETTING QUANTITATIVE CRITERIA LEADS TO GOOD POLICY, GOOD SCIENCE, AND LESS CONFUSION
 - A. Setting Quantitative Criteria Will Improve and Legitimize the Listing Process
 - B. Setting Quantitative Criteria IS the Best Available Science
 - C. The Scientist-Developed IUCN Listing Criteria: America’s Next Top Model?
- V. WHICH BRANCH MIGHT HAVE THE MOST SWAY?
 - A. The Regulatory Approach
 - B. Statutory Amendment by Congress
 - C. Pressure from the Courts
- VI. CONCLUSION

I. INTRODUCTION

For the animal shall not be measured by man. In a world older and more complete than ours, they move, finished and complete, gifted with extensions of the senses we have lost or never attained, living by voices we shall never hear. They are not brethren, they are not underlings, they are other nations caught with ours in the net of life and time, fellow prisoners of the splendour and travail of the earth.¹

Most Americans spend the majority of our time in artificial environments of our own making. We live indoors, in a sealed-off land of bug spray, temperature control, and an array of antibacterial products for our hands, dishes, and countertops. We keep pretty plants alive by providing all of their daily care and allowing them to live in our insect-free environment, then we climb into bed and cuddle up to our furry four-legged companions. We have developed a widely-shared, albeit completely unscientific, hierarchy of life-forms. It seems innocent enough; even children know that there are cool animals at the zoo, but worms are icky. Yet we do this at our own peril, because as comfortable as we have become in our cozy indoor retreats, the real world still surrounds us. We depend upon this natural world both for our aesthetic and spiritual enrichment and for our very survival. In the real world, ecosystems depend upon a biodiversity that does not rank species according to how lovable they are to humans.²

Fortunately, or so it would seem, Congress expressly recognized this disparity between human valuation of species and nature's diverse needs, and stated its intent to

¹ Beston, Henry, *THE OUTERMOST HOUSE: A YEAR OF LIFE ON THE GREAT BEACH OF CAPE COD* 25 (Doubleday, Doran & Co., Inc., 1928).

² See E. O. Wilson, *THE DIVERSITY OF LIFE* xxiii (2d ed. 1999) (“Recent experimental studies on whole ecosystems support what was long suspected: in most cases, the more species living in an ecosystem, the higher its productivity and the greater its ability to withstand drought and other kinds of environmental stress. Since we depend on an abundance of functioning ecosystems to cleanse our water, enrich our soil, and manufacture the very air we breathe, biodiversity is clearly not an inheritance to be discarded carelessly.”). At a time of increasing global climate change, ecosystem resiliency is especially important.

protect species equally.³ Just a few years later, Congress passed the Endangered Species Act (ESA),⁴ intended “to halt and reverse the trend toward species extinction, whatever the cost.”⁵ And not a moment too soon, as species now go extinct at a rate of approximately 100 per day, a rate which continues to rise.⁶ It is, of course, *about* time, as “all species are doomed to extinction on a geological time scale. Our concern for endangered species arises because current rates of extinction far exceed any the world has experienced in the last 65 million years.”⁷

Congress gave us the tools to slow down this frenetically-paced loss of biodiversity, but we have frittered away that opportunity by bickering over which species we like best and our correspondingly variable willingness to make sacrifices to protect them. The best way to free the process of protecting biodiversity from this quagmire is to discipline ourselves and reduce the flexibility that engenders such frequent controversies. Congress expressed its desire to protect species equally, and several decades later it is getting more and more urgent that we establish a means of implementing that goal.

As will be discussed in greater detail below, the route a species must take to reach the protections of the ESA begins with getting placed on a list of either endangered or threatened species. Congress has described this listing process as “the keystone of the

³ The Senate Report connected with earlier endangered species legislation noted that “with each species we eliminate, we reduce the pool of germ-plasm available for use by man in future years. Since each living species and subspecies has developed in a unique way to adapt itself to the difficulty of living in the world's environment, as a species is lost, its distinctive gene material, which may subsequently prove invaluable to mankind in improving domestic animals or increasing resistance to disease or environmental contaminants, is also irretrievably lost.” S. Rep. No. 91-526, at 3 (1969). The same report went on to cite the above Henry Beston quote. *Id.*

⁴ Endangered Species Act of 1973, 16 U.S.C. §§ 1531–1544 (2000).

⁵ *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 184 (1978).

⁶ Tim W. Clark, *A Course on Species and Ecosystem Conservation: An Interdisciplinary Approach*, in YALE SCH. OF FORESTRY & ENVTL. STUDIES, BULLETIN SERIES NO. 105, SPECIES AND ECOSYSTEM CONSERVATION: AN INTERDISCIPLINARY APPROACH 17, 33 (Tim W. Clark et al. eds., 2001).

⁷ Kent E. Holsinger, *Population Biology for Policy Makers: Promises and Paradoxes*, 45 BIOSCIENCE 10 (1995).

Endangered Species Act.”⁸ The importance of getting listing done right becomes obvious when considering the fact that ESA protection is an all or nothing game—either you get it or you don’t—and the only dividing line is listing.⁹ As a prerequisite for the application of any other provision of the Act, listing is the single most important part of the Act.

Our system of listing species, like most others around the world, is based upon the viability of each species. We engage in population viability analysis to determine how a species is faring. That said, the scientific process of population viability analysis needs a set of questions to answer. In other words, what levels of viability are we looking for? Before scientists can determine whether a species fits into a listing category, we must first determine what the criteria are for inclusion in that category. As it stands, we have only loose definitions and factors upon which to base these analyses, resulting in an extreme lack of consistency. As will be discussed further below, I propose the use of *quantitative* criteria for each listing category. Quantitative criteria are numerical thresholds applicable across the board (such as x percentage decline over x years or x generations, x total population remaining, x amount of geographic range, etc.).

Part II of this article provides the background on the listing process that is needed to consider the central arguments of the piece. Part III discusses the numerous problems with the status quo, which combine to prevent us from meaningfully realizing the expectations Congress had for the listing process. Part IV provides the support for my primary thesis—that we can and should devise quantitative listing criteria—and suggests an excellent model from which to work. Finally, Part V considers the various ways to

⁸ H.R. Rep. No. 97-567, at 10 (1982).

⁹ See Daniel J. Rohlf, *There's Something Fishy Going On Here: A Critique of the National Marine Fisheries Service's Definition of Species Under the Endangered Species Act*, 24 ENVTL. L. 617, 619 (1994) (“Although characterized as the ‘pit bull of federal environmental statutes,’ the ESA is as meek as a kitten unless an imperiled creature appears on the statute’s lists of threatened and endangered species.”).

accomplish the goals presented here. The article then concludes with a plea to the new administration to make this change.

II. AN OVERVIEW OF THE ESA AND LISTING SPECIES

A. In the Beginning: The Evolution of U.S. Endangered Species Legislation and Listing Priorities

The first U.S. endangered species legislation, the Endangered Species Preservation Act of 1966,¹⁰ was the result of the Department of Interior's effort to obtain funding for an endangered species program, after failed attempts to get that funding absent a preservation statute.¹¹ The 1966 Act required the Secretary of the Interior to list species that were threatened with extinction,¹² in consultation “with various scientific groups having expertise in this field.”¹³ The Departments of Interior, Agriculture, and Defense were all charged with protecting these species and their habitats.¹⁴

Next came the Endangered Species Conservation Act of 1969,¹⁵ which expanded on protections for invertebrate species and restrictions on interstate commerce in listed species.¹⁶ The 1969 Act included listing language still in use today, requiring the decisions be based on “the best scientific and commercial data available.”¹⁷ The term “commercial data” refers only to data that goes to a species' vulnerability—such as threats from overutilization in commerce—and not to the consideration of economic

¹⁰ Pub. L. No. 89-669, 80 Stat. 926 (1966). A discussion of the Act's provisions may be found in Michael J. Bean, *THE EVOLUTION OF NATIONAL WILDLIFE LAW* 319-21 (revised and expanded ed. 1983).

¹¹ See S. Rep. No. 89-1463, at 1, 2, 17 (1966).

¹² Pub. L. No. 89-669, § 1(c).

¹³ S. Rep. No. 89-1463, at 3.

¹⁴ Pub. L. No. 89-669, § 1(b).

¹⁵ Pub. L. No. 91-135, 83 Stat. 275 (1969). A discussion of the Act's provisions may be found in Bean, *supra* note 10, at 374-79.

¹⁶ See Pub. L. No. 91-135, §§ 1(2), 2, 4(d), 12(a).

¹⁷ *Id.* § 3(a).

factors, as Congress later clarified.¹⁸ While the legislative history does not elucidate the meaning of “best scientific data available,” a “plausible explanation is that Congress intended through this language to continue the 1966 Act's requirement that Interior seek input of independent biologists before making listing decisions.”¹⁹ If this explanation is true, an obvious goal behind that effort would be to increase objectivity and consistency.

In 1973 the ESA, which was made possible by the enormous political support for environmental ideals at the time, became “the most comprehensive legislation for the preservation of endangered species ever enacted by any nation.”²⁰ Among the numerous improvements (from the preservation perspective) it set forth were the inclusion of species not yet on the brink of the abyss,²¹ protection for plant species,²² prohibitions of private actions on private land,²³ and a requirement that federal agencies must not jeopardize the continued existence of a protected species.²⁴ The ESA's 1982 amendments also made a key change to the listing process, adding the word “solely” before the existing language of listing “on the basis of the best scientific and commercial information available,”²⁵ thus creating the somewhat controversial “strictly science mandate.”²⁶ The purpose of this change was to do away with the irrelevant economic

¹⁸ H.R. Rep. No. 97-567, at 20 (1982).

¹⁹ Holly Doremus, *Listing Decisions Under the Endangered Species Act: Why Better Science Isn't Always Better Policy*, 75 WASH. U. L.Q. 1029, 1043 (1997).

²⁰ *Tenn. Valley Auth. v. Hill*, 437 U.S. at 174.

²¹ See Pub. L. No. 93-205, §§ 3(15), 4(d). Threatened status was to be granted generously to any species at a “measurable risk” of extinction. H.R. Rep. No. 93-412, at 11 (1973).

²² See Pub. L. No. 93-205, § 3(11).

²³ See *id.* § 9.

²⁴ See *id.* § 7.

²⁵ 16 U.S.C. § 1533(b)(1).

²⁶ For an in-depth discussion of this requirement, see generally Doremus, *supra* note 19.

impact analyses being conducted by the Reagan administration and require listing determinations to be purely about a species' biological condition.²⁷

At several points in the evolution of the ESA, Congress has made clear that the listing process was intended to move forward as quickly and efficiently as possible. First, in explaining why the 1969 Act did not require the formal Administrative Procedure Act procedures to be followed, Congress stated that “[i]f the full right of hearing and judicial review is granted, the publication of the final list may be delayed for many months—months which may be crucial in determining whether a given species or subspecies will be able to survive.”²⁸ In 1979, concerned with the slow pace of listings that had resulted in only a tiny percentage of listings out of the thousands of candidates,²⁹ Congress established a priority system for considering species for listing.³⁰ By 1988, delay had gotten out of control, with over 3000 candidate species, including nearly 1000 already deemed eligible but not yet listed, and only about 50 species being listed per year.³¹ Congress noted that this rate would result in many species becoming extinct while they waited,³² and directed the Secretary to monitor all candidate species and “make prompt use” of the emergency listing process to prevent such loss.³³

B. The ESA Listing Process 101

The power to list endangered and threatened species belongs to the Secretary of the Interior and the Secretary of Commerce, who have delegated that power to the Fish

²⁷ See H.R. Conf. Rep. No. 97-835, at 20.

²⁸ S. Rep. No. 91-526 (1969).

²⁹ H.R. Rep. No. 96-167 (1979).

³⁰ Act of December 28, 1979, Pub. L. No. 96-159, § 3(6), 93 Stat. 1225-26 (codified at 16 U.S.C. § 1533(h)(3) (1988)).

³¹ Endangered Species Act Amendments of 1988, Pub. L. No. 100-478, 1988 U.S.C.C.A.N. (102 Stat.) 2306.

³² *Id.* at 2707.

³³ Act of Oct. 7, 1988, Pub. L. No. 100-478, § 1002(a), 102 Stat. 2306 (codified at 16 U.S.C. § 1533(b)(3)(C)(iii) (1988)).

and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS), respectively (collectively “the Services”).³⁴ The majority of species—terrestrial species and freshwater fish—are the responsibility of FWS, whereas NMFS is generally charged with the protection of marine species and anadromous fish, such as salmonids.

A species is endangered if it “is in danger of extinction throughout all or a significant portion of its range,”³⁵ and it is threatened if it “is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.”³⁶ In determining whether a species fits into one of these two categories, the Services must consider five 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.³⁷

While these factors do constitute “criteria” to consider in determining a species’ listing status, these criteria are highly generalized and subjective. This Article advocates instead for *quantitative* criteria, which are more objective and consistent from one species to the next.

³⁴ 16 U.S.C. § 1533(c)(1). 50 C.F.R. § 402.01(b) (2006).

³⁵ 16 U.S.C. § 1532(6).

³⁶ *Id.* § 1532(20).

³⁷ *Id.* § 1533(a)(1).

Citizens may petition the Secretary to list, uplist, downlist, or delist a species,³⁸ and the Secretary must acknowledge the petition within thirty days.³⁹ The Secretary has ninety days to determine whether the petition “presents substantial scientific or commercial information indicating that the petitioned action may be warranted.”⁴⁰ In order to qualify, this would be “that amount of information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted.”⁴¹ If the petition passes this bar, the Secretary must then commence a status review of the species,⁴² and is required within twelve months to determine whether the listing is warranted, not warranted, or warranted but precluded by competing demands.⁴³

The final category—warranted but precluded—was the brainchild of the Reagan Administration, putatively to allow those species in greatest need to be addressed first.⁴⁴ It was never intended “to allow the Secretary to delay commencing the rulemaking process for any reason other than the existence of pending or imminent proposals to list species subject to a greater degree of threat.”⁴⁵ In reality, however, it has become a major source of additional discretion, leading to politically-based decisions rather than prioritization on the basis of threat. The category is an ER waiting room strewn with the corpses of those species who were forced to wait too long.

³⁸ *Id.* § 1533(b)(3)(A).

³⁹ 50 C.F.R. § 424.14(a).

⁴⁰ 16 U.S.C. § 1533(b)(3)(A).

⁴¹ 50 C.F.R. § 424.14(b).

⁴² 16 U.S.C. § 1533(b)(3)(A).

⁴³ *Id.* § 1533(b)(3)(B).

⁴⁴ H.R. Rep. No. 97-567 (1982).

⁴⁵ *Id.*

The status review is to be conducted in the same manner for citizen petitions as it is for those initiated by the agency.⁴⁶ The Services have issued policy statements regarding the information standards for the status review process. Some of the requirements thus created are: 1) biologists must evaluate all information used;⁴⁷ 2) these biologists must prefer primary sources wherever possible;⁴⁸ 3) they must also seek out and objectively evaluate data that conflicts with the agency's position on the advisability of the listing;⁴⁹ and 4) the agency must obtain peer review by "three appropriate and independent specialists" for all listing proposals.⁵⁰ Although these procedures generally coincide with those of the scientific method, it is worth noting that no discretion has been relinquished here. The scientists are either agency biologists or, in the case of the three mandatory peer reviews, specialists hand-selected by the agency. In addition to selecting the peer reviewers, the agency is also free to choose not to follow their advice, though it does have to include a summary of their views in the final rule.⁵¹

As noted above, the status review results in one of three possible findings. A negative finding—either not warranted or warranted but precluded—is subject to immediate judicial review.⁵² A warranted finding proceeds with the administrative rulemaking process before listing, and is thus not final agency action subject to review.⁵³

⁴⁶ Kevin Cassidy, *Endangered Species' Slippery Slope Back to the States: Existing Regulatory Mechanisms and Ongoing Conservation Efforts Under the Endangered Species Act*, 32 ENVTL. L. 175, 188 (2002).

⁴⁷ Notice of Interagency Cooperative Policy on Information Standards Under the Endangered Species Act, 59 Fed. Reg. 34, 271 (July 1, 1994).

⁴⁸ *Id.*

⁴⁹ *Id.*

⁵⁰ Notice of Interagency Cooperative Policy for Peer Review in Endangered Species Act Activities, 59 Fed. Reg. 34, 270 (July 1, 1994).

⁵¹ *Id.*

⁵² 16 U.S.C. § 1533(b)(3)(C)(ii).

⁵³ James C. Kilbourne, *The Endangered Species Act Under the Microscope: A Closeup Look From a Litigator's Perspective*, 21 ENVTL. L. 499, 513 n.55 (1991).

Finally, if the agency does not take action within the required time limits, citizens can sue to compel agency action.⁵⁴

Once an action is deemed warranted, a final proposed listing regulation is published,⁵⁵ and citizens have forty-five days to request a hearing.⁵⁶ The public has sixty days to comment on the proposed listing,⁵⁷ and the final published rule includes a review of these comments, summaries and explanations of any data used, and “a summary of factors affecting the species.”⁵⁸ The listing is to take effect no less than thirty days after the publication of the final rule, and no less than ninety days after it was formally proposed.⁵⁹

C. Lock, Stock, and Barrel: The Benefits of Getting Past the Velvet Rope

Although the listing process is somewhat broken, in the event that a species is lucky enough to make it through alive, the ESA has much to offer. It is because of the extensive protections offered these species that the ESA is so often called the “pit bull” of environmental legislation.⁶⁰ This view, of course, ignores the fact that these generous protections are exceedingly difficult to come by, resulting in a statute with far duller teeth. In any event, the protective portion of the ESA is quite powerful, which is why the listing process is so incredibly important.

⁵⁴ 16 U.S.C. § 1540(g).

⁵⁵ *Id.* § 1533(b)(3)(B).

⁵⁶ *Id.* § 1533(b)(5)(E); 50 C.F.R. § 424.16(c)(3).

⁵⁷ 50 C.F.R. § 424.16(c)(2).

⁵⁸ *Id.* § 424.18(a).

⁵⁹ *Id.* § 424.18(b)(1)-(2).

⁶⁰ See, e.g., George Cameron Coggins, *An Ivory Tower Perspective on Endangered Species Law*, 8 NAT. RESOURCES & ENV'T 3, 3 (1993); Oliver A. Houck, *The Endangered Species Act and Its Implementation by the U.S. Departments of Interior and Commerce*, 64 U. COLO. L. REV. 277, 279 (1993); Robert D. Thornton, *Searching for Consensus and Predictability: Habitat Conservation Planning Under the Endangered Species Act of 1973*, 21 ENVTL. L. 605, 605 (1991); Steven P. Quarles, *The Pit Bull Goes to School*, 15 ENVTL. F., Sept.-Oct. 1998, at 55; Timothy Egan, *Strongest U.S. Environment Law May Become Endangered Species*, N.Y. TIMES, May 26, 1992, at A11.

The first thing the agency must do upon listing a species is to designate critical habitat areas to allow that species some living space.⁶¹ The listing then “triggers the duty to prepare a recovery plan; the duty to conserve the species; the duty to consult; the duty to ensure that federal action is not likely to ‘jeopardize’ listed species or adversely modify critical habitat; and a prohibition on ‘taking’ listed species.”⁶² The following is a slightly more detailed description of the two most key protective sections of the ESA: section 7 consultation requirements and section 9 take prohibition.

First, section 7 requires all federal agencies to ensure that the actions they carry out, fund, or authorize (such as by granting permits to private individuals) are not likely to jeopardize the continued existence of any listed species or adversely modify any designated critical habitat.⁶³ This is accomplished by the action agency via formal consultation with the wildlife agency responsible for the species at issue, which is any species that may be affected by the agency action.⁶⁴ The Secretary must then issue a formal biological opinion determining whether the action is or is not likely to jeopardize the species or adversely modify the critical habitat.⁶⁵ The action agency holds the ultimate responsibility for compliance with the section and is not bound by the biological opinion in determining how to proceed.⁶⁶

Second, section 9 prohibits any person, public or private, from “taking” a listed species of fish or wildlife.⁶⁷ “Take” is a term of art, and a relatively broad one,

⁶¹ 16 U.S.C. § 1533(a)(3)(A)(i).

⁶² Laurence Michael Bogert, *That’s My Story and I’m Stickin’ to It: Is the “Best Available” Science Any Available Science Under the Endangered Species Act?*, 31 IDAHO L. REV. 85, 96 (1994) (internal citations to the statute omitted).

⁶³ 16 U.S.C. § 1536(a)(2).

⁶⁴ 50 C.F.R. § 402.14(g)(4).

⁶⁵ 16 U.S.C. § 1536(b)(3)(A). For a more detailed description of the consultation process, see [cite].

⁶⁶ *Sierra Club v. Froehlke*, 534 F.2d 1289, 1303-04 (8th Cir. 1976); 50 C.F.R. § 402.15.

⁶⁷ 16 U.S.C. § 1538(a)(1).

encompassing both direct harm to the animals and indirect harm through habitat alterations that injure the animals.⁶⁸ “Section 9 imposes extraordinarily broad liability, particularly in comparison to the laws that preceded it.”⁶⁹ Endangered species are automatically entitled to this protection via the ESA, while threatened species must be granted section 9 protection via regulations.⁷⁰ All threatened species (with limited exceptions) governed by FWS have this coverage,⁷¹ and NMFS provides it case by case to individual species.⁷²

III. DOOMED FROM THE START: HISTORY OF A FLAWED AND DAMAGED LISTING SYSTEM

After several decades with an inadequate process for listing decision-making, the ESA has developed quite a checkered history. Beginning with an unclear statutory directive, followed by immense political pressures on administrations unwilling or unable to come up with a well-organized listing plan, the candidate species backlog has continually increased. This Part reviews what is wrong, finding that the listing system was both initially flawed and then further damaged over time.

A. A Poorly Articulated Directive: Ambiguity and Excessive Discretion

The well-meaning and then-passionate goals of the ESA were ill-fated from the start. In directing the agencies to list species, the ESA uses ambiguous language, without strict definitions for the most key terms. The agencies are to list species as either “threatened” or “endangered” on the basis of the “best science available,” but none of these terms have any sort of universal meaning. Indeed, the listing requirement can

⁶⁸ *Id.* § 1532(19).

⁶⁹ Holly Doremus, *The Purposes, Effects, and Future of the Endangered Species Act’s Best Available Science Mandate*, 34 ENVTL. L. 397, 405 (2004).

⁷⁰ 16 U.S.C. § 1533(d).

⁷¹ 50 C.F.R. § 17.31 (1995).

⁷² 50 C.F.R. § 227.11 to 227.x [need to get current end cite].

barely be deemed to have an “intelligible principle,” as required to maintain its constitutionality.⁷³

1. This “Best” is Better Than What, Exactly?

“Best” is a purely relative term. It connotes no actual quality of its own, but is merely better than something else, assuming there is anything else. “Best” ... obviously does not mean good, reliable, conclusive, adequate or accurate. It means better than something worse, which could be and obviously is sometimes—bad.”⁷⁴ Courts have been reticent to analyze the meaning of this “best science” requirement, resting on the powerful combination of APA arbitrary and capricious review and Chevron deference.⁷⁵ As a result, “the listing process has become tautological: the science is adequate to support a listing decision under section 4 if the Secretary” deems it so.⁷⁶

2. How Endangered is Endangered? How Threatened is Threatened?

In determining the degree of vulnerability a species faces, there is no scientifically accepted biological definition for either “threatened” or “endangered.”⁷⁷ In everyday unscientific usage they actually have very similar meanings, which involve some kind of exposure to danger.⁷⁸ As a policy matter, these terms suggest some threshold of risk, indeed two distinct thresholds, but the ESA is silent as to where these thresholds lie.⁷⁹

⁷³ See *J.W. Hampton, Jr., & Co. v. U.S.*, 276 U.S. 394, 409 (1928) (“If Congress shall lay down by legislative act an intelligible principle to which the person or body authorized to fix such rates is directed to conform, such legislative action is not a forbidden delegation of legislative power.”).

⁷⁴ Robert E. Gordon, Jr., *When the Best Available Data is B.A.D., The Data Error Plague*, NWI Resource, Summer 1993, at 7 (expressing concern that species are wrongly listed due to bad data and citing to delistings for support of this theory).

⁷⁵ Bogert, *supra* note 62, at 140.

⁷⁶ *Id.*

⁷⁷ Kristin Carden, *Bridging the Divide: The Role of Science in Species Conservation Law*, 30 HARV. ENVTL. L. REV. 165, 200 (2006).

⁷⁸ Doremus, *supra* note 19, at 1113.

⁷⁹ *Id.*

Given that every species on earth faces some risk of extinction at some point in the future, these words are meaningless without further explanation.

Some further explanation is indeed supplied. A species is endangered if it “is in danger of extinction throughout all or a significant portion of its range,”⁸⁰ and it is threatened if it “is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.”⁸¹ Looking first at the definition of “endangered,” one can see that it suffers from the same ambiguity as the term alone—all species are in danger of becoming extinct at some point (indeed, all species *will* become extinct at some point, as surely as death and taxes). The only clarity this definition provides is the particular danger with which the term “endangered” is concerned: extinction. This is better than nothing, but not much.

The definition of “threatened” doubles this ambiguity: first it uses the term “likely” without saying *how* likely, a flaw identical to that of the term “danger,” then that likelihood is concerned with becoming “endangered,” which we already know has no set meaning. Further, the term “foreseeable” is also ambiguous. The only thing that is fairly clear, with regard to the degree of threat needed for each category, is that listed “species must face more than a de minimis threat,” and those listed as endangered “should face a greater or more immediate threat than threatened ones.”⁸²

3. That’s a Lot of Discretion

So how are the Services to determine which species to list in which category, based on what standards, and requiring how much scientific data? These are completely open questions left entirely to the agencies to decide. Given that the essential functioning

⁸⁰ 16 U.S.C. § 1532(6).

⁸¹ *Id.* § 1532(20).

⁸² Doremus, *supra* note 19, at 1117.

of the statute rests on these questions, this leaves the agencies with significant, arguably legislative, power and discretion.

Agencies are far less democratically accountable than Congress, and generally to be kept in check by the judiciary, but courts need standards against which to check the agencies' actions. Without clear direction from a statute as to exactly what methods an agency is expected to implement, the only kind of error a court can look for is that of extreme misbehavior.⁸³

B. The Fallibilities of Science In Relation to the ESA

There are some additional flaws with the statutory text relevant to this discussion, but not entirely appropriate for inclusion in the preceding subsection because ambiguity is not the source of these problems. Indeed, Congress was quite clear on this point: listing decisions are to be based *solely* on the best available science.⁸⁴ This strictly science mandate is problematic in at least two notable ways, both of which involve science's weaknesses as a policy machine. First, as many other scholars have pointed out,⁸⁵ science cannot make policy decisions, so questions which retain any elements of policy cannot be answered solely on the basis of science. Second, science is inherently uncertain, and certainty is often demanded in legal settings. The ESA lacks any direction as to how the agencies and the courts are to deal with uncertainty.

⁸³ J.B. Ruhl, *The Battle Over Endangered Species Act Methodology*, 34 ENVTL. L. 555, 579 (2004) ("The fewer methodological constraints a statute places on an agency, the less opportunity a court has to measure the agency's use of professional judgment against anything other than a test for behavior that is obviously the result of blind ambition or sheer arrogance."). See also Doremus, *supra* note 19, at 1124 ("The lack of openly-discussed standards for determining whether species are endangered, threatened, or ineligible for listing effectively leaves the agencies free to adopt virtually any decision with virtually no discussion and little fear of judicial reversal.").

⁸⁴ 16 U.S.C. § 1533(b)(1).

⁸⁵ See, e.g., Katherine Renshaw, *Leaving the Fox to Guard the Henhouse: Bringing Accountability to Consultation Under the Endangered Species Act*, 32 COLUM. J. ENVTL. L. 161, 174-75 (2007); Carden, *supra* note 77 at 202; Cary Coglianese & Gary E. Marchant, *Shifting Sands: The Limits of Science in Setting Risk Standards*, 152 U. PA. L. REV. 1255, 1257-58 (2004); Wendy E. Wagner, *The Science Charade in Toxic Risk Regulation*, 95 COLUM. L. REV. 1613, 1628 (1995).

1. Science Cannot Determine Policy

Although the language of the ESA suggests that the standards for making decisions about listing, jeopardy, etc., are to be purely scientific, analyses of ESA implementation show clearly that tradeoffs among conflicting objectives must be made in almost every instance.⁸⁶

In light of the unambiguously strict mandate, “Congress has forced agencies into a ‘science charade,’ in which they must pretend to make non-scientific decisions entirely on the basis of science.”⁸⁷ The task to which Congress has set the agencies is impossible to implement, as conservation choices cannot be made by science alone without injecting policy considerations.⁸⁸ The result is that agencies are forced to do their decision-making in private, without revealing their prohibited policy considerations, which renders their already unchecked power even less accountable. The ambiguities in the statute leave significant policy choices unmade: How much risk is our society willing to take that species will be lost forever? How many sacrifices are people willing to make to prevent this? More specifically, how endangered does a species have to be to get listed in either category? These questions have not been generally answered anywhere. They certainly cannot be answered scientifically.

Scientists have been trying to get this across as well, complaining:

“Conservationists have commonly confused the task of assessing extinction risk with that of setting priorities for conservation action. Assessing the risk of extinction is a purely biological problem,” whereas setting conservation priorities requires more subjective

⁸⁶ National Research Council, *SCIENCE AND THE ENDANGERED SPECIES ACT 134* (1995) (internal citations omitted).

⁸⁷ Doremus, *supra* note 19, at 1035 (internal citation omitted).

⁸⁸ *Id.* at 1056.

considerations.⁸⁹ As one biologist astutely pointed out, the passing of the buck to “science” has led the agencies to make these policy decisions separately for each species, which makes for very unscientific policy:

The threshold at which a species is defined as endangered, as Mark Shaffer (1981) has pointed out, is essentially a policy rather than a science decision. Such policy decisions are made on a species-by-species basis, leading to decisions of endangerment that are not equitable across species. Courts, lacking scientific knowledge and specific biological criteria with which to judge decisions, typically defer to the expertise of the implementing agency.⁹⁰

There is no serious question that policy decisions remain that go beyond the text of the ESA, yet none of the branches of government have yet attempted to deal with these choices. Absent clear criteria for determining whether a species is threatened, endangered, or neither, the agencies will continue to reinvent the values wheel for each and every listing decision. Even with the best of intentions, there is no way to achieve any consistency with this system.

2. Nothing is Certain: Deal With It

I promise nothing complete; because any human thing supposed to be complete, must for that very reason infallibly be faulty.

Herman Melville, Moby Dick

A fundamental difference between science and policy is the differing expectation of certainty. Scientists work *toward* certainty, never expecting to quite reach it, but hoping to get as close as possible to that elusive goal,⁹¹ whereas policymakers like to

⁸⁹ Holsinger, *supra* note 7, at 10. See also Timothy H. Tear, et al., *How Much is Enough? The Recurrent Problem of Setting Measurable Objectives in Conservation*, 55 BIOSCIENCE 835 (2005) (“The job of scientists is to make clear exactly what numerical objective is required to reach an associated goal. It is society’s choice to revisit and modify conservation goals in light of scientific information.”).

⁹⁰ Andrea Easter-Pilcher, *Implementing the Endangered Species Act*, 46 BIOSCIENCE 355 (1996).

⁹¹ See Dennis D. Murphy & Barry D. Noon, *Coping With Uncertainty in Wildlife Biology*, 55 J. WILDLIFE MGMT. 773, 775-76 (1991) (describing scientific knowledge as a building constantly being bombarded with data bricks that reveal its weak spots, which are reinforced before the building is then further bombarded, eventually revealing fewer and fewer weak points).

make “informed decisions” that rest on certain premises. When it comes to implementing the ESA, there will rarely be enough data to be certain regarding a species vulnerability status, yet we must move ahead with the process anyway.⁹² The agencies must decide quickly, often before they are able to gather all relevant information on even the most well-studied species, if there is to be any hope of saving those in need of our help.⁹³

The courts have also recognized this situation, requiring the agencies to move forward in spite of incomplete data, stating that they “must rely on even inconclusive or uncertain information if that is the best available at [decision] time.”⁹⁴ Indeed, simply by invoking science at all, Congress implicitly endorsed reliance on uncertain information, because “[i]t is inevitable, given the nature of science and the nature of species conservation, that agencies must often act with an incomplete understanding.”⁹⁵ It is clear that the agencies must act in spite of missing or uncertain data, but they have yet to adequately deal with the situation.

Dealing with uncertainty is no passive thing—it is not about acceptance, but rather actions that must be taken to address it. The response to uncertainty needs to move from avoidance to accommodation.⁹⁶ In order to work toward more consistent and objective decision-making, “lawmakers must understand and provide for the data gaps and uncertainties that characterize science in general, and ecosystem-based science in

⁹² Carden, *supra* note 77, at 203.

⁹³ Sasha Gennet, *New ESA Amendments: Sound Science or Political Shell Game?*, 54 BIOSCIENCE 1070 (2004) (“ESA decisions about endangered species are necessarily made before all the pertinent information on even well-studied species can be compiled.”).

⁹⁴ *Southwest Ctr. for Biological Diversity v. Norton*, 2002 WL 1733618 at *9 (D.D.C. 2002); *see also Defenders of Wildlife v. Babbitt*, 958 F. Supp. 670, 680 (D.D.C. 1997) (the ESA’s best available science mandate “require[s] far less than ‘conclusive evidence.’”).

⁹⁵ Carden, *supra* note 77, at 189.

⁹⁶ Doremus, *supra* note 19, at 1036 (“Instead of pretending that uncertainty can be avoided, we must learn how best to factor it into decisions.”).

particular.”⁹⁷ One method of actually reducing uncertainty without additional data is to set well-defined criteria. As one biologist has noted, “such a methodology would aid in reducing uncertainty and allow for more equitable and objective comparison of species by their degree of vulnerability.”⁹⁸

Not only is uncertainty acceptable in science in general, but it is especially unavoidable in environmental decision-making. Consider, for example, the fact that the ESA listing process comes with deadlines (which is by necessity as we do not have an indefinite time to make these decisions regardless of the legal limits) and requires no independent agency research to add to the existing data pool.⁹⁹ Given that the data has been so expressly limited (most of all by the time constraints), it would be unreasonable to require a certain quantity of data in order to list species, which would effectively put the brakes on the whole process.¹⁰⁰

But what of the 95% certainty expectation so often observed in scientific literature? Is that scientific, and if the scientists expect it, shouldn’t the agencies apply it in keeping with the best available science? Actually, while many peer-reviewed journals set the bar at 95% certainty for scientific conclusions, even that is an arbitrarily determined figure with no scientific basis.¹⁰¹ Moreover, the D.C. Circuit has made clear that this certainty benchmark does not apply to the world of environmental regulation:

While awaiting [95%] certainty may constitute the typical mode of scientific behavior, its appropriateness is questionable in environmental medicine, where regulators seek to prevent harm that often cannot be labeled “certain” until after it occurs. ... Where a statute is precautionary

⁹⁷ Carden, *supra* note 77, at 169.

⁹⁸ Easter-Pilcher, *supra* note 90, at 355.

⁹⁹ *Southwest Ctr. for Biological Diversity*, 2002 WL 1733618 at *9.

¹⁰⁰ See Daniel J. McGarvey & Brett Marshall, *Making Sense of Scientists and “Sound Science”: Truth and Consequences for Endangered Species in the Klamath Basin and Beyond*, 32 *ECOLOGY L.Q.* 73, 108-09 (2005).

¹⁰¹ See David S. Moore, *STATISTICS: CONCEPTS AND CONTROVERSIES* 416-18 (3d ed. 1991).

in nature, the evidence difficult to come by, uncertain, or conflicting because it is on the frontiers of scientific knowledge ... we will not demand rigorous step-by-step proof of cause and effect.¹⁰²

In sum, the strictly science mandate requires the use of uncertain data, which in turn requires the agencies to articulate a plan for how to work with uncertainty and gaps in data. This unaddressed matter and the policy decisions regarding risk aversion are both weak spots in the ESA listing scheme as it stands.

C. Turning Lemons into Lemons: The Sloppy Application of Poor Instructions

The agencies have not only failed to do anything to improve upon the mistakes of Congress in drafting the ESA, they have actively made it worse with their haphazard approach to implementing the statute. Instead of attempting to clarify the definitions of “endangered” and “threatened,” the listing regulations simply repeat the very same ambiguous language used in the statute.¹⁰³ The little additional guidance FWS provides is an apparent requirement in practice that “endangered” species be in “imminent” danger of extinction,¹⁰⁴ but it provides no elucidation of “imminent,” which thus becomes just another equally ambiguous standard.

“Not only do the agencies refuse to formulate explicit listing standards, they offer no apology for the apparent inconsistency of their decisions.”¹⁰⁵ There is little relationship between listing status and vulnerability: many unlisted species are in great danger of extinction while those species that are listed are not always the most

¹⁰² *Ethyl Corp. v. Environmental Protection Agency*, 541 F.2d 1, 25, 28 (D.C. Cir. 1976). The term “precautionary” in this quote does not likely refer to the “precautionary principle,” a philosophical approach of applying liberal environmental protections at greater economic expense in order to be extremely risk-averse. Rather, I would posit that Judge Wright is referring to statutes that are protective against future harms, and the ESA clearly is such a statute.

¹⁰³ 50 C.F.R. § 424.02(e), (m).

¹⁰⁴ *See, e.g.*, Threatened Status for the Louisiana Black Bear and Related Rules, 57 Fed. Reg. 588, 592 (1992) (“Endangered status is not chosen because the threats are not believed to place the Louisiana black bear in imminent danger of extinction.”).

¹⁰⁵ Doremus, *supra* note 19, at 1124.

vulnerable.¹⁰⁶ In addition, no standard exists even to distinguish threatened from endangered,¹⁰⁷ so the agencies are free to pick whichever they prefer, given the political climate of the moment.¹⁰⁸ The lack of correlation between listing status and risk of extinction is evidence of this.

A study that reviewed the complete history of listing decisions through 1996 found there to be no evidence of consistent standards for identifying species as endangered or threatened.¹⁰⁹ This study found that mammals were more likely to be listed than birds, reptiles, or fish, which was evident from the fact that mammals consistently had higher remaining populations than did other species in the same listing category.¹¹⁰ The study further revealed that the language used to justify listing decisions had inconsistent meanings, depending upon the type of species.¹¹¹ For example, the use of the terms “rare” and “extremely rare” did not correlate with population data.¹¹² In addition, the study revealed that there was often available biological data regarding both “historic and current distribution, population, habitat, reproductive potential, and forage and/or prey information as well as information regarding past and future impact from humans, exotics, pollution, disease, and [other] organisms,” which was not included in the final listings.¹¹³

Not only are listing decisions inconsistent, they are also intentionally delayed, taking advantage of the listing bottleneck created by the “warranted but precluded”

¹⁰⁶ Holsinger, *supra* note 7, at 10.

¹⁰⁷ Doremus, *supra* note 19, at 1123,

¹⁰⁸ See *infra* notes 119-130 and accompanying text.

¹⁰⁹ Easter-Pilcher, *supra* note 90, at 359.

¹¹⁰ *Id.*

¹¹¹ *Id.*

¹¹² *Id.*

¹¹³ *Id.* (referring to data available in the set Mammals of the World, by Nowak & Paradiso).

category in order to increase agency discretion.¹¹⁴ The category “has become a black hole for unlisted endangered species,” some of which spend decades there.¹¹⁵ Far more species enter this waiting room for the unloved than are actually listed.¹¹⁶ It is a horrible situation, but one that works quite well for the agencies, as the more species they list, the more actively involved they must become in the conservation of these species.¹¹⁷ Interior has made this very argument in objecting to increased funding for the listing process, calling listing a “lower priority activity,” that simply leads to greater funding needs for recovery, consultation, and the like.¹¹⁸

D. Plenty of Blame to Go Around: The Intense Political Pressures on the Listing Process

The significant agency discretion and complete lack of objective standards has opened the floodgates for political lobbying from interest groups of all ideological persuasions. Political pressure frequently inhibits the listing process.¹¹⁹ For the more controversial species, “citizen petitions are required to begin that process and frequently litigation is necessary to complete it.”¹²⁰ This results in most species, out of those that make it at all, reaching the list at an extremely late stage of their decline.¹²¹ And those are the lucky ones. “Faced with political opposition and threats of lawsuits from property owners and other economically interested parties, the FWS sometimes finds that the

¹¹⁴ Oliver A. Houck, *The Endangered Species Act and its Implementation by the U.S. Departments of Interior and Commerce*, 64 U. COLO. L. REV. 277, 296 (1993).

¹¹⁵ *Id.* at 286.

¹¹⁶ *Id.* at 296.

¹¹⁷ *Id.* at 293-94.

¹¹⁸ *Id.*

¹¹⁹ Doremus, *supra* note 69, at 402.

¹²⁰ *Id.*

¹²¹ *Id.* at 403.

simplest course is to avoid making the listing decision altogether.”¹²² Unfortunately there is no such thing as not making a decision, as failure to list a dying species is itself a very meaningful decision.

Repeated investigations by the General Accounting Office have consistently found that listing decisions are more politically driven than based on science.¹²³ Particularly strong evidence of this comes from a study published in 1999, which found “that public opposition and support can substantially slow and hasten, respectively, the progress of candidate species through the parts of the listing process most directly under the agency’s control.”¹²⁴ The study found that the rate of the listing process was positively affected (sped up) by either a supporting petition (direct public pressure) or the presence of a pro-environment congressperson from the region in which the species lives, while it was significantly slowed down by either direct public opposition or the presence of a pro-development congressperson from the region in which the species lives.¹²⁵ It is too bad that animals don’t know about forum-shopping! Interestingly, the study found that when there is pressure from both sides, while it can cause some initial delay (especially where opposition dominates over support), it generally results in speeding up the process, as often significant additional support jumps in once there is early opposition.¹²⁶ This may sound like a net benefit to the species; however, fair and

¹²² Barton H. Thompson, Jr., *The Endangered Species Act: A Case Study in Takings and Incentives*, 49 STAN. L. REV. 305, 312 (1997) (noting that the FWS can easily postpone the decision indefinitely by either a finding of inadequate information or a determination that listing is warranted but precluded).

¹²³ See, e.g., U.S. General Accounting Office, *Endangered Species: Factors Associated with Delayed Listing Decisions* (1993); U.S. General Accounting Office, *Endangered Species: Spotted Owl Petition Evaluation Baset by Problems* (1989); U.S. General Accounting Office, *Endangered Species: A Controversial Issue Needing Resolution* (1979).

¹²⁴ Amy Whritenour Ando, *Waiting to be Protected Under the Endangered Species Act: The Political Economy of Regulatory Delay*, 42 J.L. & Econ. 29, 29 (1999).

¹²⁵ *Id.* at 47-48.

¹²⁶ *Id.* at 50.

meaningful protection for endangered species can only come in the absence of such case-by-case political sway.

As one commentator has noted, “[e]ven relatively uncontroversial decisions seem sensitive to the agencies’ perception of the direction of the political winds.”¹²⁷ In an apparent testing of the political waters, FWS has proposed species for listing as threatened and, with no change in the data but the notable absence of opposition to the listing, went on to list the species as endangered.¹²⁸

A major problem with this politically driven system is that it heavily favors charming species over those that may be more valuable to their ecosystems (neither of which is a factor in the ESA, but at least the latter has some relationship to the ultimate goal of preserving biodiversity), and abandons the ESA’s goal of protecting all species equally on the basis of threat alone. Although they express an ethical interest in protecting biodiversity, “most Americans remain fixed on a narrow segment of the biotic community—largely vertebrate animals, particularly creatures of special historical, cultural, and aesthetic significance.”¹²⁹ This is truly as far as it gets from scientific reasoning. As the GAO noted in its 1989 report on the spotted owl fiasco, citing the high emotions and economic interests involved in listing species under the ESA, FWS “needs to be able to demonstrate that its review process and ultimate decisions have been as thorough, independent, and objective as possible.”¹³⁰ Indeed, a clear and objective

¹²⁷ Doremus, *supra* note 19, at 1125.

¹²⁸ *Id.* at 1125-26.

¹²⁹ Stephen R. Kellert, *THE VALUE OF LIFE: BIOLOGICAL DIVERSITY AND HUMAN SOCIETY* 62 (1996).

¹³⁰ U.S. General Accounting Office, *Endangered Species: Spotted Owl Petition Evaluation Beset by Problems*, at p. 2 (1989).

process is the only way out of this political quagmire. This leads to the question: how do we get there?

IV. THERE IS HOPE: SETTING QUANTITATIVE CRITERIA LEADS TO GOOD POLICY, GOOD SCIENCE, AND LESS CONFUSION

There are many great reasons to set quantitative criteria for each listing category, the most important of which are consistency, efficiency, transparency and legitimacy. It is important to note that criteria-setting is not the same thing as requiring *proof* that a species meets those criteria, for as discussed above, absolute certainty has no place in environmental regulation. Rather, criteria are set standards for species vulnerability, standards which can be met probabilistically on the basis of incomplete information, such as through modeling. Not only is it advisable to set quantitative criteria, but there is a plausible argument that this method is itself the best available science. Indeed, scientists world-wide have come together to develop the criteria used for the IUCN Red List of species at varying levels of vulnerability. After decades of study went into preparing these criteria, it would be wise for us to draw from this work—at least methodologically—in setting our own.

A. Setting Quantitative Criteria Will Improve and Legitimize the Listing Process

Proposing change in the ESA listing methodology is nothing new. That said, most advocates for change base their suggestions on what will be most likely to result in their desired outcome, whether that be fewer or more generous listings.¹³¹ Those with economic interest in reducing the number of species listed generally advocate for requiring more scientific data in order to list a species. They often rest this argument on the combination of the strictly science mandate and the traditional scientific method,

¹³¹ Ruhl, *supra* note 83, at 563 (“What I find in the battle over ESA methodology, however, is mostly rhetoric, intended to disguise efforts to shift the substantive playing field.”).

which tests a hypothesis with a strong preference for the null hypothesis (that the hypothesis is false).¹³² This simply does not work in the ESA context. “To concurrently employ both ‘purely scientific’ and ‘ESA compliant’ standards in the face of substantial uncertainty will, at times, be impossible, because the two doctrines have been fashioned to prevent different types of errors.”¹³³ Specifically, the scientific method strongly favors the null hypothesis in order to prevent false positives (called “Type I error”), while the ESA directs the agencies to list *all* species that are endangered or threatened, thus requiring avoidance of false negatives (called “Type II error”).¹³⁴ Requiring this traditional style of peer-reviewed scientific method “would render ESA decision making more like Ph.D. dissertation defenses,”¹³⁵ resulting in very poor protection for the many vulnerable species whose cases cannot be proven.

The “precautionary principle,” advocated by some environmental groups seeking to increase listings, can be equally unrealistic, depending upon the degree of precaution proposed. The approach I critique here is one which would resolve all uncertainty in favor of listing a species, even where the stronger probability suggests that the species will be fine without being listed, at least for now.¹³⁶ This involves effectively flipping the scientific method over, such that the burden of its high demand for proof is shifted in favor of listing, rather than against it—now the burden is on the opponents of listing to prove the species is secure. This method “would wreak economic havoc under the ESA

¹³² McGarvey & Marshall, *supra* note 100, at 100 (“Statistical inference does, however, confer a categorical advantage to the null hypothesis; anytime the scientist fails to accumulate sufficient proof of the alternative, she is obligated, under the tenets of peer review, to defer to the null hypothesis.”).

¹³³ *Id.* at 104.

¹³⁴ *Id.*

¹³⁵ Ruhl, *supra* note 83, at 560-61.

¹³⁶ *See id.* at 561. Sometimes the term “precautionary principle” is used to promote acceptance of uncertainty in available data (for example in the letter of 300 scientists opposing the “sound science” bills), rather than requiring high degrees of certainty in order to regulate to protect the environment. This view is in line with my immediately preceding discussion and is not here criticized.

and ... would severely reduce the statute's legitimacy from its already tenuous status.”¹³⁷

This is the last thing anybody needs, *especially* those who support the ESA's continued strength.

My proposal suffers from neither of these ailments. As a theoretical matter, setting criteria is a completely separate thing from designating the degree of evidentiary proof required to meet those criteria. As a practical matter, setting quantitative criteria tends to render the process more objective, requiring administrators to treat like cases alike through the use of “reasonably definite standards.”¹³⁸ “Striving for consistency from case to case is essential for equal justice.”¹³⁹ Setting quantitative criteria promotes fairness among species up for consideration, preventing the *ad hoc* application of the above-described philosophies. “Any federal regulatory policy must be uniform in its application, or it will be perceived as unfair.”¹⁴⁰ As the ESA is currently implemented, that is exactly how it is perceived—from both sides!

The ESA is in desperate need of increased political legitimacy, which adherence to consistent standards would provide. In a typically unscientific move, FWS developed a system that favored species according to life-form,¹⁴¹ in spite of the fact that there is no biological justification for treating vertebrates differently from invertebrates or plants.¹⁴² Congress immediately stepped in with its 1982 amendment forbidding discrimination according to life-form,¹⁴³ yet the agencies continue to treat species differently on this basis. For example, different methods of measurement are used for measuring

¹³⁷ *Id.* at 562.

¹³⁸ Kenneth Culp Davis, DISCRETIONARY JUSTICE 219 (1969).

¹³⁹ Kenneth Culp Davis, ADMINISTRATIVE LAW TREATISE 116 (2d ed. 1978).

¹⁴⁰ Emily Hartshorne Goodman, *Defining Wetlands for Regulatory Purposes: A Case Study in the Role of Science in Policymaking*, 2 BUFF. ENVTL. L.J. 135, 137 (1994).

¹⁴¹ [cite 1981 regs]

¹⁴² National Research Council, SCIENCE AND THE ENDANGERED SPECIES ACT 55 (1995).

¹⁴³ [cite amendment – I have the materials for these]

reproduction in different classes of species (such as eggs per clutch, clutches per year, young per pair, litter number, productivity), rather than a measurement that could be used across taxonomic classes, such as realized natality.¹⁴⁴

“If the agency were mandated to address a set of documented, objective, biological criteria within and across classes, and if these criteria were then made available to the scientific community, the courts, and the public, then ‘arbitrary or frivolous’ listing actions might be effectively eliminated.”¹⁴⁵ In addition to increasing fairness among classes of species, consistent standards would prevent the phenomenon of “shifting baseline syndrome,” in which species further along in their decline are met with lower expectations for population levels, and thus increase fairness among species with different levels of existing human interference.¹⁴⁶

The use of clearly defined criteria is not only more consistent, it is far more efficient than determining, for each and every species individually, what our expectations are for viability. This long drawn-out debate over each separate listing is the cause of the enormous backlog of candidate species. “Until the backlog in listing species is addressed, developers will continue to be surprised by the discovery of ‘new’ species, while environmentalists look at a mounting toll of unlisted species that have entirely disappeared.”¹⁴⁷ In addition, much time is wasted debating how to prioritize species for consideration (e.g., based on degree of threat or potential for recovery)¹⁴⁸ or on how best

¹⁴⁴ Easter-Pilcher, *supra* note 90, at 357.

¹⁴⁵ *Id.*

¹⁴⁶ See Tear, et al., *supra* note 89, at 835 (discussing this phenomenon in the context of successive generations of wildlife managers resetting the baseline according to the conditions at the start of their careers).

¹⁴⁷ Houck, *supra* note 114, at 281.

¹⁴⁸ See *id.* at 295 n.126.

to monitor the species languishing in the waiting areas,¹⁴⁹ time that could be invested in a plan to get rid of the backlog altogether. We need to find a way to get this job done and stop arguing about how to deal with the absence of this accomplishment.

Delays have not only led to this infamous backlog, but also directly affect the outcome of individual listing decisions. In Amy Ando's study, cited above for its discovery that political influences affect timing for listings,¹⁵⁰ she also found that delay was correlated with outcome.¹⁵¹ Delay made it more likely for a species to be "demoted" to a stage backward in the process,¹⁵² and less likely to be "promoted" (ever) to the next stage in the process.¹⁵³ Delay can also "enable private citizens and firms to take preemptive irreversible actions (harvesting trees, developing land) on the land that will be protected once the listing is made."¹⁵⁴ Of course, Ando also found that delay increased the likelihood that a species would go extinct while awaiting decision.¹⁵⁵ Moreover, even if a species does eventually get listed, "the longer the ESA waits to protect a species, the worse the species' chances for recovery."¹⁵⁶

There are two common arguments against setting standard listing criteria. First, there is the theory that doing so is a clear articulation of policy and thus violates the strictly science mandate. I disagree with this interpretation of the statutory text. The ESA directs the Secretary to "make determinations required by subsection (a)(1) solely on the basis of the best scientific and commercial data available to him after conducting a

¹⁴⁹ See *id.* at 296 n.129.

¹⁵⁰ See *supra* notes 124-26 and accompanying text.

¹⁵¹ Ando, *supra* note 124, at 36.

¹⁵² *Id.* at 36, 45.

¹⁵³ *Id.* at 44-45 ("The promotion hazard seems to rise to a peak around 2.5 years and taper off after that; after about 6 years there is almost no probability of being promoted.").

¹⁵⁴ *Id.* at 36.

¹⁵⁵ *Id.*

¹⁵⁶ Gennet, *supra* note 93, at 1070.

review of the status of the species”¹⁵⁷ This text refers both to the individual listing subsection and to scientific data available in relation to the review of an individual species, so the “determinations” it speaks of are clearly individual listing determinations. Since this text has been included in the ESA, there have been many policies promulgated to address general listing issues,¹⁵⁸ none of which has been struck down on the basis of the strictly science mandate.

Setting across-the-board criteria is not an individual listing determination subject to this strictly science requirement, but rather a formula in which to enter that scientific information. In fact, it is a framework that would effectively limit the individual listing considerations to those based on science, thereby increasing compliance with the strictly science mandate. As scientists regularly point out, once the criteria are set, analyzing viability against those criteria “is purely a biological problem.”¹⁵⁹ Setting quantitative criteria takes the policymaking out of the day-to-day process.

Further, endangered and threatened are ambiguous terms, thus allowing the agencies to interpret them in any reasonable fashion. This position gains powerful support from *Northwest Ecosystem Alliance v. U.S. Fish and Wildlife Service*, in which the Ninth Circuit granted *Chevron* deference¹⁶⁰ to the agencies’ joint policy setting criteria for listing distinct population segments under the ESA, noting that “Congress expressly delegated authority to the Services to develop criteria for evaluating petitions to list endangered species.”¹⁶¹ Thus, setting quantitative criteria would not violate the

¹⁵⁷ 16 U.S.C. § 1533(b)(1)(A).

¹⁵⁸ 50 C.F.R. 424.11.

¹⁵⁹ Holsinger, *supra* note 7, at 10; *see also* Eric W. Sanderson, *How Many Animals Do We Want to Save? The Many Ways of Setting Population Target Levels for Conservation*, 56 *BIOSCIENCE* 911 (2006); Tear, et al., *supra* note 89, at 835.

¹⁶⁰ *Chevron v. Natural Res. Def. Council*, 467 U.S. 837 (1984).

¹⁶¹ *Nw. Ecosystem Alliance v. U.S. Fish and Wildlife Serv.*, 475 F.3d 1136, 1141 (9th Cir. 2007).

strictly science mandate; rather, it would simply be an interpretive step necessary to implement the statute. Once that interpretive step has been taken, it will become far easier to abide by the strictly science mandate in individual listings.

The second argument, which has been raised by FWS among others, is that a “one-size-fits-all” approach is incompatible with science because different species function differently.¹⁶² As I will discuss in greater detail in the subsection on IUCN criteria, much of this difficulty can be resolved by setting a variety of criteria that apply according to life-cycles of species, and which encompass the varying ways species begin to exhibit decline. Further, if there remains concern regarding this issue, even after attempting to catch the differences when setting the criteria, there is always room for some flexibility. For example, we could treat the criteria as guidelines that must be followed most of the time, and require strict procedures for explaining any deviation from them. This way, outliers could be addressed, but the haphazard approach we have now would be strongly discouraged by the difficulty of making exceptions.

For an excellent example of how well this can work, we need look no further than Florida, the state that has been the most willing to embrace the setting of quantitative objectives for wildlife conservation.¹⁶³ “The Florida Forever Act of 1999 explicitly recognizes that measurable goals are central to successful conservation programs.”¹⁶⁴ Florida used a series of population viability analyses to determine its criteria for selecting areas of land for conservation.¹⁶⁵ Then, when this preset criteria led to the discovery that massive areas of land were needed to meet the objectives, the plans were able to survive

¹⁶² See Kevin Eldridge, *Whale for Sale?: New Developments in the Convention on International Trade in Endangered Species of Wild Fauna and Flora*, 24 GA. J. INT'L & COMP. L. 549, 561 n.62 (1995).

¹⁶³ Tear, et al., *supra* note 89, at 840.

¹⁶⁴ *Id.*

¹⁶⁵ *Id.*

against the public outcry that ensued.¹⁶⁶ Thanks to a solid foundation, “the objectives remained intact because of the defensibility of the process, independent of perceived feasibility.”¹⁶⁷

Finally, setting quantitative criteria would meet several implicit goals Congress suggested via the ESA’s best available science mandate. Professor Holly Doremus provides the following list of purposes most likely served by the mandate:

First, it could promote substantively more accurate decisions in a context where the legislature could readily conclude that science dominates decision-making needs. Second, it might increase public trust and build political credibility by encouraging the polity to believe that decisions are objectively determined by the evidence, rather than chosen arbitrarily or to serve the particular values of the decision maker. ... Third, it could affect judicial review of agency decisions, either protecting those decisions from close examination by invoking special deference to agency expertise or inviting more stringent review by providing the courts with an additional standard to enforce.¹⁶⁸

Each of these potential purposes is best served by setting objective quantitative criteria.

First, it would result in listings that were more accurate across the board by eliminating the many confounding factors discussed above. Second, it would remove the subjectivity that eats away at public trust. Third, it would significantly strengthen judicial review by providing clear standards for that review. The Supreme Court has held that the best available science standard’s “obvious purpose ... is to ensure that the ESA not be implemented haphazardly, on the basis of speculation or surmise.”¹⁶⁹

¹⁶⁶ *Id.*

¹⁶⁷ *Id.*

¹⁶⁸ Doremus, *supra* note 69, at 418 (noting that “[t]here is no direct legislative history explaining the ESA’s best available science mandate.”). The list included a fourth possible purpose, not applicable here: “Fourth, it could alter the decision-making process in ways that might be important (to fans or foes of regulation) either for their own sake or because they make a difference in the substance of the ultimate decisions.” *Id.*

¹⁶⁹ *Bennett v. Spear*, 520 U.S. 154, 176 (1997).

B. Quantitative Criteria IS the Best Available Science

*The classification of the constituents of chaos, nothing less is here
essayed. Listen to what the best and latest authorities have laid down.*
Herman Melville, *Moby Dick*

Not only would setting quantitative criteria aid in attaining the goals underlying the best available science mandate, this sort of criteria arguably *is* the best available science. Indeed, while this Article is the first in the law review context to focus on the proposal of setting quantitative criteria for ESA listing, the argument is found throughout the scientific literature.¹⁷⁰ It is time for the lawyers and politicians to seek a meeting of the minds with the biologists on this incredibly important regulatory matter.

We hear a lot about the “sound science” movement, which has led to a number of bills proposing tougher scientific-method-like requirements for the scientific data that is needed to *list* a species (but, of course, not to deny listing).¹⁷¹ As already discussed, such scientific methods are based upon principles inapplicable to the ESA context and require data that rarely exists, and thus are not “sound” for use in the listing process.¹⁷² The scientists know better—more than 300 of them, including prominent members of the National Academy of Sciences, signed a letter to Congress opposing the “sound science” bills, noting that they would exclude the most sound science for the ESA context: population viability analysis and modeling.¹⁷³ Discussing this letter with the press, Dr.

¹⁷⁰ Leah R. Gerber & Lelia T. Hatch, *Are We Recovering? An Evaluation of Recovery Criteria Under the U.S. Endangered Species Act*, ECOLOGICAL SOC. OF AMERICA Vol. 12 No. 3 668, 669 (June 2008); Michael K. Young & Amy L. Harig, *A Critique of the Recovery of Greenback Cutthroat Trout*, CONSERVATION BIOLOGY Vol. 15 No. 6 1575, 1578 (Dec. 2001); Leah R. Gerber & Douglas P. DeMaster, *A Quantitative Approach to Endangered Species Act Classifications of Long-Lived Vertebrates: Application to the North Pacific Humpback Whale*, CONSERVATION BIOLOGY Vol. 13 No. 5 1203, 1204 (Oct. 1999).

¹⁷¹ [cite bills]

¹⁷² See generally McGarvey & Marshall, *supra* note 100.

¹⁷³ Ellen Paul, *Science: The Newest Political Football in the Endangered Species Game*, 52 BIOSCIENCE 792 (2002); see also Cat Lazaroff, *Species Protection Law Key to Grizzly Survival*,

David Blockstein, a leading conservation biologist, stated that the “scientific methodologies [must be] defined and managed by scientists, [or] they have no credibility.”¹⁷⁴ Fortunately, scientists have collaborated on an excellent methodology for endangered species identification, which I discuss below in the section on IUCN criteria.

“[S]cientists understand that sound science is more of a process than an end point.”¹⁷⁵ Science is not just a set of data, or even the interpretations of that data, but is also procedural, in that it is itself about process.¹⁷⁶ There is no single universal scientific method, but rather various methodologies which apply themselves to varying contexts. Scientists define “sound science” differently than politicians do for the ESA context: “The documented, systematic consideration of a set of well-defined variables and categories within them is a necessary first step in the development of a sound, scientific methodology for making determinations of endangerment.”¹⁷⁷

In Andrea Easter-Pilcher’s study,¹⁷⁸ she found that existing listings reflect a significant lack of data and instead rest primarily on general description.¹⁷⁹ Setting quantitative criteria would be an excellent way to work with a lack of data. As she notes, “this lack does not preclude systematic consideration of a set of better-defined variables and categories within them.”¹⁸⁰ Indeed, this would be a significantly better way to deal with otherwise insufficient data:

Environment News Service, July 23, 2002, available at <http://www.ens-newswire.com/ens/jul2002/2002-07-23-06.asp>.

¹⁷⁴ *Id.*

¹⁷⁵ McGarvey & Marshall, *supra* note 100, at 75.

¹⁷⁶ Doremus, *supra* note 19, at 1057-58.

¹⁷⁷ Easter-Pilcher, *supra* note 90, at 359.

¹⁷⁸ See *supra* notes 109-113 and accompanying text (discussing her study’s findings regarding FWS listing mammals more easily than other species).

¹⁷⁹ Easter-Pilcher, *supra* note 90, at 357.

¹⁸⁰ *Id.*

The potential use of data-hungry techniques such as population viability analysis fades in light of the high levels of missing data reported in this study. However, it is possible that by consistently addressing definitive biological criteria a computerized ranking algorithm such as classification and regression trees may be developed and used to evaluate, compare, and rank the status of different species.¹⁸¹

While we cannot cure the inevitable defect of information gaps, we can certainly learn to compare the data that we do have in a consistent manner, allowing us to gain a better understanding of how our limited data does inform us. Setting quantitative criteria is the best way to accomplish this.

C. The Scientist-Developed IUCN Listing Criteria: America's Next Top Model?

Now for the best news of all: much of the work required to set up this more objective process has already been done. The International Union for the Conservation of Nature (IUCN) is an international non-governmental organization whose mission is to provide scientific expertise free of political influence to aid conservation programs worldwide.¹⁸² It initially formed in 1948 and released its first Red Data Book (listing species by degree of vulnerability) in 1960.¹⁸³ The IUCN's most current "Red List Categories and Criteria," which sets out clear quantitative criteria for identifying varying threat levels, were created over the course of more than a decade of collaboration and revision by scientists from around the world.¹⁸⁴ I propose that we use these criteria as a model for setting new ESA listing criteria, ideally enlisting the aid and support of scientists from the IUCN.

¹⁸¹ *Id.* (internal citation omitted).

¹⁸² See Robert Boardman, INTERNATIONAL ORGANIZATION AND THE CONSERVATION OF NATURE 42, 47, 74-75 (1981).

¹⁸³ *Id.* at 47, 55.

¹⁸⁴ IUCN Red List Categories and Criteria, version 3.1 (2001) [hereinafter "IUCN Criteria"] at 2-3.

In drafting the early endangered species statutes, both houses of Congress specifically suggested that reference to the IUCN's Red Book "should be especially valuable in identifying" species worthy of being listed under U.S. legislation.¹⁸⁵ They also recommended direct consultation with the IUCN as a step in the listing process.¹⁸⁶ Application of the IUCN Criteria would put us in good company, as the current criteria "have become widely recognized internationally," and are currently applied "by numerous governmental and non-governmental organizations."¹⁸⁷ Perhaps most notable is the 1994 adoption of IUCN-devised criteria for use in the primary international treaty to protect endangered species, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).¹⁸⁸ The new CITES criteria have been described as "the most objective standards in endangered species listing being used in the world,"¹⁸⁹ and after the adoption of these criteria for use in CITES, "the process of listing species became clearer and firmer."¹⁹⁰

The IUCN articulates four goals behind its new Criteria:

- to provide a system that can be applied consistently by different people;
- to improve objectivity by providing users with clear guidance on how to evaluate different factors which affect the risk of extinction;
- to provide a system which will facilitate comparisons across widely different taxa;

¹⁸⁵ S. Rep. No. 91-526, at 5; H.R. Rep. No. 91-382, at 6.

¹⁸⁶ *Id.*

¹⁸⁷ IUCN Criteria, *supra* note 184, at 1.

¹⁸⁸ CITES, Mar. 3, 1973, 27 U.S.T. 1087, 993 U.N.T.S. 243.

¹⁸⁹ Shawn M. Dansky, *The CITES "Objective" Listing Criteria: Are They "Objective" Enough to Protect the African Elephant?*, 73 TUL. L. REV. 961, 979 (1999) (criticizing the criteria for being "not completely objective, as they still allow Parties to take into consideration range-states' economic and social problems). Due to the ESA's prohibition on such considerations, the weakness complained of here would not exist in our criteria.

¹⁹⁰ Scott Hitch, *Losing the Elephant Wars: CITES and the "Ivory Ban"*, 27 GA. J. INT'L & COMP. L. 167, 179 (1998).

- to give people using threatened species lists a better understanding of how individual species were classified.¹⁹¹

If one were to write a wish list of what is most desperately needed in order to reform the ESA listing process, these achievements would top that list, leaving only the question as to how well the Criteria are suited to those goals. Given the “[e]xtensive consultation and testing” that went into developing the Criteria,¹⁹² they are at a minimum better qualified to attain those goals than anything else we’ve got.

The IUCN Criteria set out nine categories into which all species somewhere fall: Extinct, Extinct in the Wild, Critically Endangered, Endangered, Vulnerable, Near Threatened, Least Concern, Data Deficient, and Not Evaluated.¹⁹³ Species that fall into the three categories from Vulnerable through Critically Endangered are generally referred to as Threatened,¹⁹⁴ and are the sort of species on which the ESA focuses. The five criteria used for each of these three categories function very similarly, distinguishable primarily by the actual numbers they set. These five criteria were designed to collectively address the viability indicia of all taxa, so for any given species one criterion will be more applicable than another.¹⁹⁵ For this reason, each species is to be evaluated against all criteria, but need meet only one criterion in order to be listed at that level.¹⁹⁶

The first criterion is based on a reduction in population, with varying percentages depending upon the cause and time-frame at issue, which I will lay out in more detail than the other criteria. For a population reduction over the last ten years or three

¹⁹¹ IUCN Criteria, *supra* note 184, at 1.

¹⁹² *Id.*

¹⁹³ *Id.* at 14-15.

¹⁹⁴ *Id.* at 5.

¹⁹⁵ *Id.* This is also a powerful response to the most common argument made against setting standardized criteria, that it is not biologically sound to use a “one-size-fits-all” approach, revealing that argument to be a pretext for holding onto the great discretion the agencies now enjoy.

¹⁹⁶ *Id.* at 5, 16-23.

generations (whichever is longer), but for which the cause has been discovered and ceased and is reversible, we look for a 90% reduction for Critically Endangered, a 70% reduction for Endangered, and a 50% reduction for Vulnerable.¹⁹⁷ For that same time period, but where the cause has not ceased or may not be reversible, we look for an 80% reduction for Critically Endangered, a 50% reduction for Endangered, and a 30% reduction for Vulnerable.¹⁹⁸ If we are projecting into the future for the same period of time, we look for these same latter percentages, and likewise for a period of that length which is presently underway (part past, part future).¹⁹⁹

The second criterion sets quantitative figures for geographic range, dealing both with extent of occurrence and area of occupancy.²⁰⁰ The third criterion considers total population size in conjunction with decline and/or fluctuations.²⁰¹ The fourth criterion simply looks at population size, without requiring decline or fluctuation, and thus sets the population figures for each category significantly lower than those in the third criterion.²⁰² The fifth and final criterion is pure population viability analysis, requiring a probability of extinction in the wild within varying lengths of time/generations and at varying percentages, depending upon the category.²⁰³ Although all five criteria are divided into three categories of vulnerability, it would be possible, ideally through consultation with the IUCN, to structure the criteria around the ESA's threatened and endangered categories.

¹⁹⁷ *Id.* at 16-23.

¹⁹⁸ *Id.*

¹⁹⁹ *Id.*

²⁰⁰ *Id.*

²⁰¹ *Id.*

²⁰² *Id.*

²⁰³ *Id.*

The IUCN Criteria were built on the cutting edge of developments in population viability analysis, have stood up well for over a decade, and “represent a significant advance over other systems.”²⁰⁴ If the Services refuse to consider using this type of quantitative criteria for listing endangered and threatened species under the ESA, Congress should direct them to do so, as the current reach of agency discretion is too great. If neither branch makes any effort to move in this direction, the public deserves an explanation as to why the best scientific developments are not being utilized.

V. WHICH BRANCH MIGHT HAVE THE MOST SWAY?

In light of the importance—and the future of biodiversity in the U.S. may well depend upon it—of making a move toward the use of quantitative criteria in the ESA listing process, it is worthwhile here to consider the various avenues for doing so. Indeed, there is at least some potential in all three branches of government, though the balance of pros and cons greatly varies among them and this potential is most heavily concentrated in the legislative and executive branches. Given the difficulty in locating individuals with the motivation to use their constitutional authority for this cause, let us consider each avenue with an open mind, as the best or most obvious one may not be available.

A. The Regulatory Approach

The most obvious—and likely the easiest—path to improving the listing process would be rulemaking within the very agencies that must thereafter implement it. Given that this is an election year, we will soon have a new administration, so anything is possible. Indeed, the Clinton administration defended the ESA from attacks by a

²⁰⁴ Holsinger, *supra* note 7, at 10.

Republican Congress,²⁰⁵ and we might soon find ourselves with another pro-environment administration, possibly even more so.

There are many reasons why administrative regulation is likely the best way to design the much-needed quantitative criteria for listing endangered and threatened species. First, the rulemaking process would allow for diverse public comment, both with regard to the policy choices involved in setting the numerical thresholds and also as to the scientific community's views on the criteria design itself. Second, administrative rules could adapt more easily than legislation could as scientific knowledge develops and as we see how the first set of criteria work in practice. Third, setting the criteria may be too politically difficult for a split Congress, whereas the agencies can more easily work together on the process. Finally, taking this step could help the agencies to rehabilitate their tainted image after decades of unscientific listing decisions, as well as allow them to escape from under the intense political pressures weighing down the listing process.

There are also disadvantages to getting this done at the administrative level, though they are likely outweighed by the advantages. First, the agencies lack the ability to adjust their own funding as may be required in order to achieve more comprehensive listing reform, which would be a desirable approach. That said, this would not affect their ability to set quantitative criteria, which is the most valuable step in the reform. Perhaps the stickier issues would relate to limits on agency authority. Not only do some argue that setting listing thresholds would violate the ESA's strictly science mandate,²⁰⁶

²⁰⁵ Holly Doremus & Dan A. Tarlock, *Fish, Farms, and the Clash of Cultures in the Klamath Basin*, 30 *ECOLOGY L.Q.* 279, 282 (2003).

²⁰⁶ See *supra* notes 157-61 and accompanying text for the arguments against this position.

but doing so could also raise some concerns regarding whether Congress' leaving this step to the agencies was an excessive delegation of legislative power.²⁰⁷

B. Statutory Amendment by Congress

Congressional amendment would allow for more comprehensive reform of the listing process. In addition to addressing the need for quantitative criteria, Congress could also require some amount of data-gathering in cases where there is insufficient data to evaluate a species against those criteria, and could fund that mandate.²⁰⁸ If Congress were to take a stab at setting the criteria, it could depart from the existing endangered/threatened pair and split species into more categories (more akin to the IUCN criteria), which the agencies cannot do. This would also avoid the questions of delegation and otherwise questionable agency authority, but could raise problems with lack of adaptability and possibly inadequate public input on the details. In light of these problems, along with the political gridlock Congress tends to experience in dealing with the ESA, it might be wise for Congress to merely direct the agencies to set quantitative criteria, providing them with an intelligible principle for doing so. This would avoid the need to make the biggest policy decision, which is where exactly to set the thresholds. It would also resolve the questions regarding agency authority to set the criteria. Indeed, if the agencies do not act on this need soon, Congress should take this step.

C. Pressure from the Courts

²⁰⁷ See generally David M. Wagner, *American Trucking: The "New Nondelegation Doctrine" is Dead (Long Live the Old One?)*, 11 U. BALT. J. ENVTL. L. 25 (2003) (arguing that the *American Trucking* case may have actually breathed new life into the nondelegation doctrine by eliminating both the spectrum approach to considering delegations and the potential for agencies to cure the defect).

²⁰⁸ Although such studies could delay the listing process for those species, given that it would only be applicable in cases of insufficient data (which generally result in no listing at all), this would likely be harmless.

Finally, courts may begin to push for better criteria, especially when judges are made aware of the IUCN criteria. This is the longest-shot yet discussed here, but one federal court has already struck down a Fish & Wildlife Service interpretation of “foreseeable future” in the definition of “threatened” because it strayed too far from the IUCN’s criteria without explaining that departure.²⁰⁹ This could certainly turn out to be an isolated incident, but if attorneys continue to argue the point, it may well become a wider trend.

VI. CONCLUSION

We live in a time of rapidly increasing environmental awareness. While it is no new concept that everything is connected, such that harming one thing can harm others whose relationship is not readily apparent, it is a concept that is spreading more than ever in the face of global warming and extraordinary rates of extinction. These issues have led to widespread concern, so our new administration should take heed. Not only do we need to maintain thriving ecosystems at home, but the U.S. is a relevant player in worldwide biodiversity, so we have a duty to implement our primary biodiversity statute effectively. Setting appropriate quantitative criteria for listing species is perhaps the single most important step in this direction.

²⁰⁹ See *Western Watersheds Project v. Foss*, 2005 WL 2002473 (D. Idaho, 2005) (“Furthermore, other agencies and organizations, have designated much lower extinction risk within 100 years as qualifying a species for a ‘threatened’ status. For example, in this case, the FWS rejected the timeframes suggested by the International Union for the Conservation of Nature (‘IUCN’), which places a 10% extinction risk within 100 years as falling within the definition of ‘threatened.’ In fact, in its own notes, the FWS acknowledged that its definition of ‘foreseeable future’ and ‘threatened’ differed from that of IUCN and observed that it would have to explain why it used a different standard. The Court could not glean from the expansive administrative record where the FWS explained this deviation from IUCN guidelines for extinction risk.”) (internal citations to administrative record omitted).