

DEFINING THE “NATURE” PROTECTED BY THE ENDANGERED SPECIES ACT: LESSONS FROM HATCHERY SALMON

ANDREW LONG*

TABLE OF CONTENTS

Introduction	421
I. The Endangered Species Act and the Context of Pacific Salmon Decisions	423
A. Background on the ESA.....	423
B. Salmon Count: History and Significance of Salmon Declines and Artificial Propagation.....	426
C. Defining Salmon Populations for Assessing Viability Under the ESA	433
II. Hatchery-Bred Salmon Under the ESA: Framing the Issue ..	435
A. The Ambiguous Status of Hatchery-Bred Salmon: Statutory Language and Legislative History	435
B. Interim Policy Delineating the Relationship Between Wild and Hatchery Salmon.....	440
C. Public Support and Opposition for Salmon Protection	442
D. <i>Alsea Valley Alliance v. Evans</i>	443
II. Resolving the Hatchery Question: Debate and Agency Action in Response to <i>Alsea</i>	447
A. NMFS’s Initial Proposals.....	447
1. Plan to Protect Self-Sustaining Populations.....	447
2. A Plan to Count Artificially-Propagated Fish in Listing Determinations	448

* Visiting Assistant Professor of Law, University of Louisville Louis D. Brandeis School of Law (2007–2008). I thank Richard Stewart for his continuing encouragement and inspiration in the development of this Article. I am also very grateful to Holly Doremus, Marc Poirier, Michael Blumm, Jonathan Nash, Norman Williams, William Nelson, Eric Christensen, Rónán Kennedy, Amanda Garcia, Gordon Lyon, Erik Goergen, and Anthony Belsito for their comments on earlier drafts, as well as Dale Jamieson for research suggestions. Finally, I appreciate the tireless efforts of the *New York University Environmental Law Journal* editors in bringing this Article to print.

2007]	<i>ESA: LESSONS FROM HATCHERY SALMON</i>	421
B.	“Science” and “Nature” as Rhetorical Tools.....	450
1.	Efforts to Hide Policy Behind Science	450
2.	The Crux of the Issue: A Conflict of Values	455
C.	The New Hatchery Policy	459
1.	Final Policy	460
2.	Impact of the Final Policy	462
D.	Political Responses.....	465
E.	Trout Unlimited v. Lohn	467
F.	Other Problems with the 2005 Policy	470
IV.	Significance and Lessons of the Case Study	472
A.	Broader Significance of the Issues Raised by Hatchery Salmon 473	
B.	The Ethics of Protecting Wild Fish: The Need for a Policy Preserving Self-Sustaining Populations	476
1.	Intrinsic Value in Species and Ecosystems	478
2.	Additional Rationales: Intergenerational Equity and Avoiding Unnecessary Harm.....	480
C.	Defending an Ethical Choice and Defining the Role of Science 482	
1.	The Value of Explicitly Recognizing a Clear Policy Favoring Self-Sustaining Species	482
2.	Understanding the Interplay of Biodiversity Policy Goals, Economics, and Science	483
V.	Incorporating Protection of Self-Sustaining Species	485
A.	A Proposal for Congressional Action	486
B.	An Administrative Proposal.....	488
C.	Appellate Review	490
VI.	Conclusion.....	491

INTRODUCTION

What components of “nature” does the Endangered Species Act (ESA) seek to protect? Recognizing that the ESA seeks to protect “species” begs the questions of what qualifies as a species and whether the species must be able to survive without continual human aid. Addressing these deceptively simple questions requires both looking at a context in which the ESA applies and considering ethical issues that affect biodiversity law in general. The first administrative guidance on defining the “species” protected by the ESA in a particular context involved Pacific salmon. These fish present one of the thorniest examples of

difficulty in defining the object of ESA protection, which makes them an excellent case study for understanding which components of the natural world the ESA aims to protect. The case study and the broader ethical implications arising from it provide lessons for improving future ESA implementation.

The issue that frames the case study in this Article is whether hatchery-bred salmon are the full equivalent of naturally-reproducing salmon for purposes of assessing the species' viability. The issue carries great importance for the Pacific Northwest, as similar issues do for regions throughout the country. Indeed, salmon decisions are but one of numerous contexts in which implementation of the ESA has raised fundamental questions concerning what groupings should qualify as a species under the statute, the broader aim of the statute, and the shape of biodiversity policy more generally. For species as diverse as the Florida panther and the western cutthroat trout, the agencies implementing the ESA have faced questions akin to the challenge of defining the relationship of wild and hatchery salmon. Their responses have been inconsistent, generating extensive litigation and agency review. This Article aims to explain the problem, define the components of the natural world that the law should aim to protect, and offer suggestions for incorporating this understanding into the existing statutory structure.

Part I provides general background on the ESA and an overview of Pacific salmon, including their decline, relevant scientific information, and the role of hatcheries. Part II discusses the ESA's definition of "species" and details its application to salmon through 2001. Part III relates the administrative history and public debate triggered by a 2001 district court decision undermining National Marine Fisheries Service's (NMFS) policy concerning hatchery-bred salmon, including the rhetoric that frequently misrepresented the limits of science and demonstrated the malleability of "nature" concepts. Part IV highlights other contexts to which the question of what is "natural" is relevant and establishes an ethical rationale for defining "natural" species in the law on the basis of both their ability to remain viable without dependence upon consistent human intervention and the degree to which human intervention has altered their genetic, behavioral, and morphological trajectories. Part V offers a concrete proposal for congressional action to provide a clear standard for employing this definition, an alternative proposal for agency action, and an

assessment of the potential for clarifying the ESA's application through judicial review. Part VI concludes.

I. THE ENDANGERED SPECIES ACT AND THE CONTEXT OF PACIFIC SALMON DECISIONS

A. *Background on the ESA*

The conservation mechanisms of the ESA attach to a list of protected species. Accordingly, the threshold consideration of whether to list a species functions as the “keystone” of the ESA.¹ Section 4 of the ESA requires that the agencies (NMFS for marine and anadromous species, including salmon, and the Fish and Wildlife Service (FWS) for all others) list all species that are determined by them to be “threatened” or “endangered” due to virtually any natural or man-made factor.² The agencies may list a species on their own initiative or, as is much more common in recent years, following consideration of a citizen petition to list.³ Listing decisions carry extensive consequences and, therefore, frequently generate litigation.⁴ Currently, more than 1300 species are listed as either threatened or endangered in the United States.⁵ Approximately 300 other species are proposed for listing or are

¹ J.B. Ruhl, *Section 4 of the ESA: The Keystone of Species Protection Law*, in *ENDANGERED SPECIES ACT: LAW, POLICY, AND PERSPECTIVES* 19 (Donald C. Baur & Wm. Robert Irvin eds., 2002).

² 16 U.S.C. § 1533(a)(1), (c)(1) (2000). An “endangered species” is “any species which is in danger of extinction throughout all or a significant portion of its range.” *Id.* § 1532(6). A “threatened species” is one “likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” *Id.* § 1532(20); see also U.S. FISH & WILDLIFE SERV., *ESA BASICS: 30 YEARS OF PROTECTING ENDANGERED SPECIES* 1 (2006), available at http://www.fws.gov/endangered/pubs/ESA%20BASICS_050806.pdf.

³ 16 U.S.C. § 1533(b)(3)(A) (2000). For example, a 2000 study found that ninety-two percent of listings in the state of California since 1992 were the result of citizen petitions. KIERAN SUCKLING, *NO ROOM ON THE ARK? ENDANGERED SPECIES LISTING TRENDS IN CALIFORNIA 1974–2000* (2000), available at <http://www.biologicaldiversity.org/swcbd/activist/ESA/ark2.html>.

⁴ See, e.g., Holly Doremus, *Science Plays Defense: Natural Resource Management in the Bush Administration*, 32 *ECOLOGY L.Q.* 249, 268–69 (2005) (“Every one of the tiny number of listing rules finalized in the last two years has been driven by litigation.”) [hereinafter Doremus, *Science Plays Defense*].

⁵ U.S. Fish & Wildlife Serv., *USFWS Threatened and Endangered Species System (TESS), Summary of Listed Species*, http://ecos.fws.gov/tess_public/Boxscore.do (last visited Mar. 30, 2007).

listing candidates.⁶

For listing determinations, the ESA states that the agencies “must make determinations . . . *solely* on the basis of the best scientific . . . data available.”⁷ This “best available science mandate” contrasts with other decisions required under the ESA, in which the agencies must take account of several factors, such as “economic impact.”⁸ Although the language leaves room for debate over whether this “science only” requirement applies to the determination of what groupings may be considered for listing, the agencies generally act as though it does.⁹

Congress enacted the ESA for the explicit purpose of conserving both endangered and threatened species and “the

⁶ U.S. Fish & Wildlife Serv., USFWS Threatened and Endangered Species System (TESS), http://ecos.fws.gov/tess_public (follow links for “Species Proposed for Listing” and “Candidate Species”) (last visited Apr. 4, 2007).

⁷ 16 U.S.C. § 1533(b)(1)(A) (2000) (emphasis added). Congress limited considerations to “*solely*” the “best available science” in 1982, along with deadlines for listing determinations, in order to break the regulatory deadlock created by the Reagan administration’s requirement of economic impact analysis of listing decisions. See Holly Doremus, *Listing Decisions Under the Endangered Species Act: Why Better Science Isn’t Always Better Policy*, 75 WASH. U. L.Q. 1029, 1054–55 (1997) [hereinafter Doremus, *Listing*]; see also Holly Doremus, *The Purposes, Effects, and Future of the Endangered Species Act’s Best Available Science Mandate*, 34 ENVTL. L. 397 (2004) [hereinafter Doremus, *Science Mandate*]. Ironically, many who would like to slow the listing process are now urging increased scientific rigor as a means of making the listing process more difficult. See, e.g., J.B. Ruhl, *The Battle Over Endangered Species Act Methodology*, 34 ENVTL. L. 555, 589–90 (2004). The phrase “commercial data,” omitted from the quotation in the text here, refers to data regarding the impact of commercial activities on species. See, e.g., Doremus, *Listing, supra*, at 1043.

⁸ E.g., 16 U.S.C. § 1533(b)(2) (2000) (providing the basis for designation of critical habitat).

⁹ The legislative history of the 1982 amendments to the ESA, which added the word “*solely*” to section 1533(b)(1), suggests that the decision must be made based on science alone. H.R. REP. NO. 97-835, at 19 (1982) (Conf. Rep.). The conference report stated that the amendments were intended to “ensure that decisions in every phase of the process pertaining to the listing or delisting of species are based solely upon biological criteria and to prevent non-biological considerations from affecting such decisions.” *Id.*; see also Doremus, *Listing, supra* note 7, at 1095–97 (arguing that the science only requirement does apply). An example of the agencies suggesting a connection can be found in the Federal Register notice for the Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act, 61 Fed. Reg. 4721, 4722 (Feb. 7, 1996) (“It is important in light of the Act’s requirement to use the best available scientific information in determining the status of species that this interpretation follows sound biological principles.”).

ecosystems on which [they] depend.”¹⁰ Although the purposes of the statute are explicit, the theory according to which it should be understood is not clear. In one sense, the ESA is the least anthropocentric statute in U.S. law because it compels protection of other species even where their demise may not harm humans. While an anthropocentric defense of the ESA is possible,¹¹ looking more carefully at potential ethical rationales for the ESA leads to less certainty.¹² Indeed, even if Congress had a general moral reason for enacting the ESA, the myriad situations in which it applies would likely require refining the underlying theory to explain the statute’s implementation.

Whatever its underlying rationale, the ESA contains a strict mandate that has made it a focal point for criticism of environmental law.¹³ In regard to a listed species, the statute includes two core provisions designed to effectuate its protective goals. Section 7 requires that all federal agencies consult with the wildlife agencies to ensure that action they engage in, fund, or authorize does not “jeopardize” any listed species.¹⁴ Section 9 prohibits the “take” of endangered species by any person, except

¹⁰ 16 U.S.C. § 1531(b) (2000) (“The purposes of this chapter are to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved [and] to provide a program for the conservation of such endangered species and threatened species . . .”).

¹¹ See, e.g., Joe Mann, Note, *Making Sense of the Endangered Species Act: A Human-Centered Justification*, 7 N.Y.U. ENVTL. L.J. 246 (1999).

¹² James L. Huffman, *Do Species and Nature Have Rights?*, 13 PUB. LAND L. REV. 51 (1992) (suggesting Congress did not enact the ESA as an expression of ethical theory, then evaluating several ethical theories and concluding none comport very well with the ESA); Holly Doremus, *Restoring Endangered Species: The Importance of Being Wild*, 23 HARV. ENVTL. L. REV. 1, 13–14 (1999) (finding that a moral obligation to protect species underlies the ESA, but “[t]he exact nature of the ethical duty embodied in the Act . . . has proved difficult to pin down”) [hereinafter Doremus, *Wild*]; see also Alyson C. Flournoy, *In Search of an Environmental Ethic*, 28 COLUM. J. ENVTL. L. 63, 97–101 (2003) (calling for greater analysis of the ethical underpinnings of environmental law and citing the ESA as a prime example); Andrew E. Wetzler, Note, *The Ethical Underpinnings of the Endangered Species Act*, 13 VA. ENVTL. L.J. 145, 148 (1993) (calling for greater incorporation of ethical considerations in ESA decision-making). For a more general discussion of ethics in endangered species protection, see, e.g., Holmes Rolston III, *Biodiversity*, in A COMPANION TO ENVIRONMENTAL ETHICS 402 (Dale Jamieson ed., 2001).

¹³ See, e.g., MICHAEL E. KRAFT, ENVIRONMENTAL POLICY AND POLITICS 172 (2d ed. 2001).

¹⁴ 16 U.S.C. § 1536(a)(2) (2000). Such activities include timber harvesting in National Forests and diversion of water by the Bureau of Reclamation.

as authorized by permit, and its violation is punishable by civil and criminal penalties.¹⁵ The term “take” describes not only killing, injuring, or capturing a species, but also harassing, harming, or pursuing it, which includes habitat modification that injures the species.¹⁶ Thus, listing a species triggers a wide array of potential impacts on public and private activities as the agencies seek to ensure protection and recovery of the listed species.¹⁷

B. *Salmon Count: History and Significance of Salmon Declines and Artificial Propagation*

The Pacific Northwest has been described as “wherever the salmon can get to.”¹⁸ Salmon are interwoven into the history of the region: they are “the spiritual symbol of the Pacific Northwest”;¹⁹ they are “iconic fish that are integral to the identity of the Northwest.”²⁰

Protection of Pacific salmon is among the most important ESA issues in the nation, at times generating more newspaper coverage than any other ESA controversy.²¹ Critics and supporters

¹⁵ *Id.* §§ 1538(a)(1)(B), 1540(a)–(b). The former provision allows the agencies to regulate private land use.

¹⁶ *Id.* § 1532(19); 50 C.F.R. § 17.3 (2006). For background on the broad meaning of “take,” see SHANNON PETERSEN, ACTING FOR ENDANGERED SPECIES: THE STATUTORY ARK 73–74 (2002).

¹⁷ Not surprisingly, there is reason to believe that political factors influence listing. For instance, the Washington Post reported that, as of July 2004, an average of 9.5 species were listed per year under the Bush administration, while 65 per year were listed under the Clinton administration and 59 per year under the George H.W. Bush administration. Juliet Eilperin, *Endangered Species Act's Protections Are Trimmed*, WASH. POST, July 4, 2004, at A1. Similar numbers are reported in Doremus, *Science Plays Defense*, *supra* note 4, at 268; see also David W. Cash, *Beyond Cute and Fuzzy: Science and Politics in the U.S. Endangered Species Act*, in PROTECTING ENDANGERED SPECIES IN THE UNITED STATES 106, 133–34 (Jason F. Shogren & John Tschirhart eds., 2001) (finding evidence that “political decisions about funding recovery efforts strongly influence what science is undertaken, what species are studied, and thus what species are afforded attention”).

¹⁸ TIMOTHY EGAN, *THE GOOD RAIN: ACROSS TIME AND TERRAIN IN THE PACIFIC NORTHWEST* 22 (1990).

¹⁹ Brian J. Perron, *Just Another Goldfish Down the Toilet?: The Fate of Pacific Salmon After Alsea Valley and the De Facto Rescission of the 4(D) Rule*, 33 ENVTL. L. 547, 548 (2003).

²⁰ Editorial, *Bush v. Salmon: Two New Moves Undermine Salmon Recovery*, REGISTER-GUARD (Eugene, Or.), Dec. 2, 2004, at A10.

²¹ Laura J. Hendrickson, *Coverage of the Endangered Species Act in Four Major Newspapers*, 45 NAT. RESOURCES J. 135, 152 (2005) (canvassing stories in

of the statute regularly rely on salmon-related decisions as examples for their arguments. Stories of salmon protection impacting land use feature prominently in the arguments of organizations opposed to the ESA.²² Groups dedicated to preserving wild salmon runs argue that “[b]y focusing on salmon, we have the highest probability of protecting coastal ecosystems” because “[s]almon are the best indicator of coastal ecosystem health.”²³ Not surprisingly, salmon reflect many of the most important issues in ESA implementation.

Pacific salmon are anadromous fish—they are hatched in freshwater, migrate to the ocean, then return to freshwater to spawn shortly before death. In general, salmon return to their parental streams to spawn, which produces adaptation to a local environment over time. While there are only a few “species” of salmon in the taxonomic sense, there are many “stocks,” which are “self perpetuating populations that spawn generation after generation in the same location.”²⁴ Scientific discussions of salmon extinctions generally refer to stocks, rather than an entire species.²⁵ The stocks are usually distinguished on the basis of their genetic variability, preservation of which is important because genetic diversity within the species provides it with the ability to adapt to natural variations in its habitat.²⁶ Salmon also provide major benefits to the ecosystems they inhabit.²⁷

Before Europeans arrived, “North America’s Columbia River

the *Chicago Tribune*, *Los Angeles Times*, *New York Times*, and the *Washington Post*).

²² E.g., David Hogberg, *Dim Prospects for Property Rights*, ORGANIZATION TRENDS (Capital Research Center, Wash., D.C.), Feb. 2006, at 1, available at <http://www.capitalresearch.org/pubs/pdf/OT0206.pdf> (beginning a story critical of the ESA with the example of farmers who ceased receiving irrigation water in the Klamath Basin in 2001 in order to provide water for endangered salmon and sucker fish).

²³ Guido Rahr, Wild Salmon Center, *Why Salmon as a Focus of Conservation Efforts?: Integrating Conservation Strategies from Headwater to Ocean 1* (2007), available at <http://www.wildsalmoncenter.org/WhySalmon.pdf>. Guido Rahr—president of the Wild Salmon Center, a conservation organization—defines “coastal ecosystems” to include the rivers draining into the Pacific, which covers a much larger area than the immediate coastline. *Id.*

²⁴ Robert T. Lackey, *Pacific Northwest Salmon: Forecasting Their Status in 2100*, 11 REVS. IN FISHERIES SCI. 35, 42 (2003).

²⁵ *Id.*

²⁶ *Id.* at 43.

²⁷ Salmon are an important source of food for other animals and salmon die-offs after spawning provide important nutrients to their spawning areas. *Id.*

salmon runs were the most abundant on Earth.”²⁸ Estimates of salmon runs at that time suggest that seven to sixteen million fish returned to the Columbia River alone each year.²⁹ Pacific salmon runs in central California began to decline steeply at the time of the California gold rush in the mid-nineteenth century due to increased harvest and the impacts of mining.³⁰ Within a few decades, runs in the Columbia River basin also began to decline sharply, particularly with the advent of canneries in the late nineteenth century.³¹ The decline continued throughout the twentieth century.

A decade ago, the Commission on Life Sciences of the National Academy of Sciences found that Pacific salmon were no longer present in forty percent of their historic range and faced extinction risk in another twenty-seven percent.³² It further noted that many of the “populations that have not declined are composed largely or entirely of hatchery fish.”³³ In the early 1990s, Columbia River salmon runs had decreased to approximately one million fish.³⁴

The pressures on salmon include mining, timber operations, grazing, withdrawal of water for irrigation, and dams.³⁵ Dams must be understood as a major factor, in the Columbia River basin

²⁸ NAT’L RESEARCH COUNCIL, *MANAGING THE COLUMBIA RIVER: INSTREAM FLOWS, WATER WITHDRAWALS, AND SALMON SURVIVAL* 1 (2004).

²⁹ COMM’N ON LIFE SCIS., NAT’L ACAD. OF SCIS., *UPSTREAM: SALMON AND SOCIETY IN THE PACIFIC NORTHWEST* 46 (1996); *MANAGING THE COLUMBIA RIVER*, *supra* note 28, at 1.

³⁰ Lackey, *supra* note 24, at 36.

³¹ *Id.* at 49; *see* MICHAEL C. BLUMM, *SACRIFICING THE SALMON: A LEGAL AND POLICY HISTORY OF THE DECLINE OF COLUMBIA BASIN SALMON* 5–6 (2002).

³² COMM’N ON LIFE SCIS., *supra* note 29, at 75–76.

³³ *Id.* at 77.

³⁴ *MANAGING THE COLUMBIA RIVER*, *supra* note 28, at 1.

³⁵ *See* JIM LICHTOWICH, *SALMON WITHOUT RIVERS: A HISTORY OF THE PACIFIC SALMON CRISIS* 6 (1999); *see also* Mary H. Ruckelshaus et al., *The Pacific Salmon Wars: What Science Brings to the Challenge of Recovering Species*, 33 *ANN. REV. ECOLOGY & SYSTEMATICS* 665, 678–85 (2002); Lackey, *supra* note 24, at 36 (stating that decline “was caused by a well known but poorly understood combination of factors, including unfavorable ocean or climatic conditions; excessive commercial, recreational, and subsistence fishing; various farming and ranching practices; dams built for electricity generation, flood control, and irrigation, as well as many other purposes; water diversions for agricultural, municipal, or commercial requirements; hatchery production to supplement diminished runs or produce salmon for the retail market; degraded spawning and rearing habitat; predation by marine mammals, birds, and other fish species; competition, especially with exotic fish species; diseases and parasites; and many others”).

in particular, because they exclude salmon from major portions of the watershed.³⁶ Other factors, such as introduction of non-native species and variation in ocean conditions, may play a role in salmon declines.³⁷ Hatchery production and release of salmon has also contributed to the persistent decline of wild salmon.³⁸

Artificial propagation of salmon began over one hundred years ago and today produces many of the salmon in waters throughout the west.³⁹ From the beginning, West Coast salmon hatcheries were intended to replenish declining stocks⁴⁰ and were soon employed to replenish dwindling stocks in the Columbia River basin. Despite resounding failures due largely to ignorance of genetic distinctions between stocks, hatcheries gained steady support.⁴¹ They arose from and persisted because of “an overarching assumption that human intervention could improve upon and successfully manipulate nature.”⁴²

With the construction of dams in the 1930s to provide electricity and irrigation, hatcheries assumed even more importance.⁴³ Their inability to mitigate the impacts on salmon was, at best, an afterthought.⁴⁴ The Mitchell Act of 1938 and its amendment in 1946 signaled federal recognition that dams and other development harmed salmon, but effectively led to increased hatchery construction as a mitigation for development, which was understood to trump salmon concerns.⁴⁵ By the 1980s, hatcheries constructed under Mitchell Act authority produced approximately

³⁶ Lackey, *supra* note 24, at 50.

³⁷ *Id.* at 53.

³⁸ *Id.* at 51; *see also* Ruckelshaus et al., *supra* note 35, at 682–83. However, the impacts of hatchery fish on naturally propagating salmon are often difficult to assess. For example, allowing harvest of abundant hatchery fish almost certainly leads to some harvest of scarce wild fish, but the level is unknown. Lackey, *supra* note 24, at 51.

³⁹ Phillip S. Levin and John G. Williams, *Interspecific Effects of Artificially Propagated Fish: An Additional Conservation Risk for Salmon*, 16 CONSERVATION BIOLOGY 1581, 1582 (2002).

⁴⁰ The first hatchery, established in 1872, sought not to replenish fish in western waters, but to generate fish for transplantation to rivers in the eastern United States and the rest of the world, signaling a naive belief in hatcheries as a quick fix to the impact of development. BLUMM, *supra* note 31, at 110.

⁴¹ *Id.* at 110–11 (noting that the release of 50 million juvenile salmon had no recognizable impact on declines).

⁴² *Id.* at 111.

⁴³ *Id.* at 112.

⁴⁴ *See id.* at 112–13.

⁴⁵ *See id.* at 113–14.

100 million of the salmon released into the Columbia River annually.⁴⁶

Overall, approximately 1.2 billion juvenile salmon swim out of West Coast hatcheries each year.⁴⁷ Many western fisheries overwhelmingly consist of hatchery-reared fish. For example, in the Columbia River basin, “more than 95% of coho, 70% of spring-run chinook, 80% of summer-run chinook, 50% of fall-run chinook, and 70% of steelhead adults [were] reared in hatcheries.”⁴⁸ Hatchery fish dominate many fisheries because of the sharp decline of their natural cousins. Hatchery fish clearly have not stemmed the decline of wild salmon.⁴⁹ Instead, by the late twentieth century, scientists generally agreed that hatchery salmon contributed to the decline of wild salmon.⁵⁰

Hatchery-bred salmon transplanted from the specific habitat in which their broodstock lived have different genetic adaptations than the wild salmon in their new habitat.⁵¹ Further, for genetic and other reasons, hatchery-bred salmon are frequently inferior to wild fish in terms of ability to successfully survive and breed in the wild.⁵² Finally, when wild fish interbreed with hatchery-bred salmon, the genetic differences between them often leads to a fish genetically different from one which two wild salmon of the same stock would produce. This threatens the genetic adaptations of wild fish and may speed depletion of naturally-occurring stocks.⁵³

Since the early days of hatcheries, much has been learned about salmon. Scientific inputs have improved the ability of hatcheries to produce salmon that survive when released. This may offer the possibility of creating salmon that successfully

⁴⁶ *Id.* at 114.

⁴⁷ Levin & Williams, *supra* note 39, at 1581.

⁴⁸ *Id.* at 1582.

⁴⁹ *See id.*

⁵⁰ Ruckelshaus et al., *supra* note 35, at 682–83.

⁵¹ *See* RIK SCARCE, FISHY BUSINESS: SALMON, BIOLOGY AND THE SOCIAL CONSTRUCTION OF NATURE 102–03 (2000).

⁵² *Id.* at 104.

⁵³ *Id.* at 103–06. Importantly, not all “naturally-occurring” salmon result from breeding of purely “wild” fish—“naturally-occurring” salmon include offspring of hatchery-bred salmon. I use “wild” and “naturally-occurring” interchangeably in this Article, although I recognize a basis for making distinctions and do not imply that such distinctions are unimportant in other contexts. As will be clear in following sections, however, the important distinction for present purposes is between fish actually bred in hatcheries and all naturally-spawning salmon.

integrate into wild populations and, eventually, restore them.⁵⁴ Although potentially valuable in restoring endangered salmon, this use of hatchery technology also demonstrates the ever-expanding scope of human management and control over salmon.⁵⁵

The decline of salmon has brought economic hardship to many in the Pacific Northwest⁵⁶ and producing hatchery fish is expensive.⁵⁷ The costs of attempting to prevent salmon decline and restore wild runs is also high. Many efforts attempt to mitigate the impact of dams, including “fish ladders” that allow salmon to pass over the dams, transport of salmon in barges around dams, and other measures. These mitigation efforts provide mixed results, at best.⁵⁸ The outlook for future health of wild salmon populations, given current management efforts and development pressure, is not good.⁵⁹ Further, the pressures on wild salmon are likely to grow as the population of the Pacific Northwest

⁵⁴ For example, a NMFS Northwest Fisheries Science Center “Issues Paper” briefly identifies the problem and need for continued research. N.W. FISHERIES SCI. CTR., DEVELOP CONSERVATION HATCHERY TECHNOLOGY TO AID RECOVERY OF ESA-LISTED STOCKS OF PACIFIC SALMON, *available at* <http://www.nwfsc.noaa.gov/publications/issuepapers/pdfs/reut6201.pdf>.

⁵⁵ See SCARCE, *supra* note 51, at 120 (“The [genetic] knowledge being created represents the possibility of a level of control over salmon that only a few years ago was unimaginable”).

⁵⁶ Fishermen contend that salmon decline has cost approximately 72,000 salmon-related jobs and continues to prevent an estimated \$1.5 billion annually in salmon-related income. Glen Spain, *Why the Northwest Needs a Strong ESA* (1997), <http://www.cyberlearn.com/esa.htm>. Glen Spain is the Northwest Regional Director for the Pacific Coast Federation of Fishermen’s Association (PCFFA), the largest organization of commercial fishermen on the west coast. *Id.*

⁵⁷ One estimate placed the cost of propagating coho salmon in hatcheries at an average of \$97 per adult. Jonathan Brinkman, *Cost of Hatchery Salmon Careens from \$14 to \$530 Per Fish*, OREGONIAN, Nov. 12, 2002, at B1.

⁵⁸ Despite expenditures of approximately \$1.5 billion from 1997 to 2001 and confidence expressed by federal agencies that the efforts were having positive effects, a GAO report noted “there is little conclusive evidence” quantifying the impact of these efforts. GEN. ACCOUNTING OFFICE, COLUMBIA RIVER BASIN SALMON AND STEELHEAD: FEDERAL AGENCIES’ RECOVERY RESPONSIBILITIES, EXPENDITURES AND ACTIONS 2–4 (2002).

⁵⁹ See, e.g., ROBERT T. LACKEY, DEFENDING REALITY 2–3 (2001), <http://www.epa.gov/wed/pages/staff/lackey/pubs/reality.pdf>. A large project to understand the changes required to sustain salmon runs through 2100, headed by Dr. Lackey, began from the premise that the current forecast for salmon runs is bleak. See Beth Casper, *Experts Forecast Grim Future for Salmon*, STATESMAN J. (Salem, Or.), Feb. 17, 2005, at 1C.

increases.⁶⁰

The cost and restrictions imposed by efforts to revive dwindling stocks serve as a counterweight to the apparent need to continue protection efforts. Noting recent increases in salmon runs, some have argued that the protections of the ESA are too severe and unnecessary.⁶¹ They complain that the Pacific Northwest receives an inordinate share of the economic burden linked to protecting endangered species and note that salmon protection impacts logging, farming, and other activities.⁶²

One suggested method of alleviating this strain, after more than a century of less than promising hatchery experience, was to deem hatchery fish the full legal equivalent of wild fish. This could lead to removal of ESA protections for salmon and, in essence, allow hatchery fish to take the place of disappearing wild runs.

The decline of salmon is a direct indication of the human impact on the ecosystems they inhabit. As such, their decline is but one example of a biodiversity crisis currently facing society.⁶³ Understanding the conservation of wild salmon, which depends

⁶⁰ Lackey, *supra* note 24, at 40.

⁶¹ See, e.g., Leslie Marshall Lewallen & Russell C. Brooks, *Alsea Valley Alliance v. Evans and the Meaning of "Species" Under the Endangered Species Act: A Return to Congressional Intent*, 25 SEATTLE U. L. REV. 731, 731–32, 744–51 (2002). Few other scholarly articles take this position. Interestingly, the article those authors cite for reporting record salmon runs also noted that the runs resulted from a “big return of mostly hatchery fish, not a sudden dramatic resurgence of wild ones,” which the authors do not note. Editorial, *Wild Salmon Still Endangered*, SEATTLE POST-INTELLIGENCER, Dec. 30, 2001, at D6. Also, the large runs were generally attributed to improved ocean conditions. See, e.g., Matthew Preusch, *Birthplace Is Crucial Issue for Scientists Counting Salmon*, N.Y. TIMES, Apr. 6, 2004, at F2. Again, Lewallen and Brooks do not address this point. On the apparent contradiction of endangerment and record runs, see Lackey, *supra* note 24, at 39 (“[T]he recent ‘record’ runs in the Columbia are but a shadow of their 1850 level of 10 to 15 million, as well as being predominantly fish of hatchery origin. Although there are explanations, for many there continues to be the seeming contradiction of salmon abundance simultaneous with cries to confront risks of extinction.”). Non-scholarly examples of rhetoric opposing wild salmon recovery on this and other bases abound. Oregon State Senator Ted Ferrioli, for example, characterized wild salmon recovery as part of “the radical environmental agenda.” Beth Casper, *Comments on Environment Draw Partisan Reactions*, STATESMAN J. (Salem, Or.), Jan. 11, 2005, at 4A.

⁶² Lewallen & Brooks, *supra* note 61, at 744–51.

⁶³ See, e.g., EDWARD O. WILSON, *THE FUTURE OF LIFE* 99–102 (2003) (describing the current mass extinction and predicting that, if human-induced environmental damage continues unabated, half of all plant and animal species on the planet will become extinct within a century).

upon balancing a myriad of priorities, will contribute to understanding how to shape a response to similar issues throughout the nation and beyond. The implications of hatchery-bred salmon are particularly important because existing hatcheries offer either a substitute for wild salmon or a tool in their restoration.

The first Pacific salmon run was listed under the ESA in 1989.⁶⁴ The listing immediately drew public attention and generated controversy. Environmentalists and Native American tribes pushed for expanding protection to more salmon runs, while hydropower and commercial interests feared the potential economic impacts of the ESA and its threat to the dams.⁶⁵ The controversy has continued, more or less unabated, ever since. Much like the spotted owl forced dramatic reductions in old growth timber harvesting, listed salmon have the potential to change the face of the Pacific Northwest.⁶⁶ Thus, determining what groupings of salmon should be considered for listing under the ESA carries enormous significance.

C. *Defining Salmon Populations for Assessing Viability Under the ESA*

The ESA defines “species” 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.”⁶⁷ For salmon, the important aspect of the definition is the phrase “distinct population segment” (DPS), a legal term unique to

⁶⁴ Critical Habitat; Winter-Run Chinook Salmon, 54 Fed. Reg. 32,085 (Aug. 4, 1989); *see also* BLUMM, *supra* note 31, at 20–24.

⁶⁵ BLUMM, *supra* note 31, at 21–23, 173–74. When the first listing of a Columbia River salmon DPS was proposed in 1991, a New York Times article predicted “an epic fight over use of the biggest river in the West.” Timothy Egan, *U.S. Proposes Listing a Salmon as Endangered*, N.Y. TIMES, Apr. 3, 1991, at A16.

⁶⁶ After considering the extremely controversial debate over the spotted owl that virtually halted logging in the northwest, Professor Oliver A. Houck remarked, “Pacific salmon make the spotted owl look easy” because of the myriad sources of salmon decline and the extensive impact that concerted recovery efforts would have on major facets of the economy and society in the northwest. Oliver A. Houck, *On the Law of Biodiversity and Ecosystem Management*, 81 MINN. L. REV. 869, 931 (1997).

⁶⁷ 16 U.S.C. § 1532(16) (2000). Professor Holly Doremus has aptly described this provision as “merely a list masquerading as a definition.” Doremus, *Listing*, *supra* note 7, at 1089.

the ESA with no independent scientific meaning.⁶⁸ Before the question arose in other areas, NMFS found it necessary to clarify what DPS means for Pacific salmon.

In 1991, NMFS issued the *Policy on Applying the Definition of Species Under the Endangered Species Act to Pacific Salmon*, an effort to give the DPS concept application to salmon.⁶⁹ The first step was creating a new term, “evolutionarily significant unit” (ESU).⁷⁰ From a scientific perspective, defining an ESU is an attempt to protect a group of stocks, whose loss would be significant for the genetic or ecological diversity of the species.⁷¹ The approach avoids the more extensive impact that could result from either considering each stock a DPS, which could produce a patchwork of many more listings; it also avoids considering an entire salmon species for listing, which would not likely produce an immediate listing but would have a very extensive impact if one occurred.⁷²

NMFS established two criteria for determining whether a salmon stock qualifies as an ESU:

- (1) It must be substantially reproductively isolated from other conspecific population units; and
- (2) It must represent an important component in the evolutionary legacy of the species.⁷³

These criteria continue to provide the basis for determining whether a Pacific salmon population constitutes a distinct entity for listing purposes. NMFS relies on behavior and genetic evidence to determine reproductive isolation. The criteria of evolutionary importance “would be met if the population contributed substantially to the ecological/genetic diversity of the species as a whole.”⁷⁴ To make this determination, NMFS relies on genetic information as well as the distinctiveness of the habitat and adaptations of the population.

⁶⁸ See Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act, 61 Fed. Reg. at 4722.

⁶⁹ Policy on Applying the Definition of Species Under the Endangered Species Act to Pacific Salmon, 56 Fed. Reg. 58,612, 58,612 (Nov. 20, 1991).

⁷⁰ *Id.* at 58,612.

⁷¹ Lackey, *supra* note 24, at 43; see also Ruckelshaus et al., *supra* note 35, at 672–75.

⁷² See Lackey, *supra* note 24, at 43.

⁷³ Policy on Applying the Definition of Species Under the Endangered Species Act to Pacific Salmon, 56 Fed. Reg. at 58,618.

⁷⁴ *Id.*

Although the scientific basis of the policy may make application of the indefinite language of the statute more predictable, the questions it addresses are not exclusively scientific. Commentary on the policy, from the time it was issued through the present, reflects the imperfection of a scientific answer.⁷⁵ Professor Doremus, for example, concludes that the emphasis on genetics in the policy “likely reflects [the agency’s] desire to make the identification of population segments appear scientific.”⁷⁶ She argues that the focus on genetics “allows the agencies to bury their decisions” in complex scientific details, thus making decisions more likely to survive litigation and avoiding prolonged public policy discussions about what constitutes a protectable entity.⁷⁷ Even if such a desire motivated the policy, recognition was prompt and frank that its answer to the problem of determining what salmon groupings may be considered for listing was incomplete. National Oceanic & Atmospheric Administration (NOAA) attorneys noted in an article published shortly after the policy was adopted, “[i]n most cases, [the policy’s criteria] suggest further unresolved questions.”⁷⁸ Despite apparent shortcomings, however, the ESU policy remains in place and has proved workable.

II. HATCHERY-BRED SALMON UNDER THE ESA: FRAMING THE ISSUE

With the ESU policy in place, NMFS had to determine how the presence of hatchery-bred salmon affected the status of naturally-occurring salmon for listing purposes. Although a statutory answer would resolve the issue, it is not forthcoming. NMFS’s “interim” policy on the issue would govern for nearly a decade until a district court decision sparked a prolonged reconsideration of it.

A. *The Ambiguous Status of Hatchery-Bred Salmon: Statutory Language and Legislative History*

On its face, the ESA’s definition of “species” is ambiguous as

⁷⁵ For an early example, 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 (1994).

⁷⁶ Doremus, *Listing*, *supra* note 7, at 1107.

⁷⁷ *Id.* at 1107–08.

⁷⁸ Karl Gleaves et al., *The Meaning of “Species” Under the Endangered Species Act*, 13 PUB. LAND L. REV. 25, 44 (1992).

to whether it allows consideration of hatchery origin in determining what constitutes a DPS of Pacific salmon. The issue raised by hatchery salmon highlights an ambiguity that arises in other contexts. At the same time, there is no universal scientific definition of “species” to employ when interpreting the ESA.⁷⁹ Looking behind the statute’s text to legislative history suggests that Congress intended the ESA to conserve both ecosystems and genetic diversity, but does not definitively resolve the hatchery-bred salmon issue.

The term “species” as used in the ESA can be traced to the nation’s first endangered species act, the Endangered Species Preservation Act of 1966, which contained the term but did not define it.⁸⁰ In 1969, Congress specifically provided for the listing of animal subspecies, but again did not provide a definition.⁸¹ When the ESA was passed in 1973, Congress defined the term “species” for the first time. The definition included “any subspecies of fish or wildlife or plants and any other group of fish or wildlife of the same species or smaller taxa in common spatial arrangement that interbreeds when mature.”⁸² Finally in 1978, Congress revisited the definition of “species” and, after the Senate rejected a narrow definition focused on sexual incompatibility that was passed by the House,⁸³ amended it into its present form by substituting the term “distinct population segment” for the previous “any other group” language and clearly restricting application of that term to vertebrate populations.⁸⁴

The congressional goals that lie behind the ESA provide limited and somewhat mixed support for protection of wild fish and exclusion of hatchery salmon from protection. The ESA

⁷⁹ See generally Doremus, *Listing*, *supra* note 7, at 1097–1112; Fred Bosselman, *A Dozen Biodiversity Puzzles*, 12 N.Y.U. ENVTL. L.J. 364 (2004) (exploring many related and perplexing issues of biodiversity protection, including taxonomical questions).

⁸⁰ Endangered Species Preservation Act of 1966, Pub. L. No. 89-669, § 1, 80 Stat. 926, 926, *repealed by* Endangered Species Act of 1973, Pub. L. No. 93-205, § 14, 87 Stat. 884, 903.

⁸¹ The Endangered Species Conservation Act of 1969, Pub. L. No. 91-135, § 3(a), 83 Stat. 275, 275 *repealed by* Endangered Species Act of 1973, Pub. L. No. 93-205, § 14, 87 Stat. 884, 903.

⁸² Endangered Species Act of 1973, Pub. L. No. 93-205, § 3(11), 87 Stat. 884, 886.

⁸³ Endangered Species Act Amendments of 1978, H.R. 14104, 95th Cong. § 5(2) (2d Sess. 1978).

⁸⁴ Pub. L. No. 95-632, § 2(5), 92 Stat. 3751, 3752 (1978).

explicitly identifies protection of ecosystems as one of its purposes and requires designation of critical habitat, which provides a means to fulfill this purpose.⁸⁵ This explicit goal and the congressional purpose behind it provide the most direct support for the argument that the ESA requires protection of wild species because the value of ecosystems lies in their ability to support self-sustaining populations.⁸⁶ The House Report on the original bill described ecosystem protection as a “basic purpose of the Act” and discussed the “critical nature of the interrelationships of plants and animals between themselves and with their environment.”⁸⁷ The Senate debate on the original bill included recognition that “each species is a part of an immensely complicated ecological organization, the stability of which rests on the health of its components.”⁸⁸ This view harmonizes with current efforts to protect wild fish as an indicator ensuring a level of protection for the broader ecosystem. To the extent that the ESA was designed as a means of providing ecosystem protection, it supports focusing on wild salmon as the entity requiring protection, irrespective of hatchery production.

Another element of the congressional intent behind the ESA was protecting the diversity of genetic resources. In identifying the need for the legislation, the House Report that accompanied the original ESA text discussed threats to our “genetic heritage,” describing that heritage as a resource of “incalculable” value—holding “keys to puzzles which we cannot solve [that] may provide answers to questions which we have not yet learned to ask.”⁸⁹ This passage also states that if a genetic code were destroyed, “it would

⁸⁵ 16 U.S.C. §§ 1531(b), 1533(b)(2) (2000).

⁸⁶ NMFS has reached this conclusion in both of its policies concerning hatchery salmon. Interim Policy on Artificial Propagation of Pacific Salmon Under the Endangered Species Act, 58 Fed. Reg. 17,573, 17,574 (Apr. 5, 1993); *see also* Policy on the Consideration of Hatchery-Origin Fish in Endangered Species Act Listing Determinations for Pacific Salmon and Steelhead, 70 Fed. Reg. 37,204, 37,207–08, 37,215 (June 28, 2005) (to be codified at 50 C.F.R. §§ 223–224). For analyses supporting the view that the ESA requires protection of wild species, *see* Trout Unlimited v. Lohn, 2007 U.S. Dist. LEXIS 42858, *47–52 (W.D. Wash. June 13, 2007); Doremus, *Wild*, *supra* note 12, at 10–11.

⁸⁷ H.R. REP. NO. 93-412, at 6 (1973).

⁸⁸ 119 CONG. REC. S25,668 (1983) (statement of Sen. Tunney). This perspective has recently received additional scientific support. *See* Daniel E. Bunker & Shahid Naem, Letter to the Editor, *Species Diversity and Ecosystem Functioning*, 312 SCI. 846, 847 (2006).

⁸⁹ H.R. REP. 93-412 at 4–5.

not be possible to replace it—it would simply be gone. Irretrievably. Forever.”⁹⁰ If the statute’s primary goal is protection of genetic lineage, hatchery fish might be understood as a full substitute. However, this understanding could also support maintenance of species in zoos or even gene banks as a means of satisfying the statute. Although this view has been endorsed on occasion,⁹¹ it is not legitimate because it completely ignores the statute’s ecosystem protection goal.⁹² Further, the “genetic code” rationale stated in the House Report is dubious in light of extensive scientific advances in genetics. Although Congress may have viewed maintenance of ecosystems as a prerequisite to maintaining genetic diversity in the 1970s, the two rationales are not necessarily co-dependent today.

Another bit of legislative history that may inform an understanding of whether the ESA requires protection of wild salmon is Congress’s explicit rejection of a proposal to remove authority to list DPSs while developing the 1979 amendments to the Act.⁹³ Without authority to list a DPS, the entire structure of salmon policy under the ESA would be much different. Prior to the 1979 amendments, the General Accounting Office (GAO) urged an amendment that would prevent listings at the DPS level based on concerns that the authority could lead to situations such as the “listing of squirrels in a specific city park, even though there is an abundance of squirrels in other parks in the same city.”⁹⁴ FWS and NMFS opposed this amendment because it would restrict their ability to tailor protection to the needs of species.⁹⁵ Siding with NMFS and FWS, a Senate report cited the example of the bald eagle, which was endangered in the lower forty-eight states but thriving in Alaska, stating that under the GAO proposal both populations would receive the same level of protection.⁹⁶ The

⁹⁰ *Id.* at 4.

⁹¹ See *infra* text accompanying note 190.

⁹² See Oliver A. Houck, *Why Do We Protect Endangered Species, and What Does That Say About Whether Restrictions on Private Property to Protect Them Constitute “Takings”?*, 80 IOWA L. REV. 297, 298–99 (1995); see also Doremus, *Wild*, *supra* note 12, at 14–15.

⁹³ S. REP. NO. 96-151, at 6–7 (1979).

⁹⁴ *Id.* at 7; GEN. ACCOUNTING OFFICE, ENDANGERED SPECIES—A CONTROVERSIAL ISSUE NEEDING RESOLUTION ii, 52 (1979).

⁹⁵ S. REP. NO. 96-151, at 7.

⁹⁶ *Id.* A similar point could be made by comparing thriving salmon stocks in Alaska with endangered stocks at lower latitudes.

report instructs, however, that listing of populations should be used “sparingly and only when the biological evidence indicates that such action is warranted.”⁹⁷ Congress’s ultimate rejection of GAO’s proposal suggests intent to provide the agencies flexibility in determining what constitutes a listable entity, provided that decisions have a scientific foundation. Arguably, Congress intended to leave issues such as the status of hatchery fish to agency resolution.

The final chapter in the legislative history relevant to the hatchery salmon issue is the addition of the requirement that listing decisions be based solely on the best available scientific data. Congress added the requirement in 1982 to exclude economic considerations and break regulatory deadlock in listing decisions.⁹⁸ This science requirement does not bear on the issue of hatchery-bred salmon. However, it provides a limit on administrative discretion that must be harmonized with the flexibility provided by the DPS provision. For this reason, a sound scientific analysis of the relationship between hatchery-bred and naturally-occurring salmon might be expected to resolve the debate.

In my view, the stronger interpretation of the ESA favors protecting wild salmon because the statute expressly seeks to protect “the ecosystems upon which . . . species depend.”⁹⁹ This provision favors protection of naturally-occurring salmon because hatchery-bred salmon have a much lower dependence on ecosystems. The goal has no virtually no application to salmon if non-hatchery reproduction is unimportant. Clearly it does not intend to protect hatcheries. In addition, propagation is the essential activity for continuation of a species, and Congress almost certainly expected species to depend on their ecosystems for, among other things, reproduction. Thus, in the absence of language to the contrary in the statute, the explicit aim of protecting ecosystems should prevail. Legislative history concerning protection of genetics should not undercut this explicit goal in applying the ESA to salmon. However, this view has not always prevailed in NMFS’s and courts’ determinations concerning hatchery-bred salmon.

⁹⁷ *Id.*

⁹⁸ See sources cited *supra* note 7.

⁹⁹ 16 U.S.C. § 1531(b) (2000).

B. *Interim Policy Delineating the Relationship
Between Wild and Hatchery Salmon*

NMFS began to tackle the hatchery salmon issue in the early 1990s. In 1992, NMFS scientists released a technical memorandum analyzing the relationship between natural and artificial salmon.¹⁰⁰ The memorandum espoused a cautious view of artificial propagation, emphasizing that the ESA's goals require the protection of natural fish.¹⁰¹ It concluded that Pacific salmon ESUs should be determined based on the natural specimens, reflecting the perceived importance of preserving genetic diversity among natural salmon.¹⁰² The memorandum cautiously supported inclusion of artificially propagated salmon that are genetically similar to a natural ESU in the ESU for the purpose of restoring a naturally-propagating population.¹⁰³ Overall, the memorandum viewed hatcheries as a potential tool for use in restoring listed salmon, but also provided strong cautions concerning the risks that artificially-propagated fish could pose.¹⁰⁴

NMFS embraced the reasoning of the technical memorandum in its 1993 *Interim Policy on Artificial Propagation of Pacific Salmon Under the Endangered Species Act*.¹⁰⁵ The Federal Register announcement stated unequivocally that "evaluation of the species' status for listing or delisting under the ESA depends on natural populations, which for Pacific salmon are defined as the progeny of naturally reproducing fish."¹⁰⁶ NMFS explained the determination in terms of the statute's purpose of protecting the

¹⁰⁰ JEFFREY J. HARD ET AL., NMFS, PACIFIC SALMON AND ARTIFICIAL PROPAGATION UNDER THE ENDANGERED SPECIES ACT Part I (1992), available at <http://www.nwfsc.noaa.gov/publications/techmemos/tm2/tm2.html>.

¹⁰¹ *Id.*

¹⁰² *Id.* at Part II.

¹⁰³ *Id.*

¹⁰⁴ *E.g., id.* at Part I ("[I]t is unclear whether or how much artificial propagation during the recovery process will compromise the distinctiveness of natural populations. Also unclear is whether or how much ongoing hatchery programs for unlisted species will affect the recovery of listed species or the viability of other unlisted species.").

¹⁰⁵ *Interim Policy on Artificial Propagation of Pacific Salmon Under the Endangered Species Act*, 58 Fed. Reg. 17,573, 17,573 (Apr. 5, 1993).

¹⁰⁶ *Id.* This definition of wild fish is one of several options, including more restrictive definitions that would exclude the first-generation naturally-spawned progeny of hatchery fish. *See, e.g.,* Lackey, *supra* note 24, at 39. No specific definition is scientifically mandated.

ecosystems on which species depend.¹⁰⁷ NMFS concluded that the ESA requires restoration of species in their natural habitats, thus “the ESA’s focus is . . . on natural populations.”¹⁰⁸ The policy, tracking the technical memorandum, then explained that artificial propagation may be used in recovery efforts, but that it also posed significant risks that could undermine efforts to achieve the goals of the ESA.¹⁰⁹

Although the 1993 policy document emphasizes scientific considerations, it also reflects an unequivocal social policy choice to focus on recovery of naturally-occurring populations. Even if a biological basis for including a hatchery population within the ESU exists, “[i]n general, such fish will not be included as part of the listed species.”¹¹⁰ However, the policy document establishes that if “[g]enetic resources important to the species’ evolutionary legacy” reside in hatchery fish, they “can be considered part of the biological ESU.”¹¹¹ In such a case, hatchery fish “could also be included as part of the listed species and protected under the ESA” if they “are considered to be essential for recovery” of the natural population.¹¹² Hatchery-bred fish not deemed essential for recovery would not receive protection.

The interim hatchery policy guided the agency’s determination of ESA status for salmon from its promulgation in 1993 until 2001. Typically the agency determined that a threatened or endangered ESU included some hatchery populations, but that only the natural population required listing protection because the hatchery populations were not essential for recovery.¹¹³

The Oregon Coast coho ESU listing determination, atypical in some respects, served as the backdrop for the next major development in NMFS’s hatchery policy. The agency first

¹⁰⁷ Interim Policy on Artificial Propagation of Pacific Salmon Under the Endangered Species Act, 58 Fed. Reg. at 17,573.

¹⁰⁸ *Id.*

¹⁰⁹ *Id.* at 17,573–74.

¹¹⁰ *Id.* at 17,575.

¹¹¹ *Id.* at 17,574.

¹¹² *Id.* at 17,574–75.

¹¹³ See Kristin A. Gaston, Note, *Salmon, Hatcheries, and the Endangered Species Act: Alsea Valley Alliance v. Evans and its Implications*, 81 VA. ENVTL. L.J. 123, 144–45 (2003) (“Of the fifty-one ESUs defined by NOAA Fisheries, the agency listed twenty-six species as endangered or threatened but denoted hatchery populations as ‘essential for recovery’ in only two cases.”).

proposed listing the ESU in 1995 following a comprehensive status review of Pacific salmon.¹¹⁴ Prior to reaching a listing determination, the agency engaged in an extensive discussion of the application of its ESU policy in order to determine the appropriate groupings of the species to consider for listing purposes.¹¹⁵ Following a review of the status of the populations and the factors affecting them, the agency ultimately proposed listing six ESUs. It proposed listing the Oregon Coast coho ESU as threatened, partially because of the influence of hatchery fish on the natural fish.¹¹⁶ Shortly thereafter, however, NMFS entered into an agreement with the State of Oregon designed to provide protection under the state's salmon restoration plan and, on that basis, determined that listing the ESU was not warranted.¹¹⁷ The Oregon Natural Resources Council and other environmental groups successfully challenged that decision as an impermissible reliance on future and voluntary restoration measures.¹¹⁸ Thereafter, NMFS listed the wild members of the ESU as threatened, but excluded the nine associated hatchery populations from the listing.¹¹⁹

C. *Public Support and Opposition for Salmon Protection*

In the 1990s, the public largely supported the policy of focusing salmon protection efforts on wild fish. For example, when NMFS listed nine DPSs of salmon in 1999, in what the *New York Times* described as “the broadest [application of the ESA] in the statute’s 26-year history in terms of both geography and the effect on a human population,” the newspaper also reported that

¹¹⁴ Proposed Threatened Status for Three Contiguous ESUs of Coho Salmon Ranging from Oregon Through Central California, 60 Fed. Reg. 38,011, 38,011 (July 25, 1995).

¹¹⁵ *Id.* at 38,012–18.

¹¹⁶ *Id.* at 38,021.

¹¹⁷ Threatened Status for Southern Oregon/Northern California Coast Evolutionarily Significant Unit (ESU) of Coho Salmon, 62 Fed. Reg. 24,588, 24,588 (May 6, 1997). See generally Christine Golightly, Note, *The Oregon Coastal Salmon Restoration Initiative: A Flawed Attempt to Avoid ESA Listing*, 7 N.Y.U. ENVTL. L.J. 398 (1999) (discussing the Oregon Plan and related events). In 2006, NMFS determined that the ESU did not warrant listing due to actions taken under the plan. See *infra* Part IV.C.2.

¹¹⁸ Or. Natural Res. Council v. Daley, 6 F. Supp. 2d 1139, 1153 (D. Or. 1998).

¹¹⁹ Threatened Status for the Oregon Coast Evolutionarily Significant Unit of Coho Salmon, 63 Fed. Reg. 42,587, 42,587 (Aug. 10, 1998).

opinion “polls indicate overwhelming support here for doing whatever is necessary to save the salmon.”¹²⁰

In 1997, the idea of breaching dams to protect the salmon runs was portrayed as a new, but not wholly unrealistic, idea in the press.¹²¹ By 2000, breaching major dams to restore wild salmon runs appeared a real possibility and had gained the support of Oregon Governor John Kitzhaber.¹²² A *New York Times* editorial argued in favor of breaching dams, pointing to the expense and failure of mitigation measures such as fish ladders and hatcheries.¹²³

At the same time as public opinion appeared overwhelmingly supportive of salmon protection, there were indications that the price of such protection could be too high for many to accept.¹²⁴ For example, although most Seattle residents reported that they supported protection of the wild fish, fewer were willing to bear additional expense for such protection.¹²⁵ Indeed, as environmental organizations pushed for additional measures to protect salmon, most notably and controversially dam-breaching, opposition began to increase. This opposition became more pronounced after public airing of a video showing Oregon Department of Wildlife officials clubbing hatchery salmon due to a perceived genetic threat they posed.¹²⁶ The video made vivid the apparent contradiction of restricting both human activity and hatchery production.

D. Alsea Valley Alliance v. Evans

In 1999, the Pacific Legal Foundation (PLF), an organization

¹²⁰ Sam Howe Verhovek, *An Expensive Fish*, N.Y. TIMES, Mar. 17, 1999, at A14.

¹²¹ See *New Plan for Rescuing the Salmon*, N.Y. TIMES, Apr. 21, 1997, at B8.

¹²² Sam Howe Verhovek, *Oregon's Governor Favors Breaching 4 Major Dams*, N.Y. TIMES, Feb. 19, 2000, at A9.

¹²³ Editorial, *Saving the Snake River Salmon*, N.Y. TIMES, Apr. 2, 2000 (Week in Review), at 14; see also Editorial, *Salmon Need Right of Way*, L.A. TIMES, June 10, 2000, at 9.

¹²⁴ See, e.g., David Foster, *Everyone Wants to Save a Fish—Sans Sacrifice*, L.A. TIMES, July 8, 2001, at B1.

¹²⁵ Sandi Doughton, *Poll Finds Strong Support for Protecting Wild Salmon*, NEWS TRIB. (Tacoma, Wash.), Feb. 20, 1998, at A1. For many, salmon may symbolize broader societal changes that they desire. See generally James Fallows, *Saving Salmon, or Seattle?*, ATLANTIC MONTHLY, Oct. 2000, at 20.

¹²⁶ See, e.g., Jeff Barnard, *Salmon-Killing Video Throws Fish Program into Question*, L.A. TIMES, Mar. 26, 2000, at 1 (discussing the video).

that describes itself as “a potent representative in the courts for Americans who have grown weary of overregulation by big government, overindulgence by the courts, and excessive interference in the American way of life,”¹²⁷ challenged the Oregon Coast coho salmon ESU listing. PLF commenced *Alsea Valley Alliance v. Evans*¹²⁸ against NMFS on behalf of the Alsea Valley Alliance, which was composed of Oregon residents impacted by land use restrictions related to the listing.¹²⁹ Ultimately, an Oregon district court invalidated the listing of the Oregon Coast coho ESU.

The rationale for *Alsea*'s holding called into question all listings under the 1993 hatchery policy. Although the court quoted the purposes of the statute in its opinion,¹³⁰ it emphasized that the statute “recognizes that conservation of listed species may be facilitated by artificial means.”¹³¹ Further, the court observed that the ESA specifically refers to “conservation” as “activities associated with scientific resources management” and explicitly includes propagation as such an activity.¹³² In effect, PLF convinced the court that the 1993 hatchery policy was an unauthorized interpretation of the ESA because it impermissibly distinguished between members of an ESU on the basis of hatchery origin.

The court concluded that the 1991 ESU policy “is a permissible agency construction of the ESA,” which properly rests on genetic and geographic considerations.¹³³ However, the court concluded that the analysis used in the Oregon Coast coho ESU listing determination, which applied the 1993 hatchery policy, “makes improper distinctions, below that of a DPS, by excluding hatchery coho populations . . . even though they are determined to be part of the same DPS as natural coho populations.”¹³⁴ Thus, the

¹²⁷ Pacific Legal Found., About Us, <http://www.pacificlegal.org/?mvcTask=about> (last visited Apr. 20, 2007).

¹²⁸ *Alsea Valley Alliance v. Evans*, 161 F. Supp. 2d 1154, 1154 (D. Or. 2001).

¹²⁹ Lewallen & Brooks, *supra* note 61, at 735–36.

¹³⁰ *Alsea*, 161 F. Supp. 2d at 1156 (noting that the purpose of the ESA are “to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved” (quoting 16 U.S.C. § 1531(b) (2000))).

¹³¹ *Id.* at 1157.

¹³² *Id.*

¹³³ *Id.* at 1161.

¹³⁴ *Id.* at 1162. The court did not address the validity of the 1993 hatchery

court held the listing arbitrary and capricious “because it relied on factors upon which Congress did not intend the NMFS to rely.”¹³⁵ The court reasoned that “[o]nce NMFS determined that hatchery spawned coho and naturally spawned coho were part of the same DPS/ESU, the listing decision should have been made without further distinctions between members of the same DPS/ESU.”¹³⁶

More broadly, the court announced that, “[l]isting distinctions below that of subspecies or a DPS of a species are not allowed under the ESA.”¹³⁷ For support, it cited *Southwest Center for Biological Diversity v. Babbitt*.¹³⁸ Reliance on *Southwest* for this proposition, however, is dubious. *Southwest* held that NMFS acted arbitrarily in requiring that all members of a DPS be members of the same subspecies.¹³⁹ *Alea*’s conclusion, to the extent it is related to *Southwest*, is the inverse: NMFS may not distinguish between members of a DPS.

The strongest argument in favor of protecting only wild fish grows from the ESA’s goal that not only species, but also the “ecosystems upon which [they] depend,” receive protection.¹⁴⁰ However, the *Alea* court did not discuss the relationship between concrete hatchery pools and the ecosystems upon which naturally-spawning salmon depend. Instead, the court addressed the apparent goal of protecting genetic diversity, concluding that although the listing decision accorded with this goal of the ESA, that cannot “justify a listing decision that runs contrary to the

policy, apparently because the statute of limitations for challenging that policy had passed. *See id.* at 1160–61.

¹³⁵ *Id.* at 1161. The case generated a flurry of legal commentary, much of which criticized its reasoning. *E.g.*, Perron, *supra* note 19, at 578–84 (“Judge Hogan’s decision would certainly stand as more principled were it not to appear he was swayed more by a laical disbelief . . . and a clouded foray into legislative history, than by a plain reading of the statutory language . . .”); Gaston, *supra* note 113, at 150–53 (stating that some of the court’s “comments, in dicta with no scientific support . . . fueled the ongoing scientific and political controversy”).

¹³⁶ *Alea*, 161 F. Supp. 2d at 1162. This called into question all listings of ESUs associated with hatchery populations under the 1993 policy.

¹³⁷ *Id.*

¹³⁸ *Id.* (citing *Sw. Ctr. for Biological Diversity v. Babbitt*, 980 F. Supp 1080, 1085 (D. Ariz. 1997)).

¹³⁹ *Sw. Ctr. for Biological Diversity*, 980 F. Supp at 1085 (“[I]f Congress had intended that a DPS contain only one subspecies, it would have allowed only the listing of ‘DPSs’ of *subspecies*. Instead, the statute reads ‘any distinct population segment of any species.’”).

¹⁴⁰ 16 U.S.C. § 1532(b) (2000).

definition of a DPS.”¹⁴¹

The ESA does not contain a definition of DPS. NMFS’s ESU policy provides such a definition for Pacific salmon, which the court applied. Thus, the court effectively invalidated the listing, and called the 1993 hatchery policy into question, for conflicting with the 1991 ESU policy, not the language of the statute. In this way, the court placed excessive reliance on NMFS’s ESU policy, which emphasizes genetics to the exclusion of other concerns. The statute’s explicit purposes do not refer to genetics, but do mandate protection of ecosystems.¹⁴² The court should have addressed this goal of the statute, which lends strong support to distinguishing between fish spawning in rivers and fish bred in hatcheries. Instead, the court observed that “the NMFS listing decision creates the unusual circumstance of two genetically identical coho salmon swimming side-by-side in the same stream, but only one receives ESA protection while the other does not. The distinction is arbitrary.”¹⁴³ This observation ignores not only the goal of protecting ecosystems, but the scientific community’s concern with genetic threats hatchery-bred fish may pose to genetically *similar* wild fish.¹⁴⁴

Alsea muddied the legal waters in an area where a clear policy had dominated.¹⁴⁵ In the short run, at least, the apparent mandate of *Alsea* seemed likely to reduce restrictions associated with salmon protection.¹⁴⁶ Fishermen’s associations and conservationists appealed the decision following an intervention order by the district court finding that the government no longer represented their interests, but the Ninth Circuit dismissed the appeal for lack of jurisdiction, reasoning that the district court’s remand for the agency to fashion a new rule was not a final

¹⁴¹ *Alsea*, 161 F. Supp. 2d at 1163. However, the court “agree[d] with the general concept that ‘genetic diversity’ is one factor in the long term success of a threatened species, and thus is one of the many goals underlying the ESA.” *Id.*

¹⁴² See 16 U.S.C. § 1531(b); see also *infra* Part II.A.

¹⁴³ *Alsea*, 161 F. Supp. 2d at 1163.

¹⁴⁴ See *supra* text accompanying notes 50–53.

¹⁴⁵ See, e.g., PATTI GOLDMAN, THE CURRENT ATTACK ON THE SALMON LISTINGS: ALSEA VALLEY ALLIANCE AND ITS IMPLICATIONS 1 (2001), available at <http://www.earthjustice.org/library/references/Salmon-20Listing-20Paper.pdf>; Perron, *supra* note 19, at 589.

¹⁴⁶ See David Foster, *In Oregon, Hatcheries Spawn a Salmon Struggle*, WASH. POST, Apr. 21, 2002, at A6 (noting that “logging quickly resumed where it had been blocked by protections for the coho” after *Alsea*).

judgment as to the non-agency appellants.¹⁴⁷ As the Ninth Circuit did not pass on the merits, the authority of the district court's decision remains questionable.¹⁴⁸ Nonetheless, the case had significant practical impact and the agency's effort to respond illustrates serious unresolved issues underlying the ESA and, perhaps, biodiversity policy more generally.

The immediate significance of *Alsea* was the possibility that once hatchery fish were included in ESUs, stocks that would otherwise be listed will not be listed.¹⁴⁹ Over time, and particularly following the Ninth Circuit's dismissal, environmentalists moved toward a conclusion that the case was not as important as originally thought, apparently because the delisting of wild salmon seemed inconceivable.¹⁵⁰ At a minimum, however, *Alsea* required NMFS to reconsider its hatchery policy.

II. RESOLVING THE HATCHERY QUESTION: DEBATE AND AGENCY ACTION IN RESPONSE TO *ALSEA*

A. NMFS's Initial Proposals

1. *Plan to Protect Self-Sustaining Populations*

In 2002, NMFS released a draft updated policy for

¹⁴⁷ *Alsea Valley Alliance v. Dep't of Commerce*, 358 F.3d 1181, 1184 (9th Cir. 2004) (“[O]nly agencies compelled to refashion their own rules face the unique prospect of being deprived of review altogether. An agency, after all, cannot appeal the result of its own decision.”).

¹⁴⁸ In June 2007, the District Court for the Western District of Washington issued a decision flatly contradictory to the reasoning in *Alsea*. *Trout Unlimited v. Lohn*, No. CV06-0483-JCC, 2007 U.S. Dist. LEXIS 42858, *47–52 (W.D. Wash. June 13, 2007), discussed *infra* Section IV.E.

¹⁴⁹ E.g., Robert L. Fischman, *Cooperative Federalism and Natural Resources Law*, 14 N.Y.U. ENVTL. L.J. 179, 220 (2005) (noting that if “hatchery spawned fish are added to the population counts of many salmon runs, the numbers may exceed the listing threshold”).

¹⁵⁰ GOLDMAN, *supra* note 145, at 21 (“the one scenario that is not viable is a NMFS’ [sic] decision to deny protection to the wild salmon that are currently listed.”); PERRON, *supra* note 19, at 585–86 (“[C]onservation groups appear to be nonchalant about the possibility *Alsea Valley* will be affirmed, apparently believing instead that a defeat on appeal could be mitigated by NMFS action . . .”). Indeed, much of the scientific community, including many affiliated with NMFS, held a strong opinion that recovery efforts should focus on wild fish, irrespective of successful hatchery-bred populations. See *infra* Part V.B.; see also Timothy Egan, *Shift on Salmon Reignites Fight on Species Law*, N.Y. TIMES, May 9, 2004, at A1.

consideration of hatchery fish.¹⁵¹ The draft policy clearly stated the agency's position:

NMFS understands the goal of the ESA to be the preservation of self-sustaining naturally reproducing populations in their natural habitats. Under this view, the intent of the ESA would not be realized if natural populations were not viable and the production of ESU fish depended on salmon being artificially spawned and reared as juveniles in a hatchery, since the population would be absent from its native ecosystem for a substantial portion of its life cycle.¹⁵²

Listing decisions would be based on whether salmon populations "are likely to be self-sustaining in their natural ecosystems."¹⁵³ Thus, although the draft policy reflected an update in direct response to *Aalsea* that sought to ensure "that hatchery populations are listed under the ESA when appropriate,"¹⁵⁴ the draft policy unabashedly aimed to protect and recover imperiled wild fish, recognizing the uncertain benefits and potential dangers posed by hatchery fish.

2. *A Plan to Count Artificially-Propagated Fish in Listing Determinations*

Following on the heels of the Ninth Circuit's dismissal of the appeal in *Aalsea*, NMFS suggested a plan that would fully count hatchery-bred fish along with wild fish for determining their ESA status.¹⁵⁵ Although never formally proposed, the plan generated considerable public attention. Environmental organizations and fishermen's associations attacked the plan as designed to undo salmon protection and reduce the need for habitat protection.¹⁵⁶

¹⁵¹ NOAA, Proposed Policy on the Consideration of Hatchery Production in Endangered Species Act Listing Determinations for Pacific Salmon and Steelhead (July 16, 2002) (on file with N.Y.U. Environmental Law Journal).

¹⁵² *Id.* at 6–7.

¹⁵³ *Id.* at 8.

¹⁵⁴ *Id.* at 1.

¹⁵⁵ *E.g.*, Preusch, *supra* note 61.

¹⁵⁶ Press Release, Save Our Wild Salmon, Representatives Call for NOAA Fisheries to Abandon Policy Change to List Hatchery Salmon with Wild Salmon (May 20, 2004), available at <http://www.wildsalmon.org/library/lib-detail.cfm?docID=331>; Press Release, Earthjustice, Bush Administration Poised to Strip Federal Protections from Pacific Salmon Stocks (Apr. 29, 2004), available at http://www.earthjustice.org/news/press/004/bush_administration_poised_to_strip_federal_protections_from_pacific_salmon_stocks.html.

Agriculture, power, and timber industry representatives greeted the decision with pleasure.¹⁵⁷ They viewed the approach as one that would produce “a lot more delistings than listings.”¹⁵⁸

Political appointees may have driven NMFS toward an approach calculated to produce delistings. For example, the Senior Advisor to NMFS’s Office of General Counsel at the time, Mark Rutzick, previously represented timber industry clients and helped develop the strategy of forcing the agency to count hatchery fish along with wild fish as a method of attacking ESA restrictions imposed on timber extraction.¹⁵⁹ Others affiliated with the agency fiercely opposed the plan. Such disagreements within the agency reflected broader concerns among the public.

Within a few weeks of reports that NMFS planned to count hatchery fish, the agency publicly released a letter to Congress “to correct recent erroneous accounts of how our hatchery policy will be used” and proclaiming that “[t]he central tenet of the hatchery policy is the conservation of naturally-spawning salmon and the ecosystems upon which they depend.”¹⁶⁰ Despite NMFS’s effort at “correction,” the agency was widely viewed as having seriously

¹⁵⁷ Egan, *supra* note 150 (reporting that, shortly after *Alesea*, timber-industry lawyer Mark Rutzick urged NMFS “to use hatchery fish more aggressively to restore salmon runs” because it “would ‘benefit timber-dependent communities and industries’”); Blaine Harden, *Hatchery Salmon to Count as Wildlife*, WASH. POST, Apr. 29, 2004, at A1. Russell Brooks of the Pacific Legal Foundation, who argued the plaintiff’s case in *Alesea*, was reported as saying that “using hatchery fish to get salmon off the threatened species rolls would ‘remove an unnecessary layer of government bureaucracy and regulation.’” Mark Freeman, *Bush Salmon Plan Criticized*, MAIL TRIB. (Medford, Or.), Apr. 30, 2004.

¹⁵⁸ Joe Rojas-Burke, *Protections Target Wild, Not Hatchery, Salmon*, OREGONIAN, May 28, 2004, at A01 (quoting Russ Brooks).

¹⁵⁹ Egan, *supra* note 150; see also Washington Trout, *Mark Rutzick Appointed Senior Legal Advisor to NOAA Fisheries*, WILD FISH RUNS, May 2003, available at <http://www.washingtontrout.org/WFRmay03.shtml> (writing about the appointment of Rutzick, the environmental organization’s director said, “For those that care deeply about salmon recovery in the northwest . . . this administration’s appointment should scare you to your core. In thirteen years of working in the environmental field, I’ve never seen an appointment that’s more concerning”); Craig Welch, *Bush Switches Nation’s Tack on Protecting Species*, SEATTLE TIMES, Sept. 27, 2004, at A1 (noting that Rutzick “frequently served as an attorney representing the American Forest Resource Council, a Northwest timber-industry group—particularly in lawsuits against the government over threatened salmon”).

¹⁶⁰ Letter from Conrad C. Lautenbacher, NOAA Administrator, to Congress, Concerning Proposals to Renew Listings of Northwest Salmon and Proposed Hatchery Policy Changes (May 14, 2004), available at <http://www.publicaffairs.noaa.gov/releases2004/may04/noaa04-r910a.html>.

considered including hatchery fish as the full equivalent of wild fish in listing determinations. This perception drove an extended debate over the appropriate role of hatchery fish, which focused primarily on two questions: what “science” required of NMFS and what “nature” the ESA protects.

B. “Science” and “Nature” as Rhetorical Tools

1. *Efforts to Hide Policy Behind Science*

Science is undoubtedly an important tool in understanding whether hatchery-bred salmon are an adequate substitute for naturally-occurring fish. Scientific work can describe the differences between the fish, describe their interactions, and make predictions concerning the effect of various management decisions. Partly because of this inherent importance, and partly because of the ESA’s requirement that listing decisions rest solely on the best available science, arguments following *Alsea* tended to employ a heated blend of professed scientific superiority and social policy appeals. Each side tried to portray its position as the more science-based view, reflecting the tendency in environmental and natural resources policy debates to draw on science to enhance legitimacy.¹⁶¹

For example, the plaintiffs’ principal lawyer in *Alsea*, Russell Brooks, sought to portray his position as the more “scientific” position and discredit his opponents by asking “whether opponents of including hatchery salmon in an ESU are more motivated by a desire to maintain federally imposed land use controls than by credible scientific evidence.”¹⁶² Similar portrayals of science as a determinative factor were advanced by wild fish advocates, such as NMFS Advisory Panel member Dr. Ransom Meyers who complained that the plan to count hatchery-bred fish was “a direct political decision . . . to go against the science.”¹⁶³ This type of

¹⁶¹ Dale Jamieson, for example, notes that “environmentalists have long been attracted to science [partly because it] is our great cultural legitimator.” DALE JAMIESON, *MORALITY’S PROGRESS: ESSAYS ON HUMANS, OTHER ANIMALS, AND THE REST OF NATURE* 216 (2002); see also A. Dan Tarlock, *The Futile Search for Environmental Laws Based on ‘Good Science,’* 1 INT’L J. BIOSCIENCES & L. 9, 9 (1996) (describing scientific arguments as “the most powerful explanation and justification for stringent laws to protect the public from toxic risks and preserve biodiversity”).

¹⁶² Lewallen & Brooks, *supra* note 61, at 738.

¹⁶³ Egan, *supra* note 150; see also Chef Boy Ari, *Flash in the Pan; Bush’s*

“scientized” policy argument fits within a broader pattern of interest groups on both sides of ESA debates condemning decisions as politics overriding science, with each side asserting that science supports its position.¹⁶⁴

Here, the advocates of wild fish protection, including scientists, more frequently misidentified the issue as scientific or, at least, implied that scientific information itself suggested the correct policy resolution. Some of the public opposition scientists expressed to the plan to count hatchery-bred fish reflected the ability of implicit value choices to shape scientific questions and conclusions¹⁶⁵ or perhaps even to create a “science charade” in which policy decisions are made to appear scientifically mandated.¹⁶⁶ In March 2004, for example, six renowned ecologists serving on a NMFS advisory panel assembled under President Clinton claimed that Bush administration officials demanded removal of their central recommendation—that wild and hatchery fish be separated for listing purposes—from the final report.¹⁶⁷ The ecologists publicly expressed their strong disagreement with the plan to count hatchery fish in the journal

Fishy Policy, MISSOULA INDEP., May 20, 2004, at 21.

¹⁶⁴ See Stephen M. Meyer, *Community Politics and Endangered Species Protection*, in PROTECTING ENDANGERED SPECIES IN THE UNITED STATES 138, 139 (Jason F. Shogren & John Tschirhart eds., 2001); see also Doremus, *Science Plays Defense*, *supra* note 4.

¹⁶⁵ See, e.g., ROBERT T. LACKEY, *NORMATIVE SCIENCE* 3 (2004), <http://www.epa.gov/wed/pages/staff/lackey/pubs/normative.pdf> (examining salmon science and politics and describing value-influenced science as “normative science”).

¹⁶⁶ See generally Wendy E. Wagner, *The Science Charade in Toxic Risk Regulation*, 95 COLUM. L. REV. 1613 (1995) (arguing that in the regulatory realm, obfuscation of policy choices by creating a “science charade” can be used to cover up political decisions concerning acceptable risk levels). *But see* Cary Coglianese & Gary E. Marchant, *Shifting Sands: The Limits of Science in Setting Risk Standards*, 152 U. PA. L. REV. 1255, 1257–58 (2004) (arguing that “science alone cannot provide a complete rationale for a policy decision” and that “agencies need to speak to the value choices inherent in their decision making”). The “science charade” concept has not frequently been applied to natural resources management regulation.

¹⁶⁷ Kenneth R. Weiss, *Action to Protect Salmon Urged*, L.A. TIMES, Mar. 26, 2004, at B1; UNION OF CONCERNED SCIENTISTS, *SCIENTIFIC INTEGRITY IN POLICY MAKING: FURTHER INVESTIGATION OF THE BUSH ADMINISTRATION’S MISUSE OF SCIENCE* 15–18 (2004) available at http://www.ucsusa.org/assets/documents/scientific_integrity/Scientific_Integrity_in_Policy_Making_July_2004_1.pdf.

Science.¹⁶⁸ Although their essay recognized that the role of hatcheries in restoring endangered salmon “is one of the most controversial issues in applied ecology,” the authors viewed the question of whether to count hatchery fish in determining the status of the population as an “overriding issue” not subject to such dispute.¹⁶⁹

At least some scientists within NOAA Fisheries also felt a deep concern akin to that expressed by ecologists on the advisory panel. A nine-year veteran biologist of the agency resigned, listing disregard of science on this issue as one of the reasons for his resignation in a letter:

I and other biologists are appalled at the nonsense we hear from high ranking agency officials, such as, ‘Just as natural habitat provides a place for fish to spawn and to rear, also hatcheries can do that.’ The scientific evidence is clear: hatcheries have contributed to the demise of natural populations of salmon.¹⁷⁰

The clarity of science on the issue became a consistent refrain of many wild fish advocates, as did their deep concern that the administration disregarded the science for policy reasons.¹⁷¹ This fit within a growing critique put forth by environmentalists that the Bush administration “led the most thorough and destructive campaign against America’s environmental safeguards in the past 40 years.”¹⁷² Even if this is so, it is not always accurate to

¹⁶⁸ Ransom A. Myers et al., *Hatcheries and Endangered Salmon*, 303 SCI. 1980, 1980 (2004) (“[T]he legal definition of an ESU must be unambiguous and must reinforce what is known biologically. Hatchery fish should not be included as part of an ESU.”).

¹⁶⁹ *Id.*

¹⁷⁰ Resignation letter of Michael Kelly (May 18, 2004), *available at* <http://www.peer.org/docs/noaa/kellyresignation.pdf>. The quotation in the excerpt of Kelly’s letter is from remarks made by D. Robert Lohn, NMFS’s Regional Administrator, as reported in Michael Milstein & Joe Rojas-Burke, *Policy Will Put Hatchery Fish in Salmon Count*, THE OREGONIAN, April 29, 2004.

¹⁷¹ The concerns of scientists expressed with regard to the hatchery salmon question represents just one aspect of the broad concern of many scientists regarding the Bush administration’s use or disregard of science for political ends. *E.g.*, UNION OF CONCERNED SCIENTISTS, SCIENTIFIC INTEGRITY IN POLICYMAKING: AN INVESTIGATION INTO THE BUSH ADMINISTRATION’S MISUSE OF SCIENCE (2004), *available at* http://www.ucsusa.org/documents/RSI_final_fullreport.pdf.

¹⁷² EMILY COUSINS ET AL., NATURAL RES. DEF. COUNCIL, REWRITING THE RULES (SPECIAL EDITION): THE BUSH ADMINISTRATION’S FIRST TERM ENVIRONMENTAL RECORD iv (2005); *see also* Patrick Parenteau, *Anything*

characterize the administration as disregarding *science*.¹⁷³

Despite the arguments in favor of wild fish protection advanced by many scientists acting as advocates,¹⁷⁴ the function of *science*, as a method of study, is simply to determine how these

Industry Wants: Environmental Policy Under Bush II, 14 DUKE ENVTL. L. & POL'Y F. 363, 363 (2004) ("My view is that this administration has compiled the worst environmental record of any administration in history."). For a severely critical analysis of the Bush record under the ESA, see WILLIAM SNAPE III ET AL., DEFENDERS OF WILDLIFE, SABOTAGING THE ENDANGERED SPECIES ACT: HOW THE BUSH ADMINISTRATION USES THE JUDICIAL SYSTEM TO UNDERMINE WILDLIFE PROTECTIONS (2003). A more general criticism is ROBERT F. KENNEDY, JR., CRIMES AGAINST NATURE: HOW GEORGE W. BUSH AND HIS CORPORATE PALS ARE PLUNDERING THE COUNTRY AND HIJACKING OUR DEMOCRACY 33 (2004), which describes the plan to count hatchery fish as an example of "reinterpret[ing] long-standing policies to limit government authority and facilitate polluter projects." Indeed, this critique now extends beyond the environmental community. See, e.g., Editorial, *An Endangered Act*, N.Y. TIMES, July 5, 2005, at A16 (citing salmon issues as an example); Michele Pearson, *Spitzer Outlines Environmental Policy*, LEGIS. GAZETTE (Albany, N.Y.), Apr. 3, 2006, at 1 (quoting then-New York Attorney General Eliot Spitzer during his successful gubernatorial campaign as saying, "George Bush is hands down the worst president on environmental issues this country has ever seen."). Vice President Cheney's role in environmental controversies, including the application of the ESA to Pacific salmon, has received similar condemnation. E.g. Jo Becker & Barton Gellman, *Leaving No Tracks*, WASH. POST, June 27, 2007, at A1 ("Because of Cheney's intervention, the government . . . declare[d] that there was no threat to the fish. What followed was the largest fish kill the West had ever seen, with tens of thousands of salmon rotting on the banks of the Klamath River").

¹⁷³ See, e.g., Doremus, *Science Plays Defense*, *supra* note 4, at 252. But see Marcilynn A. Burke, *Klamath Farmers and Cappuccino Cowboys: The Rhetoric of the Endangered Species Act and Why It (Still) Matters*, 14 DUKE ENVTL. L. & POL'Y F. 441, 513 (2004) (characterizing the attempt to count hatchery fish in listing decisions as "[y]et another example of the Bush Administration's dismissal of science").

¹⁷⁴ Many scientists calling for salmon restoration fall within the relatively new field of "conservation biology." This field has been described as "a social movement within the broader discipline of biology, and within fisheries biology as well." SCARCE, *supra* note 51, at 162. As the term "conservation biologist" implies, these scientists are also advocates for a particular policy position—conservation of biological diversity. See, e.g., Soc'y for Conservation Biology, <http://www.conbio.org/AboutUs/> (last visited Mar. 30, 2007) (this professional society, whose members are those "interested in the conservation and study of biological diversity," publishes the influential journal CONSERVATION BIOLOGY, among other activities). A pre-existing policy orientation need not effect the quality of scientific work (indeed, conservation biology may simply make explicit the type of policy motivation that underlies most socially significant scientific research), but distinguishing between objective scientific information and policy argument in the recommendations of conservation biologists can be difficult. This can make value-based policy goals appear scientifically mandated, at least to a casual observer or in the hands of an advocate.

social goals can be met *if* they are adopted.¹⁷⁵ Science does not answer the basic question of what elements of the world we seek to protect with environmental laws.¹⁷⁶

The limits of science in administrative decision-making in general, and in natural resources management decisions in particular, are now widely recognized.¹⁷⁷ Science cannot uncover an objective definition of the “nature” that the law seeks to protect and explain how salmon fit within it. Society must use scientific tools and knowledge within an understanding of “nature” derived from value-based thinking not controlled by science.¹⁷⁸ Although scientists may have a particularly rich understanding of the likely impact of various policy options, the policy choice itself is not a scientific question. In the salmon hatchery issue, the inadequacy of science to resolve the core value issue can be understood in terms of the questions that each side asks. Rather than questioning whether wild and hatchery-bred salmon warrant different levels of protection, as the *Alsea* plaintiffs and many in the Bush administration did, those in favor of protecting wild fish generally focused on the impact that hatchery-bred fish may have on wild salmon.¹⁷⁹ These differing focuses arise from different values, not

¹⁷⁵ See Robert T. Lackey, *Salmon and the Endangered Species Act: Troublesome Questions*, 19 RENEWABLE RESOURCES J. 1, 6 (2001) (“[T]he salmon ‘problem’ is predominantly and ultimately an issue of societal choice, not scientific adjudication.”), available at <http://www.epa.gov/wed/pages/staff/lackey/pubs/trouble.pdf>; cf. Ruckelshaus et al., *supra* note 35, at 665 (“Although scientists sometimes forget this point, it is not their job to recommend a recovery strategy to policy-makers.”).

¹⁷⁶ Sociologist Rik Scarce, for example, noted after an extensive study of salmon conservation, “[p]erhaps . . . we are encountering the limits of science. We have come to the realization that science is not Nature, nor even a reflection of it [I]t is *we* who are reflected in Nature.” SCARCE, *supra* note 51, at 198.

¹⁷⁷ Sheila Jasanoff & Marybeth Long Martello, *Conclusion: Knowledge and Governance*, in EARTHLY POLITICS: LOCAL AND GLOBAL IN ENVIRONMENTAL GOVERNANCE 337 (Sheila Jasanoff & Marybeth Long Martello eds., 2004) (“[W]e can look at the decade of the 1990s as a long march toward doubt and uncertainty . . . [because] awareness grew in many quarters that science is neither complete nor univocal and that its ability to bridge deep ideological and normative divisions is correspondingly limited.”); see also David P. Robertson & R. Bruce Hull, *Beyond Biology: Toward a More Public Ecology for Conservation*, 15 CONSERVATION BIOLOGY 970, 972 (Aug. 2001) (“Science is increasingly accepted as both partial and incomplete, a sometimes privileged but forever limited body of knowledge.”); Tarlock, *supra* note 161, at 16 (“Science’s use is ultimately a political decision.”).

¹⁷⁸ See, e.g., Meyer, *supra* note 164, at 139–40.

¹⁷⁹ Doremus, *Science Plays Defense*, *supra* note 4, at 277. Professor Doremus

from scientific evidence.

The hatchery salmon debate reflects not only the limits of science in natural resources policy, but also the growth of public and expert awareness of these limits. With both sides claiming that science leads to their conclusion, neither argument is particularly convincing. Newspaper coverage, while reporting science-based arguments, also laid bare the political nature of the debate.¹⁸⁰ As discussed below, the need for non-scientific resolution was ultimately supported by NMFS's final hatchery policy in 2005, which states explicitly that it seeks to restore natural salmon runs, without attempting to portray this choice as scientifically mandated.¹⁸¹

2. *The Crux of the Issue: A Conflict of Values*

The policy debate over the status of hatchery-bred salmon involved a conflict of social values at two levels. The hatchery issue served partly as a proxy for debate over the practical impacts flowing from listing Pacific salmon on the ESA. At the same time, the two basic policy options were manifestations of incongruent understandings of what qualifies as a species worthy of ESA protections. In this sense, the issue engendered something that is too often missing from environmental policy debates—a discussion of core concepts underlying the law.¹⁸²

a. *Salmon as Proxy*

Broader environmental policy positions informed and perhaps shaped the perceptions of participants who focused on either defending or attacking the separation of wild and hatchery fish. The positions embraced by particular groups in the hatchery

uses the different scientific questions posed by the two sides of the hatchery salmon debate in support of her conclusion that whatever success environmental advocates may have previously had by scientizing administrative policy decisions, actions under the Bush administration have demonstrated that it is no longer a viable strategy. *Id.* The ability to enlist science for either side of the hatchery salmon debate provides potent support for this thesis. *Id.*

¹⁸⁰ *E.g.*, Editorial, *Salmon and Science*, N.Y. TIMES, Oct. 9, 2004, at A18; Chef Boy Ari, *supra* note 163.

¹⁸¹ *See infra* Part IV.C.i.

¹⁸² *See, e.g.*, Flournoy, *supra* note 12, at 67–71 (discussing the need for greater attention to underlying theories supporting environmental law); *see also* A. Dan Tarlock, *Is There a There There in Environmental Law?*, 19 J. LAND USE & ENVTL. LAW 213, 241–42 (2004).

salmon debate generally appear tied to their economic interests or their pre-orientation on environmental issues.¹⁸³

The concern underlying the case advanced by the *Aalsea* plaintiffs was apparently that because of salmon listings, “increasingly severe restrictions would limit existing and future land uses.”¹⁸⁴ As in other issues arising under the ESA, many people who make their living through use of natural resources see ESA protection of salmon as a threat to their way of life.¹⁸⁵ This concern represents a point of view implicated by much of natural resources law. The question, from that point of view, can be framed as whether human activities should be curtailed to protect wild salmon runs when hatcheries can continue to stock the rivers despite habitat degradation.

On the other side of the issue, fishermen generally see protection of salmon as necessary to sustain their way of life.¹⁸⁶ Much of the interest that society at large may have in protecting wild salmon is likely connected to a desire to compel broader ecosystem conservation. Most listing decisions are important partially because they serve as surrogates for ecosystem-wide issues.¹⁸⁷ Mandating recovery of wild salmon can provide strong leverage for environmental interests and others to compel large-scale ecosystem protection and restoration, as similar protection has done in other contexts.¹⁸⁸ This fact likely underlies many of

¹⁸³ This point is abundantly, albeit anecdotally, illustrated by the interviewees in the documentary *Troubled Waters: The Dilemma of Dams* by Beth and George Gage. Cf. Amy Whritenour Ando, *Interest Group Behavior and Endangered Species Protection*, in PROTECTING ENDANGERED SPECIES IN THE UNITED STATES 91, 102 (Jason F. Shogren & John Tschirhart eds., 2001) (stating that empirical evidence suggests that “[o]pposition is greater for proposed species that are known to be directly in conflict with development”).

¹⁸⁴ Lewallen & Brooks, *supra* note 61, at 737.

¹⁸⁵ Professor Doremus makes this point in regard to efforts to reintroduce wildlife in the American West under the ESA. Doremus, *Wild*, *supra* note 12, at 35–38. In the context of salmon, this point was perhaps most readily apparent in the controversy over water that unfolded in the Klamath Basin. For an analysis of that controversy, see Holly Doremus & A. Dan Tarlock, *Fish, Farms, and the Clash of Cultures in the Klamath Basin*, 30 *ECOLOGY L.Q.* 279 (2003).

¹⁸⁶ SCARCE, *supra* note 51.

¹⁸⁷ Houck, *supra* note 92, at 299–301; see also Amanda R. Garcia, Note, *The Sage Grouse Debate: Cost-Benefit Analysis and the Discourse of the Endangered Species Act*, 14 *N.Y.U. ENVTL. L.J.* 572, 593 (2006) (“[E]nvironmentalists viewed the sage grouse as the proverbial ‘canary in the coal mine’ for sagebrush ecosystems.”).

¹⁸⁸ For example, listed species can force economic interests to reach

the calls for protection of wild fish.¹⁸⁹

b. *What “Nature” Warrants Protection?*

An exchange captured by the New York Times illustrates the core of the disagreement between wild-fish advocates and proponents of counting hatchery fish. In response to Earthjustice attorney Patti Goldman’s comment that equating hatchery fish with wild fish was like “saying that lions in zoos are exactly the same as lions in the Serengeti,” Russell Brooks, plaintiffs’ lawyer in *Alea*, responded that a lion in a zoo “is just as wild as the lion in the jungle. It’s the same species.”¹⁹⁰

Inherent beliefs about the relationship between humanity and nature, and differing perspectives of what is “natural,” play a critical role in shaping perception of the hatchery salmon issue. Resolving the debate generally required embracing either a conception of nature that includes human-sustained hatchery populations as “natural” or restricting the concept of nature to only populations that sustain themselves without direct human intervention. In this way, the hatchery salmon debate implicates some of the most fundamental value questions underlying environmental law.¹⁹¹ One wild salmon advocate, for example, argued that the “hatchery’s call is that we can circumvent nature and still have our fish . . . [but] you can’t replace the natural

compromises with environmental interests in order to continue their activities. Andrew Long, *Two Prongs of Public Interest Lawyering Under the Endangered Species Act: Building a Cooperative Strategy from Litigation and Collaborative Efforts*, 35 ENVTL. L. REP. 10,690, 10,697–98 (2005); see also Jody Freeman & Daniel A. Farber, *Modular Environmental Regulation*, 54 DUKE L.J. 795, 857 (2005).

¹⁸⁹ See, e.g., Rahr, *supra* note 23, at 1–3.

¹⁹⁰ Sam Howe Verhovek, ‘Saving’ Wild Salmon’s Bucket Born Cousins, N.Y. TIMES, Feb. 4, 2002, at A1; see also Joe Rojas-Burke, *Salmon Plan May Add Artificial Twist to Species Protection*, OREGONIAN, May 13, 2004, at A1.

¹⁹¹ Similar problems also arise elsewhere in ESA implementation. Examples include whether the red wolf and other hybrids constitute species, determination of some species’ range, and the desirability of reintroduction to its historical ranges. See, e.g., C. Alexander Brownlow, *Molecular Taxonomy and the Conservation of the Red Wolf and Other Endangered Carnivores*, 10 CONSERVATION BIOLOGY 390 (1996); see also Doremus, *Science Mandate*, *supra* note 7, at 420–21 (describing the grey wolf and Pacific salmon as presenting similar types of problems); Daniel J. Rohlf, *Section 4 of the Endangered Species Act: Top Ten Issues for the Next Thirty Years*, 34 ENVTL. L. 483, 511–20 (2004); see also *infra* Part V.A.

ecosystem with industrial technology.”¹⁹²

Concepts of what constitutes “nature” or some facet of nature are not universal and immutable. For example, social science research suggests that urbanites and people living in rural areas have different perceptions of what constitutes “wilderness.”¹⁹³ Likewise, the idea of “wilderness” has changed over time, showing that the concept is not fixed and objective, but subject to varying perceptions that will impact social policy.¹⁹⁴ Increasing biological understanding of relationships between organisms challenges the common-sense understanding of what is “natural.”¹⁹⁵ The hatchery salmon issue suggests a similar legal-philosophical question of social values.¹⁹⁶

A view that naturally-occurring fish require protection irrespective of abundant hatchery-bred fish perceives as critical the human intervention necessary to sustain hatchery populations. It necessarily rejects a wholly anthropocentric-utilitarian view of nature and suggests an intrinsic value of the “wild.”¹⁹⁷ This view finds a degree of support in western thought dating back to at least John Stuart Mill’s conception of nature as “only what happens without the agency, or without the voluntary and intentional

¹⁹² David Foster, *In Oregon, Hatcheries Spawn a Salmon Struggle*, WASH. POST, Apr. 21, 2002, at A6 (quoting Bill Bakke of the Native Fish Society of Oregon).

¹⁹³ See generally Allison R. Lutz et al., *Wilderness: Rural and Urban Attitudes and Perceptions*, 31 ENV’T & BEHAV. 259 (1999).

¹⁹⁴ The classic study is RODERICK FRAZIER NASH, *WILDERNESS AND THE AMERICAN MIND* (4th ed. 2001); see also William Cronon, *The Trouble with Wilderness; or, Getting Back to the Wrong Nature*, in UNCOMMON GROUND: TOWARD REINVENTING NATURE 69 (William Cronon ed., 1995).

¹⁹⁵ See generally JAN SAPP, *WHAT IS NATURAL?* (1999) (examining the understanding of and reaction to twentieth-century starfish population explosions and their resulting destruction of coral reefs). Another example that raises the issue of what is “natural” is the definition of a wetland. See, e.g., T.E. DAHL, U.S. FISH & WILDLIFE SERV., *STATUS AND TRENDS OF WETLANDS IN THE CONTERMINOUS UNITED STATES 1998 TO 2004*, at 21 (2006) (adopting a definition of wetlands that would include wholly human-created wetlands); see also *All Things Considered: Interior Department Claims Wetlands Gain* (NPR radio broadcast Mar. 30, 2006), available at <http://www.npr.org/templates/story/story.php?storyId=5313694> (follow “Listen” hyperlink) (discussing whether man-made ponds should be equated with natural wetlands).

¹⁹⁶ See SCARCE, *supra* note 51, at 102–07 (describing different conceptions of hatchery salmon among fisheries biologists).

¹⁹⁷ See *id.* at 189. However, it is not necessary to recognize an intrinsic value in “wild” species to favor protecting self-sustaining populations. See *infra* Part V.B.

agency, of man.”¹⁹⁸ In this sense, hatchery-bred salmon are clearly “artificial.” The other side of the debate necessarily embraces a broader conception of nature—one that looks simply to how many fish are in the rivers, not their independent ability to propagate.¹⁹⁹

Viewed in this light, the resolution of the hatchery-salmon question must be understood as embodying a social values determination. While the earlier 1993 policy might be seen as disguising the agency’s policy preference in scientific garb, the intense public attention to the issue following the *Alsea* decision made a repeat of any such subterfuge unlikely. An express emphasis on wild salmon in final 2005 policy, which followed extended public debate and several draft policies, serves as a response to public opinion and provides some explanation for accepting one set of values as a more accurate statement of the law.

C. *The New Hatchery Policy*

Although much of the criticism of the plan to count hatchery-bred fish had a scientific veneer, its function was undoubtedly political²⁰⁰ and, at least to some extent, effective. The plan was never formally announced. Instead, a modified proposal was announced in late May 2004, along with proposals to continue to protect 27 ESUs of Pacific salmon under the ESA.²⁰¹ The modified policy proposal, although leaving significant discretion to the agency, promised greater protection for naturally-occurring populations than the earlier policy proposal (reported in April) likely would have.²⁰²

¹⁹⁸ JOHN STUART MILL, *Nature, in THREE ESSAYS ON RELIGION* 3 (Greenwood Press 1969) (1874).

¹⁹⁹ This also finds support in Mill’s work. He advanced two possible definitions. *Id.*

²⁰⁰ See, e.g., Save Our Wild Salmon, *supra* note 156 (reporting that “[t]oday more than 70 Representatives from both sides of the aisle . . . called on NOAA Fisheries to abandon their current proposed policy to include hatchery fish when deciding federal protections for wild salmon”).

²⁰¹ Proposed Policy on the Consideration of Hatchery-Origin Fish in Endangered Species Act Listing Determinations for Pacific Salmon and Steelhead, 69 Fed. Reg. 31,354 (June 3, 2004); Press Release, NOAA Fisheries, NOAA Fisheries Expresses Continued Commitment to Pacific Salmon Recovery with New Hatchery Policy (May 28, 2004), *available at* <http://www.publicaffairs.noaa.gov/releases2004/may04/noaa04-r144.html>.

²⁰² PLF immediately described the proposed policy as a “serious mistake” and threatened to sue if NMFS did not recognize the error. Press Release, Pac. Legal

1. *Final Policy*

In June 2005, after an extended comment period, NMFS adopted a final policy on the role of hatchery-bred fish in listing determinations.²⁰³ The agency stated that the final policy “reinforces our commitment to protect naturally spawning salmon and their ecosystem” using carefully managed hatchery programs as “a key component of our overall salmon recovery efforts.”²⁰⁴ Although the policy contains a strong dose of genetic and other scientific analysis in determining the membership of ESUs, it suggests that the question of whether hatchery-bred salmon satisfy the ESA is not scientific.²⁰⁵ Instead, the policy outlines an approach that seeks to balance conservation of naturally-reproducing populations with maintenance of the fishing benefits that hatchery-spawned fish provide.

The policy provides multiple avenues for protecting only wild fish, skirting *Alsea*'s holding and attempting to maintain scientific integrity. Although NMFS maintained the option of including hatchery fish in ESUs because “important genetic resources may reside in hatchery stocks,”²⁰⁶ the agency also posited that “[i]t may be appropriate to consider the threats faced by an ESU (such as risks posed by artificial propagation) when determining what constitutes a species under the ESA.”²⁰⁷ NMFS signaled that the focus on naturally-spawning fish may be sustained by excluding hatchery stocks from the ESU, rather than including and choosing

Found., Bush Administration Salmon Policy Puts Politics Before Science, the Law and People (May 28, 2004), available at <http://www.pacificlegal.org/> (follow “Media Resources” hyperlink; then follow “News Releases” hyperlink, then scroll down to the date). Environmental organizations also criticized the proposal, however. See, e.g., Action Alert, Or. Natural Res. Council, Speak Out Against Bush’s Wild Salmon Extinction Plan (Nov. 8, 2004) (on file with N.Y.U. Environmental Law Journal).

²⁰³ Policy on the Consideration of Hatchery-Origin Fish in Endangered Species Act Listing Determinations for Pacific Salmon and Steelhead, 70 Fed. Reg. 37,204, 37,204–06 (June 28, 2005) (to be codified at 50 C.F.R. §§ 223–224). As discussed in Section IV.E, *infra*, the policy was set aside in June 2007.

²⁰⁴ Press Release, NOAA, NOAA Announces Hatchery Policy, Listing Determinations for 16 Salmon Species (June 16, 2005), available at <http://www.nwr.noaa.gov/Newsroom/Archives/2005/upload/06-16-2005.pdf>.

²⁰⁵ See Policy on the Consideration of Hatchery-Origin Fish in Endangered Species Act Listing Determinations for Pacific Salmon and Steelhead, 70 Fed. Reg. at 37,207–08 (suggesting that hatchery origin is an “inherently non-biological consideration”).

²⁰⁶ *Id.* at 37,208.

²⁰⁷ *Id.*

not to list them. Similarly, in response to comments that *Alsea* required that risk to a given ESU be based on abundance of the ESU as a whole, the agency emphasized that abundance is not the sole listing criteria.²⁰⁸ Thus, even if hatchery stocks are included in the ESU, their sheer number may not be sufficient to preclude listing of the ESU under the 2005 policy.

The policy's basic test for determining ESU membership of hatchery fish is whether they have "a level of genetic divergence relative to the local natural population(s) that is no more than what occurs within the ESU."²⁰⁹ Where hatchery fish meet that test, they would be included in the ESU, considered in the listing determination, and included in any ESA listing that occurs.²¹⁰ However, "NMFS will apply this policy in support of the conservation of naturally-spawning salmon and the ecosystems on which they depend"²¹¹ and, the policy explains, features of hatchery management can determine whether hatchery-spawned fish advance or detract from the goal of conserving natural populations.²¹² The policy provides for harvest of excess listed hatchery fish "where appropriate,"²¹³ which provided a final, albeit legally questionable, escape valve for preventing hatchery fish from undermining protection of wild fish.

In response to independent expert reviewers' concerns that the

²⁰⁸ *Id.* at 37,212.

²⁰⁹ *Id.* at 37,215.

²¹⁰ *Id.* This point was similarly stated in the proposed policy, in which NMFS stated the approach was unlikely to produce "an appreciably different threshold for the inclusion of hatchery stocks in an ESU" than the 1993 interim policy. Proposed Policy on the Consideration of Hatchery-Origin Fish in Endangered Species Act Listing Determinations for Pacific Salmon and Steelhead, 69 Fed. Reg. 31,354, 31,358 (June 3, 2004).

²¹¹ Policy on the Consideration of Hatchery-Origin Fish in Endangered Species Act Listing Determinations for Pacific Salmon and Steelhead, 70 Fed. Reg. at 37,215.

²¹² *Id.* The proposed policy stated that consideration of these features "requires the application of professional judgment." Proposed Policy on the Consideration of Hatchery-Origin Fish in Endangered Species Act Listing Determinations for Pacific Salmon and Steelhead, 69 Fed. Reg. at 31,358. The final policy identifies four "key attributes" of ESUs that should be considered in listing determinations: "abundance, productivity, spatial distribution, and genetic diversity." Policy on the Consideration of Hatchery-Origin Fish in Endangered Species Act Listing Determinations for Pacific Salmon and Steelhead, 70 Fed. Reg. at 37,215.

²¹³ Policy on the Consideration of Hatchery-Origin Fish in Endangered Species Act Listing Determinations for Pacific Salmon and Steelhead, 70 Fed. Reg. at 37,215-16.

proposed policy de-emphasized the need to protect native, naturally-occurring populations and the ecosystems upon which they depend, the agency “agree[d] that the intent of the ESA is to conserve natural self-sustaining populations and functioning ecosystems.”²¹⁴ Indeed, NMFS clarified vague language in the proposed policy that described stable natural populations as “reduc[ing] the risk of extinction of the ESU;”²¹⁵ the final policy requires that hatchery fish be considered “in the context of their contributions to conserving natural self-sustaining populations.”²¹⁶ Further, NMFS stated that it will “apply this policy in support of the conservation of naturally-spawning salmon and the ecosystems on which they depend.”²¹⁷ On its face, then, the policy aims to preserve genetically distinct naturally-propagating populations—the role of hatchery fish is to be determined largely by their ability to bolster such populations.

2. *Impact of the Final Policy*

The practical impact of the changes from the 1993 policy has been minimal. Shortly after the proposed policy was released in June 2004, NMFS released a proposed application of the policy that suggested the changes would have little impact on listings.²¹⁸ It concluded that of twenty-seven previously listed ESUs evaluated, four warranted listing as endangered and the other twenty-three warranted listing as threatened.²¹⁹ Thus, even though 162 hatchery populations would be included in the 27 ESUs, the proposed listing determinations were essentially unchanged.

At approximately the same time it released the final hatchery policy, NMFS issued a final rule containing listing determinations for sixteen of the ESUs evaluated in the 2004 proposed policy.²²⁰

²¹⁴ *Id.* at 37,207–08.

²¹⁵ Proposed Policy on the Consideration of Hatchery-Origin Fish in Endangered Species Act Listing Determinations for Pacific Salmon and Steelhead, 69 Fed. Reg. at 31,358.

²¹⁶ Policy on the Consideration of Hatchery-Origin Fish in Endangered Species Act Listing Determinations for Pacific Salmon and Steelhead, 70 Fed. Reg. at 37,215.

²¹⁷ *Id.*

²¹⁸ Proposed Listing Determinations for 27 ESUs of West Coast Salmonids, 69 Fed. Reg. 33,102 (June 14, 2004).

²¹⁹ *Id.* at 33,157.

²²⁰ Final Listing Determinations for 16 ESUs of West Coast Salmon, and Final 4(d) Protective Regulations for Threatened Salmonid ESUs, 70 Fed. Reg.

Of the sixteen, twelve were listed as threatened and four were listed as endangered.²²¹ NMFS concluded that 132 hatchery programs were associated with the 16 ESUs and, in accord with *Alsea*, listed hatchery populations were included within any listed ESU.²²² However, the agency concluded that “[t]he *Alsea* ruling does not require us to implement protective regulations equally among components of threatened ESUs.”²²³ With this understanding of the legal framework, NMFS determined that:

Hatchery production that is surplus to conservation needs may . . . create population pressures that cannot be relieved except through harvest of the surplus. An alternative approach to conservation would be to simply produce fewer hatchery fish. While reducing hatchery production might be another option for addressing this threat, the hatchery production itself is in many cases important for redressing lost treaty harvest opportunities (as well as meeting other societal values). Allowing the continued production of hatchery fish for harvest, and not prohibiting the take of listed marked hatchery fish, balances the conservation needs of listed ESUs against other Federal obligations.²²⁴

Although a few ESUs were shuffled from threatened to endangered or vice versa, the status of ESUs remained pretty much the same as they had been under the 1993 interim policy called into question by *Alsea*.²²⁵

37,160 (June 28, 2005). NMFS concluded that disagreement concerning data precluded a final determination for the other 11 ESUs assessed in the 2004 proposed policy, including the Oregon Coast coho ESU. *Id.* at 37,160.

²²¹ *Id.* at 37,191.

²²² *Id.*

²²³ *Id.* at 37,166.

²²⁴ *Id.* at 37,167.

²²⁵ In January 2006, NMFS announced that it was withdrawing a proposed listing for the Oregon Coast coho ESU—the ESU that was the subject of *Alsea*. Withdrawal of Proposals to List and Designate Critical Habitat for the Oregon Coast Evolutionarily Significant Unit (ESU) of Coho Salmon, 71 Fed. Reg. 3033 (Jan. 19, 2006). Reaction to the announcement was mixed. *See, e.g.*, Blaine Harden, *Species of Oregon Coast Salmon Won't Be Listed as Endangered*, WASH. POST (Jan. 18, 2006) at A5. In defining the ESU, NMFS concluded that five hatchery stocks should be included. Withdrawal of Proposals to List and Designate Critical Habitat for the Oregon Coast Evolutionarily Significant Unit (ESU) of Coho Salmon, 71 Fed. Reg. at 3043. Based on comments received from the Oregon Department of Fish and Wildlife, NMFS excluded one hatchery population that it had previously included and included the progeny of one hatchery no longer in operation. The withdrawal of the proposal to list does not appear linked to the inclusion of hatchery fish in the ESU, however. Instead, the

Nonetheless, the potential existed for consideration of hatchery fish to influence listing determinations under the 2005 policy, as illustrated by NMFS's January 2006 determination of the status of the Upper Columbia River steelhead ESU. The agency considered the ESU as part of a status review of 10 steelhead populations.²²⁶ NMFS determined that six hatchery-bred populations were members of the ESU based on application of the 1991 ESU policy.²²⁷ Although agency scientists recommended designation as "endangered" based on assessment of natural populations, the agency listed the ESU as "threatened" upon assessing the hatchery populations of the ESU. NMFS noted that the hatcheries associated with the ESU utilize "extensive monitoring and evaluation efforts to continually evaluate the extent and implications of any genetic and behavioral differences" between the populations.²²⁸ The agency concluded that "hatchery programs collectively mitigate the immediacy of extinction risk for the Upper Columbia River steelhead DPS in the short term," although "the contribution of these programs in the foreseeable future is uncertain."²²⁹ The Federal Register notice states that the hatchery fish have increased the overall abundance of the ESU members, but notes concern that in some areas the high proportion of hatchery fish within the ESU "may pose risks to the DPS's diversity by decreasing local adaptation."²³⁰ On the whole, the agency determined that the short term benefits of the hatchery populations warranted downgrading the ESU's status from endangered to threatened.²³¹

decision rests on an assessment of the impact of recovery measures taken under the Oregon Plan for Salmon and Watersheds. *Id.* at 3033–34. As noted above, NMFS had previously concluded that the Oregon Plan would provide adequate protection for the ESU, but its decision not to list on that basis was vacated in *Or. Natural Res. Council v. Daley* because it relied on future and voluntary efforts. 6 F. Supp. 2d 1139 (D. Or. 1998); *see also supra* Part III.D. Rather than reflecting a change wrought by *Alsea* and the final hatchery policy, the decision to withdraw the proposed listing for the Oregon Coast ESU reflects successful implementation of measures that NMFS had previously determined would adequately protect the ESU.

²²⁶ Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead, 71 Fed. Reg. 834 (Jan. 5, 2006).

²²⁷ *Id.* at 849.

²²⁸ *Id.* at 854.

²²⁹ *Id.*

²³⁰ *Id.*

²³¹ *Id.* at 834, 854–55. This determination was set aside by a district court in June 2007, as discussed in Section IV.E, *infra*.

To the extent that *Alsea* represented an effort to undermine salmon listings, it has largely failed. Particularly when the hatchery policy is read in conjunction with listing determinations that allow take of listed hatchery-bred fish, NMFS's value choice in the face of statutory ambiguity seems clear. Given the extended debate within the agency and among the public following *Alsea*, the 2005 policy's explicit emphasis on protection of natural fish can be understood to reflect a social preference for maintaining self-sufficient species. Nonetheless, the 2005 hatchery policy created a framework for analysis that increases the potential for hatchery populations to reduce the listing protections of naturally-spawning ESU. Therefore, its overall practical impact was to provide the agency greater discretion in each listing decision to consider possible positive effects of hatchery salmon on otherwise imperiled naturally-spawning members of an ESU.

D. Political Responses

Reaction to the final hatchery policy was generally negative from all sides, with some cautious optimism from environmental interests.²³² Despite explicit statements in the final hatchery policy that identify its goal as restoration of wild runs, some environmental organizations have decried it as paving the way for extinction because it requires that some hatchery populations be included in ESUs.²³³ A coalition of environmental groups promptly commenced a legal challenge to the 2005 policy.²³⁴

²³² Warren Cornwall, *Hatchery Salmon Will be Counted in Runs*, KNIGHT-RIDDER/TRIB. BUS. NEWS, (Wash., D.C.) June 17, 2005, at 1; *131 Strains of Hatchery Fish Now Protected: The Salmon Can Still Be Harvested, Though*, L.A. TIMES, June 17, 2005, at A33; Susan Chambers, *Hatchery Policy Wins Few Hearts*, NAT'L FISHERMAN, Apr. 2005, at 18.

²³³ Earthjustice described the final policy as the "latest weapon in [the Bush administration's] ongoing effort to undermine the Endangered Species Act and open wild salmon habitat to development." Press Release, Earthjustice, Bush Administration Takes Next Step to Reduce Wild Salmon Protections (June 16, 2005), available at http://www.earthjustice.org/news/press/005/bush_administration_takes_next_step_to_reduce_wild_salmon_protections.html; see also Press Release, Pac. Rivers Council, Federal Salmon Extinction Policy Announced (June 16, 2005), available at http://www.pacrivers.org/article_view.cfm?ArticleID=1209&RandSeed=57913. A more comprehensive analysis from the environmentalist perspective is Patti Goldman, *The Salmon and Steelhead Listings—Learning to Count All over Again* (January 2006), available at http://www.nativefishsociety.org/conservation/biblio/history_and_solutions/special_contributions/historical/ESASalmon.htm.

²³⁴ See *Trout Unlimited v. Lohn*, No. CV06-0483-JCC, 2007 U.S. Dist.

Nonetheless, environmental organizations do appear to recognize that consideration of some hatchery stocks in listing decisions may accord with environmental goals, provided that the emphasis remains on protecting wild fish.²³⁵ At the same time, the PLF filed suit alleging that the policy illegally allows the agency to distinguish between wild and hatchery fish.²³⁶ In addition, PLF, on behalf of property-rights organizations, intervened in a major suit commenced by environmental organizations.²³⁷

The rhetoric surrounding the salmon hatchery debate reflects broader political issues. Environmental groups, although apparently not entirely unhappy with the final hatchery policy, feared that its method of including hatchery-bred salmon in ESUs could allow opponents of listings or a results-oriented administration to avoid listings that would be required under the 1993 policy.²³⁸ The PLF, and presumably similar interests, is disappointed that the re-consideration of hatchery fish compelled by *Alsea* did not achieve significant changes in the listings of ESUs. At least publicly, the Bush administration appears to have abandoned any effort to use hatchery stocks as a vehicle for reducing salmon listings.²³⁹

LEXIS 42858 (W.D. Wash. June 13, 2007), discussed in section IV.E, *infra*.

²³⁵ Earthjustice, despite criticizing the final hatchery plan, has also noted that “In some cases hatchery fish are similar to their wild cousins. . . . The question of identifying which salmon stocks are . . . deserving of ESA protections is currently unresolved.” Earthjustice, Background: Salmon Protection in the Northwest, http://www.earthjustice.org/library/background/salmon_protection_in_the_northwest.html (last visited Mar. 29, 2007).

²³⁶ The PLF contends that the final policy “violate[s] the ESA and contradict[s] . . . *Alsea*.” Press Release, Pac. Legal Found., PLF Files Lawsuit Challenging 16 Salmon ESA Listings Throughout the West (Dec. 13, 2005), available at <http://www.pacificlegal.org> (follow “Media Resources” hyperlink; then follow “News Releases” hyperlink, then scroll down to the date). PLF has also challenged specific listing decisions. See Pac. Legal Found., Insisting That Fish Not Be Seen as Endangered When They Aren’t, <http://www.pacificlegal.org/?mvcTask=topic&id=2&category=14&project=&case=627> (last visited June 24, 2007).

²³⁷ *Trout Unlimited v. Lohn*, No. CV06-0483-JCC, 2007 U.S. Dist. LEXIS 42858 (W.D. Wash. June 13, 2007).

²³⁸ See Goldman, *supra* note 233, at 2, 13 (concluding that in 2006 the law “is remarkably close to where we started” before *Alsea*, but “special interests . . . are looking for loopholes that might make the ESA safeguards evaporate”).

²³⁹ The administration’s more recent remarks concerning Pacific salmon struck a remarkably different tone than the 2004 plan to count hatchery fish. The chairman of the White House Council on Environmental Quality, James L.

E. Trout Unlimited v. Lohn

In June 2007, just before this article went to print, a district court in Washington invalidated the 2005 hatchery policy and reinstated the 1993 policy in a careful and well-reasoned decision that revealed much greater attention to scientific detail than the *Alsea* decision.²⁴⁰ The court firmly concluded that agency policies and listing determinations must be assessed against the goal of achieving “viability of naturally self-sustaining populations in their naturally-occurring habitat” because “the purpose of the ESA is to promote populations that are self-sustaining without human interference.”²⁴¹ Reasoning that “[i]f the statute did not aspire to naturally self-sustaining populations . . . , it would be permissible under the ESA to capture and permanently raise [protected] species in zoos,” the court noted that “the statute mentions artificial propagation just once” and concluded that “artificial propagation is a temporary measure.”²⁴²

Not surprisingly, *Trout Unlimited*'s discussion of *Alsea* suggests that the earlier case was wrongly decided. The *Trout Unlimited* court notes that *Alsea*'s central conclusion—that distinctions below the ESU level are impermissible—rests entirely

Connaughton, announced a new initiative: “ending outdated hatchery programs and stopping harvest levels and practices that impede recovery of wild, endangered and threatened salmon.” James L. Connaughton, Chairman, Council on Env'tl. Quality, Columbia River Salmon Recovery: A Comprehensive and Collaborative Management Strategy 1 (Jan. 25, 2006) available at http://www.fishfirst.org/picts/documents/JLC_Salmon_Speech_1_25_06.pdf.

Connaughton, who defended and lobbied on behalf of the power industry before assuming the CEQ chair, presented the initiative as one that requires sustained investment in hydropower projects and reduction in fishing. Although the new view of hatcheries does express a sensible recovery-oriented perspective (“[w]hat we began decades ago as a crutch for our harvest demand must become a vital aid in our determination for recovery”), the policy shift may be motivated more by a desire to distract attention from recent criticism of dams than by an awakening to the potentially deleterious effect of hatcheries. *Id.* at 5. This conclusion has not escaped interested parties. See, e.g., *A Call to Cut Salmon Catch*, SEATTLE POST-INTELLIGENCER, Jan. 26, 2006, at B1 (quoting Glen Spain who called the policy announcement “a diversionary tactic”). On the other hand, in accord with this approach, NMFS has undertaken an extensive hatchery review program designed to improve hatchery management so that it enhances, rather than harms, wild salmon populations.

²⁴⁰ *Trout Unlimited v. Lohn*, No. CV06-0483-JCC, 2007 U.S. Dist. LEXIS 42858 (W.D. Wash. June 13, 2007); see also *Trout Unlimited v. Lohn*, No. CV05-1128-JCC, 2007 U.S. Dist. LEXIS 42855 (W.D. Wash. June 13, 2007).

²⁴¹ *Trout Unlimited*, No. CV06-0483-JCC at *48.

²⁴² *Id.* at *50–51.

on the ESA's definition of "species" and *Southwest Center for Biological Diversity v. Babbitt*.²⁴³ The *Trout Unlimited* court observes that "*Southwest Center for Biological Diversity v. Babbitt* does not appear to support the point for which it is cited in the *Alsea* decision."²⁴⁴ Although not stated explicitly in the *Trout Unlimited* decision, one can also infer a suggestion that the patently ambiguous definition of "species" in the ESA provides dubious support, at best, for the *Alsea* holding.²⁴⁵ Commenting that the agency declined to appeal *Alsea* "for reasons that strike the court as rather transparent," the *Trout Unlimited* court suggests that insofar as its decision "conflict[s] with *Alsea*," it may "have the happy result of instigating needed appellate review."²⁴⁶

In evaluating the 2005 policy, the *Trout Unlimited* court concluded that it "is internally contradictory as to whether status determinations are made on the basis of the viability of natural populations or the ESU as a whole."²⁴⁷ The ambiguity, according to the court, "obscures the question of whether [the policy] is in accordance with the central purpose of the ESA: to promote naturally self-sustaining populations of endangered or threatened species."²⁴⁸

The court examined the application of the 2005 policy in the context of NMFS's decision to downgrade the listing of the Upper Columbia River steelhead ESU,²⁴⁹ which the plaintiffs had also challenged. In assessing the ESU, NMFS employed a two-phase analysis: first assessing the viability of the natural members of the ESU, then determining the impact of hatchery-bred fish on the ESU as a whole. Based on assessment of the natural population, a slight majority of Biological Review Team (BRT) scientists

²⁴³ *Id.* at *22.

²⁴⁴ *Id.* at *22 n.7.

²⁴⁵ *See id.* (reasoning that "While both cases parse the language of [the ESA's definition of 'species'], reading the statute not to preclude multiple subspecies in one DPS is not the same as reading the statute to preclude listing distinctions below that of a subspecies or DPS of a species"). *Trout Unlimited's* core holding, which may require distinctions below the DPS level if NMFS continues to group hatchery and wild fish in the same ESUs, also lends support to the inference.

²⁴⁶ *Id.* at *25.

²⁴⁷ *Id.* at *55.

²⁴⁸ *Id.*

²⁴⁹ Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead, 71 Fed. Reg. 834 (Jan. 5, 2006).

recommended listing the ESU as endangered.²⁵⁰ Thereafter, the agency's Artificial Propagation Evaluation Workshop (APEW) scientists "concluded that the presence of the hatchery populations alters the BRT's conclusion" and, on this basis, the agency adopted a "threatened" designation.²⁵¹ The *Trout Unlimited* court concluded that "the BRT's focus on the self-sustainability of natural populations shows proper adherence to the central purpose of the ESA" because it "put artificial propagation in its proper place as a factor that has the potential to either positively or negatively impact natural populations, and analyzed it *for* its effect on natural populations."²⁵² Citing the APEW's focus on the ESU as a whole, the court concluded that the 2005 policy effectively "mandates that status determinations be based on the *entire* ESU."²⁵³ Therefore, the court held that both the 2005 policy and the Upper Columbia River steelhead ESU listing are "contrary to the purpose of the ESA, and must be set aside."²⁵⁴ Unless NMFS formulates a new hatchery policy, the 1993 "Interim Hatchery Policy will be in effect."²⁵⁵

In addition, the court invoked the ESA's best available science mandate as a ground for invalidating the 2005 policy. The court reasoned "that nothing in the Administrative Record provides a scientific justification for basing status determinations on the entire ESU, and that to do so is, in fact, contrary to the best available scientific evidence."²⁵⁶

On the other hand, the court rejected plaintiffs' challenge to NMFS's determinations that hatchery-bred and naturally-occurring specimens may be members of the same ESU. The court noted scientific recommendations to separate the fish in ESU determinations, and that the combining the fish in a single ESU given the present legal landscape "strikes the court as odd," but concluded with little analysis that the determinations were not arbitrary and capricious.²⁵⁷

²⁵⁰ *Id.* at 854.

²⁵¹ *Id.* at 855.

²⁵² *Trout Unlimited*, 2007 U.S. Dist. LEXIS 42858, at *60–61 (emphasis in original).

²⁵³ *Id.* at *63.

²⁵⁴ *Id.* at *64.

²⁵⁵ *Id.* at *73.

²⁵⁶ *Id.*

²⁵⁷ *Id.* at *69–71.

As the court all but acknowledges, *Trout Unlimited* adopts a construction of the ESA in sharp contrast with *Alsea*. Thus, after NMFS spent years formulating a response to *Alsea*, the status of hatchery-bred Pacific salmon under the ESA remains unsettled. *Trout Unlimited* may prove to be a major victory for environmental interests, at least as significant as the victory that PLF achieved in *Alsea*. Beyond invalidating the 2005 policy, the court firmly declared that the ESA's core purpose is preservation of self-sustaining species in their native ecosystems. Although *Trout Unlimited* identifies the strongest bases in the statute for focusing on self-sustaining populations—the ecosystem protection goal and the best available science mandate's relationship to species recovery—the case provides no guarantee that such a focus will dominate future policy, particularly because it stands as one district court opinion in conflict with another ruling at the same level.

F. Other Problems with the 2005 Policy

Trout Unlimited reveals weaknesses in *Alsea*'s reasoning that infected NMFS's effort to construct a policy in harmony with it. *Trout Unlimited* views the policy as unfaithful to the goal of preserving self-sustaining populations. One can read the 2005 policy as designed to both focus preservation efforts on naturally-occurring populations and comply with *Alsea*, but this reading creates its own legal vulnerabilities. As suggested by the 2005 determination listing 16 ESUs,²⁵⁸ NMFS might use its discretion to allow taking of the listed hatchery fish.²⁵⁹ This thinly veiled effort to reinstate the "essential for recovery" criterion of the 1993 policy (the application of which was rejected in *Alsea*), would allow NMFS to use hatchery fish to satisfy the demand for catchable fish despite their inclusion in listed ESUs. However, by actually listing the hatchery-bred fish, then permitting taking, NMFS may run

²⁵⁸ NMFS expressly determined that production of hatchery fish in excess of conservation needs is desirable because it will create a surplus that can then be harvested to satisfy Native American treaty rights and "other societal values." Final Listing Determinations for 16 ESUs of West Coast, and Final 4(d) Protective Regulations for Threatened Salmonid ESUs, 70 Fed. Reg. 37,160, 37,167 (June 28, 2005).

²⁵⁹ The agency is required to "issue such regulations as [it] deems necessary and advisable for the conservation of [listed] species." 16 U.S.C. § 1533(d). Its discretion, in this instance, lies in determining what regulations are "necessary and advisable" to meet the conservation goals of the statute.

afoul of constraints not implicated by the 1993 policy's "essential for recovery" prong of listing determinations.

Several courts have suggested that the agencies' discretion to allow intentional taking of listed species is limited to situations where the taking promotes conservation of the species.²⁶⁰ In *Christy v. Hodel*, which involved regulated hunting of listed grizzly bears, the Ninth Circuit stated that the agencies are "authorized to permit 'regulated taking' . . . [but] must first find that 'population pressures within a given ecosystem cannot be otherwise relieved.'"²⁶¹ The 2005 determination listing sixteen ESUs, which suggested that take of listed hatchery fish is permissible, may conflict with this limitation because any population pressures could presumably be relieved through reduction in hatchery production.

The *Trout Unlimited* court recognized NMFS's effort to "circumvent [the] odd result" of affording hatchery-bred fish listing protection by "permit[ing] the harvest of listed hatchery fish that are surplus to the conservation and recovery needs of the ESU."²⁶² The court "conclude[d] that this appears to be an appropriate way to resolve this inconsistency."²⁶³ The court did not discuss *Christy v. Hodel*, which is arguably controlling precedent. Although distinctions between the cases may be drawn on the basis of differences between hatchery-bred and wild salmon that are not present within grizzly bear populations, or perhaps differences in the contexts of the species recovery efforts, the issue warrants consideration if NMFS seeks to retain this approach. NMFS's assumption of discretion to encourage propagation of listed salmon for the express purpose of satisfying fishing demand appears unparalleled elsewhere in ESA implementation. Such discretion is difficult to harmonize with statutory language that provides for discretion to promulgate regulations "for the conservation of [listed] species."²⁶⁴

More fundamentally, NMFS's 2005 policy failed to clearly address the core issue raised by the hatchery-bred salmon question. NMFS did not offer a satisfactory justification for its purported

²⁶⁰ *E.g.*, *Sierra Club v. Clark*, 755 F.2d 608, 612–13 (8th Cir. 1985).

²⁶¹ *Christy v. Hodel*, 857 F.2d 1324, 1336 (9th Cir. 1988).

²⁶² 2007 U.S. Dist. LEXIS, at *70, note 13.

²⁶³ *Id.*

²⁶⁴ 16 U.S.C. § 1533(d).

focus on protection of naturally-occurring populations and the policy does not provide a conception of “natural” salmon that suggests consistency with or relevance for other areas of biodiversity law. Thus, even if the policy stands, it will do little to advance a uniform vision of the proper role and extent of human intervention in species preservation and recovery. Constrained by the statute and unwilling to reconsider the ESU policy, NMFS’s limited response is not surprising, but as the following section demonstrates, a more broadly applicable conception of the “natural” is both necessary and possible.

IV. SIGNIFICANCE AND LESSONS OF THE CASE STUDY

The hatchery salmon issue and NMFS’s response to *Alsea* elude a straightforward administrative law analysis. Neither the court in *Alsea* nor the 2005 policy presented a strong argument that Congress has definitively spoken on the issue.²⁶⁵ The statute does not directly address what constitutes a “natural” species warranting listing consideration. The patent ambiguity in the ESA’s definitional language, such as the phrase “distinct population segments,” signals limitations on the ability of the statute in its current form to address the core issue of what constitutes a protectable “species.” Nonetheless, the ESA’s language and legislative history suggest limitations on the extent of deference the agency should receive, as the *Trout Unlimited* court recognized. The extended administrative history of the hatchery salmon issue, the conflicting constructions adopted in *Alsea* and *Trout Unlimited*, and the ongoing uncertainty concerning the status of hatchery fish all result from the statute’s ambiguity and impede progress toward realizing the ESA’s goals.

To understand how and why Congress should remedy this shortcoming, it is necessary to explore the relevance of the issues raised by the hatchery question in other contexts. A decisive appellate decision could resolve the hatchery-bred salmon issue, but would not necessarily control, or even influence, the resolution of similar questions in other areas of ESA implementation. Further, examining contexts in which similar questions arise will reinforce the conclusion that science alone cannot define

²⁶⁵ See *Chevron, U.S.A., Inc. v. Nat. Res. Def. Council, Inc.*, 467 U.S. 837, 842–43 (1984) (stating that if Congress’s intent is clear, the agency must effectuate it).

protectable entities and demonstrate the limitations of the best available science requirement for encouraging a uniform administrative response. Instead, a policy rationale for legally defining the relationship between “natural” species and their counterparts that result from human intervention must arise from social values. Reflecting such values, Congress should construct a method of distinguishing between the human intervention that is acceptable in pursuit of biodiversity conservation and restoration, and intervention that pushes the subject species outside the bounds of the “natural” world the law aims to preserve.²⁶⁶ I offer a proposal that, if implemented by Congress, would provide direct guidance to the agencies and establish a method for understanding the role of science in the types of issues represented by the hatchery problem. In the absence of congressional action, I also suggest how the agencies may interpret the ESA in its current form to give effect to the value of self-sustaining species implicitly recognized in the statute. Similarly, an appellate court reviewing *Trout Unlimited*, or a future case, could construe a focus on self-sustaining species as most accurately reflecting congressional intent.

A. *Broader Significance of the Issues
Raised by Hatchery Salmon*

The debate examined here is but one of the increasingly common contexts in which the agencies face difficult decisions concerning what qualifies as a protectable entity under the ESA. Some of these contexts raise the same or similar issues as hatchery salmon. Indeed, understanding of the hatchery salmon issue both informs and is informed by other ESA contexts in which similar definitional problems arise, and suggests lessons for biodiversity policy more generally.

Hybridization presents a very similar ESA problem to that of

²⁶⁶ Recognizing the shortcomings of the ESA for determining what groupings are eligible for listing, Professor Rohlf noted that the agencies “face a steep challenge in building an eligibility policy that moves away from contentious pseudoscientific line-drawing exercises, and instead makes progress toward a coherent strategy that directly addresses the policy concerns, as well as the sometimes profound questions about the relationship of humans and other species, that together make up the rationale behind a national policy that demands strong protections for imperiled biodiversity.” Rohlf, *supra* note 191, at 511.

hatchery salmon.²⁶⁷ FWS has struggled to develop a coherent policy addressing species that are threatened or endangered in their “pure” or “natural” form but have, with or without human intervention, more successful hybridized relatives. Likewise, FWS has vacillated on the issue of whether hybridization may be appropriate to prevent extinction. In one early example, the Dusky Seaside Sparrow was allowed to go extinct despite the likelihood that an aggressive hybrid policy could have restored the population with minimal genetic degradation.²⁶⁸

The western cutthroat trout is a current prominent example of the hybridization problem. In essence, non-hybridized western cutthroat trout face severe risks of extinction, but hybridized members of the species are faring much better. Some of the hybridization results from human intervention, but some results from non-human-induced interbreeding. In 2000, FWS determined that listing the trout was not warranted.²⁶⁹ Although it recognized that hybridization had occurred, FWS generally included hybrids as members of the species in its determination that the species was abundant. Following a successful challenge to the determination, the agency again declined to list the species.²⁷⁰ The agency acknowledged specific threats posed by hybridization, but determined that “natural populations” would be defined on the basis of their morphology.²⁷¹ Thus, unless hybrids looked different, they were generally considered along with pure trout, almost regardless of genetic differences. This approach is patently inconsistent with NMFS’s emphasis on genetics in defining

²⁶⁷ The issues surrounding hybridization are highlighted in Fred Bosselman, *A Dozen Biodiversity Puzzles*, 12 N.Y.U. ENVTL. L.J. 364, 455 (2004) (“Introduction of a potential hybridizing species may destroy the unique genetic characteristics of an existing population On the other hand, in highly inbred populations, hybridization may enhance the fitness of the species.”). FWS’s efforts to address the hybridization problem throughout the 1980s and the ethical implications of those efforts are discussed in Wetzler, *supra* note 12, at 174–84. Another recent example is discussed in Rohlf, *supra* note 191, at 516–18.

²⁶⁸ E.g., Kevin D. Hill, *The Endangered Species Act: What Do We Mean By Species?*, 20 B.C. ENVTL. AFF. L. REV. 239, 257–61 (1993).

²⁶⁹ See 12-Month Finding for an Amended Petition to List the Westslope Cutthroat Trout as Threatened Throughout Its Range, 65 Fed. Reg. 20,120 (Apr. 14, 2000); see also Rohlf, *supra* note 191, at 516–18.

²⁷⁰ Reconsidered Finding for an Amended Petition to List the Westslope Cutthroat Trout as Threatened Throughout Its Range, 68 Fed. Reg. 46,989 (Aug. 7, 2003).

²⁷¹ *Id.* at 46,992, 46,994.

salmon ESUs.

This inconsistency in agency interpretation reinforces the conclusion that the ESA is ambiguous on this point. Although both agencies sought to protect “natural populations,” they employed different methodologies to define such populations. This illustrates that, absent more clear statutory guidance, “natural” can be shaped to reach either outcome.

Much like hatcheries in the context of salmon restoration, hybridization can provide a means to improve the viability of a species. Where a species has become so rare that it suffers deleterious effects from inbreeding, controlled hybridization may afford an opportunity to increase necessary genetic variability without undermining the unique genetic composition of a species. The prime example is the Florida panther, whose only apparent hope for avoiding extinction is hybridization.²⁷² Through limited introduction of closely related Texas cougar into the panther’s habitat and careful monitoring, an interagency committee expects to improve the panther’s genetic make-up without deleterious effects.²⁷³

Of potentially greater significance, the issues posed by hatchery-bred salmon resemble challenges currently raised by genetic engineering. Genetic modification of salmon for aquaculture, for example, is beginning to raise questions of the relationship between such genetically engineered species and their “natural” relatives.²⁷⁴ If genetically modified salmon escape aquaculture operations and begin inter-breeding with non-genetically modified salmon, their offspring would raise issues closely resembling the questions posed by hatchery-salmon and hybridized species.²⁷⁵

²⁷² See Stacy A. Barker, Comment, *The Use of the South Florida Multi-Species Recovery Plan to Restore Threatened and Endangered Species*, 9 DICK. J. ENVTL. L. & POL’Y 507, 525–27 (2001).

²⁷³ See *id.*

²⁷⁴ See Blake Hood, *Transgenic Salmon and the Definition of “Species” Under the Endangered Species Act*, 18 J. LAND USE & ENVTL. L. 75 (2002); see also Graham M. Wilson, Note, *A Day on the Fish Farm: FDA and the Regulation of Aquaculture*, 23 VA. ENVTL. L.J. 351, 378–83 (2004).

²⁷⁵ These biodiversity concerns are in some ways related to similar concerns with genetically modified (GM) food, an area of substantial scientific uncertainty, high public interest, and low consensus. Both raise the issue of what qualifies as “natural” and whether law should embrace a policy that seeks to preserve such a “natural” quality. Cf. David Winickoff et al., *Adjudicating the GM Food Wars: Science, Risk, and Democracy in World Trade Law*, 30 YALE J.

A clear understanding of the “nature” that we seek to protect carries great significance in other policy areas that impact biodiversity, such as wilderness.²⁷⁶ As noted above, “wilderness” and “nature” are similarly malleable concepts. However, the use of wilderness concepts to advance biodiversity protection (through, for example, the use of preserves), has not been fully embraced in the law.²⁷⁷ Establishing a sound theory and concrete guidance for focusing ESA protection on species defined by a low degree of direct human impact may shape conceptions of the nation’s wilderness areas and provide support for advancing a unified vision of biodiversity policy.

The hatchery-bred salmon question is infused with issues of broad and fundamental significance. For example, when is a species too altered to be considered “natural” and to what extent is human intervention in species reproduction an acceptable recovery strategy? Resolution of these questions will suggest answers to many other biodiversity puzzles. In refining the definition of “natural” in this context, we may then better understand the “nature” under review when drawing lines among DPSs, identifying a species’ “range,”²⁷⁸ defining the legal status of genetically modified species, or considering the balance of human uses and biodiversity protection in federal land management. If a consistent methodology is mandated for determining genetic or other distinctions in species heavily impacted by human intervention, the methodology will likely inform and promote a more uniform understanding of the broader goals of biodiversity law, which can begin a process that coalesces into a uniform response to the biodiversity crises.

B. *The Ethics of Protecting Wild Fish: The Need for a Policy*

INT’L L. 81 (2005).

²⁷⁶ See Susan Harrison, *Biodiversity and Wilderness: The Need for Systematic Protection of Biological Diversity*, 25 J. LAND RESOURCES & ENVTL. L. 53 (2005) (calling for integration of biodiversity and wilderness policy). The goal of protecting “wilderness” is established in the Wilderness Act, 16 U.S.C. §§ 1131–1136 (2000); see also Robert B. Keiter, *Preserving Nature in the National Parks: Law, Policy, and Science in a Dynamic Environment*, 74 DENV. U. L. REV. 649 (1997).

²⁷⁷ See Harrison, *supra* note 276; cf. Bradley C. Karkkainen, *Biodiversity and Land*, 83 CORNELL L. REV. 1, 41–57 (1997).

²⁷⁸ See, e.g., Doremus, *Science Mandate*, *supra* note 7, at 420–21 (discussing the problem of defining the historic range of grey wolves).

Preserving Self-Sustaining Populations

The malleability of “nature” in rhetoric, as illustrated by the debate over counting hatchery salmon, reveals the need for a clearer understanding of why the ESA should seek to protect naturally-occurring salmon when hatchery-bred fish provide an available alternative. Examining whether to protect only naturally-occurring salmon cuts to the heart of biodiversity policy and poses a fundamental philosophical question of the human relationship to the natural world.²⁷⁹ To justify protection of only “wild” fish, we must reach an understanding of the human relationship to “nature” that requires a respect for that which is not dependant on human intervention and provide a rationale for protecting it as such.

The ethical underpinnings of environmental law are receiving renewed attention in legal literature, but bringing them to bear on issues such as this has been difficult and slow.²⁸⁰ As illustrated above, scientific developments and other factors suggest that the challenge and complexity of applying the relatively simplistic concepts enshrined in the ESA will only increase. Although the ESA might be understood to embrace a certain construct of nature in a broad way,²⁸¹ on the issue of hatchery-bred salmon, the statute is open to differing interpretations. Thus, as the preceding Parts show, the salmon hatchery debate signals that the ESA is not underlain by a clear, universally understood ethic,²⁸²

²⁷⁹ E.g., Rohlf, *supra* note 191, at 516 (“[A]re fish reared in a hatchery protected when similar—but wild—fish are listed? These difficult issues encompass not just policy decisions, but also questions that veer into the philosophical: What is natural? What is the proper role of humanity in protecting the wild?”).

²⁸⁰ For example, in 2003 the U.C. Davis law school held a symposium on environmental ethics and policy. See 27 ENVIRONS ENVTL. L. & POL’Y J. (2003) (Issue 1). Particularly relevant is Christopher D. Stone, *Do Morals Matter? The Influence of Ethics on Courts and Congress in Shaping U.S. Environmental Policies*, 27 ENVIRONS ENVTL. L. & POL’Y J. 13 (2003) (concluding that environmental ethics have not had a substantial policy impact); see also Tarlock, *supra* note 182 at 241–42.

²⁸¹ See Keith H. Hirokawa, *Dealing with Uncommon Ground: The Place of Legal Constructivism in the Social Construction of Nature*, 21 VA. ENVTL. L.J. 387, 411 (2003) (stating that the ESA’s habitat protection provisions may be understood to “conceive of the human impact in a broader, more biocentric approach than might be expected under a property ownership-based scheme of nature”).

²⁸² See, e.g., Alyson C. Flournoy, *Building an Environmental Ethic from the Ground Up*, 27 ENVIRONS ENVTL. L. & POL’Y J. 53 (2003). On the ESA and the need for ethics in developing a policy for hybrids, see Wetzler, *supra* note 12, at

but can be read according to various ethical theories²⁸³ or conceptions of nature.²⁸⁴ However, the debate preceding 2005 hatchery policy, coupled with the policy's explicit focus on wild salmon, suggests an evolving societal recognition of value in self-sustaining species. This is a profound concept that can be defined and justified for more general application. Given the stark contrast in levels of human intervention between hatchery-bred salmon and naturally-reproducing fish, the hatchery-salmon question provides a clear context for much needed consideration of the fundamental values underlying this aspect of the statute that can then be applied in similar cases and related contexts.²⁸⁵

Several theoretical bases exist for explaining the need to conserve self-sustaining species. The concept is most strongly supported by ethical theories of intrinsic value in species and ecosystems, although other theories can also be employed. Explicit legal identification of self-sustaining species as the focus of listing determinations can encompass these perspectives and should serve as a core principle underlying the ESA and biodiversity policy more generally.

1. *Intrinsic Value in Species and Ecosystems*

A strong argument for the intrinsic value of species exists, which points directly to the importance of preserving self-sustaining salmon, by locating the value of species in reproduction.²⁸⁶ Holmes Rolston III argues that “[t]he species defends a particular form of life, pursuing a pathway through the world, resisting death (extinction), by regeneration maintaining a normative identity over time.”²⁸⁷ Noting that species function as

183–84.

²⁸³ See Huffman, *supra* note 12; see also Flournoy, *supra* note 12, at 99–101.

²⁸⁴ Hirokawa, *supra* note 281, at 407–08.

²⁸⁵ Professor Alyson Flournoy, for example, argues that “the continued maturation of a body of [environmental] law appropriate to our society’s needs and values depends on greater awareness of the values and ethics we currently embrace through our laws.” Flournoy, *supra* note 12, at 118. Professor Holly Doremus explored an approach to law that could “force us toward the discussion of environmental values we so sorely need.” Holly Doremus, *Constitutive Law and Environmental Policy*, 22 STAN. ENVTL. L.J. 295, 298 (2003).

²⁸⁶ See Holmes Rolston III, *Value in Nature and the Nature of Value*, in ENVIRONMENTAL ETHICS: AN ANTHOLOGY 143, 146–48 (Andrew Light & Holmes Rolston III eds., 2003).

²⁸⁷ *Id.* at 147–48.

valuers through identifying valuable traits to pass on to the next generation, he concludes that “the essence of this . . . value ability is the ability to reproduce.”²⁸⁸ This perspective “locates value-ability innate or intrinsic within the organism, but it just as much locates the value-ability as the capacity to re-produce a next generation.”²⁸⁹ That poses a further question of whether and when human intervention in the reproductive process of a species may be justified.

To address this, we can follow Rolston’s conception of the value of ecosystems. He posits that “[v]alues are intrinsic, instrumental, and systemic, and all three are interwoven, no one with priority over the others in significance, although systemic value is foundational.”²⁹⁰ Thus, neither intrinsic values located within a species nor the instrumental value of species can be understood “without the encompassing systemic creativity.”²⁹¹ On this view, “there is value wherever there is positive creativity” and such creativity “can also be present objectively in living organisms with their lives defended, and in species that defend an identity over time, and in systems that are self-organizing.”²⁹² To the extent that we seek to preserve natural reproduction within species, we defend this creativity that has organized the ecosystems in which we live.

Intervention designed to support the species’ recovery comports with this theory of defending the creative capacity of species.²⁹³ Intervention that would allow subjugation of the species to continued human intervention, such as hatcheries designed only to produce salmon for fishing purposes, do not. The problem with zoos as a method of preserving species, Rolston asserts, is that “they cannot begin to simulate the ongoing dynamism of gene flow over time under the selection pressures in a wild biome.”²⁹⁴ If Rolston is correct that “[t]he main thing

²⁸⁸ *Id.* at 148.

²⁸⁹ *Id.*

²⁹⁰ *Id.* at 150.

²⁹¹ *Id.*

²⁹² *Id.* at 152.

²⁹³ For instance, Rolston uses the example of Florida panthers in developing his theory of duties to species. See HOLMES ROLSTON III, ENVIRONMENTAL ETHICS: DUTIES TO AND VALUES IN THE NATURAL WORLD 139–40 (1988).

²⁹⁴ *Id.* at 153.

wrong is that extinction shuts down the generative processes,”²⁹⁵ hatchery-breeding programs as a permanent method of preservation fail to conserve the essential element of the species—the flow of the genetic code and form through individuals changing in response to the habitat. To control the reproductive process is, in important respects, no less intrusive than to completely remove a species to a zoo. Recognizing a duty to species establishes a duty that runs not to the particular form, which for salmon might be preserved through aggressive hatchery production regardless of natural reproduction, but to the “*formative* (speciating) process,”²⁹⁶ which for salmon requires conserving naturally-reproducing populations. Arguably, the ESA already recognizes this by seeking to protect not only species, but the ecosystems upon which they depend.

2. *Additional Rationales: Intergenerational Equity and Avoiding Unnecessary Harm*

Sources other than intrinsic value of species also support an underlying moral obligation to direct human intervention toward maintaining the ability of species to self-sustain.²⁹⁷ The most obvious is a duty to future generations. On this account, even without a duty to species, we have an obligation to preserve them for generations that follow.²⁹⁸ As Congress recognized in passing the ESA, in species lie resources that we do not fully understand.²⁹⁹ If we recognize, as we must, that our knowledge is

²⁹⁵ *Id.* at 144.

²⁹⁶ *Id.* at 137.

²⁹⁷ One can construct reasons to support a duty toward species based solely on instrumental or material value, as environmentalists have sometimes done. *See, e.g.,* Holly Doremus, *The Rhetoric and Reality of Nature Protection: Toward a New Discourse*, 57 WASH. & LEE L. REV. 11, 35–36 (2000) (“[M]any [environmental advocates] emphasize material arguments, adding ethical ones almost as an afterthought. Some openly acknowledge relying on material arguments because they fear only those will carry political weight.”). Although such arguments once dominated nature rhetoric, ethics evolve. *See, e.g.,* ROLSTON, *supra* note 293, at 342. Ethical arguments based on intergenerational equity and, more so, the intrinsic value of species are relatively recent, but represent an increasingly common approach to the issue.

²⁹⁸ *See, e.g.,* ROLSTON, *supra* note 293, at 127.

²⁹⁹ The House report supporting passage of the ESA states: “From the most narrow possible point of view, it is in the best interest of mankind to minimize the losses of genetic variations. The reason is simple: they are potential resources. They are keys to puzzles which we cannot solve, and may provide answers to questions which we have not yet learned to ask.” H.R. REP. NO. 93-

incomplete and that future scientific and other advances will draw from the same pool of resources from which we have thus far constructed our society, we should provide a full range of options to future generations. Thus, we must preserve fully functioning ecosystems, which include self-sustaining species.³⁰⁰

Even beyond intrinsic value and moral duty, we can find a fundamental reason to sustain the ability of species to independently survive. This preservation is a virtue because, in most circumstances, to do otherwise exudes a reckless hubris and causes unnecessary ecological damage.³⁰¹ If a species is placed at the mercy of continuing propagation operations where it is not strictly necessary for sustaining social and economic systems, it unnecessarily subjugates the natural world and thereby threatens to undermine the biological systems upon which humanity and other species directly depend without providing a worthy benefit in return. Thus, activities that may cause species to become dependant upon human intervention should only be undertaken with the utmost caution and only where necessary to achieve a goal that can be defended as of equal value to survive of a species.³⁰²

These rationales, tailored here to provide a response to the issues posed by the presence of hatchery-bred salmon, suggest policy responses to related problems. None demand that naturally-reproducing salmon have rights, *per se*.³⁰³ Yet, if we accept that the existence of self-perpetuating species has moral value, this proposition leads to the conclusion that the value should be explicitly recognized in the law so that, although the value may be overcome in certain instances, the ability of species to remain

412, at 5 (1973).

³⁰⁰ *C.f.* Ernest Partridge, *Future Generations*, in A COMPANION TO ENVIRONMENTAL ETHICS, *supra* note 12, at 385–87.

³⁰¹ Religiously-based arguments have been advanced on a similar basis. *See, e.g.*, Nat'l Religious P'ship for the Env't, *Why is the Environment a Religious Concern?*, <http://www.nrpe.org/why/index.html> (last visited June 2, 2007).

³⁰² As a hypothetical example, it could be worth requiring continuing intervention to maintain a species in order to use more of its habitat as productive agricultural land in an area with chronic food shortages.

³⁰³ Christopher Stone is among the most influential proponents of moral pluralism and rights of natural objects. *See, e.g.*, Christopher D. Stone, *Moral Pluralism and the Course of Environmental Ethics*, in ENVIRONMENTAL ETHICS, *supra* note 286, at 193. For an opposing position, see J. Baird Callicott, *The Case Against Moral Pluralism*, in ENVIRONMENTAL ETHICS, *supra* note 286, at 203.

independently viable receives presumptive protection. This recognizes, among other things, the potential for scientific developments to shape our perspective on moral obligations.³⁰⁴ In the context of this case study, such recognition requires that in implementing the ESA, we do not allow the species *process* of salmon populations to be extinguished simply because we are able to remanufacture the salmon *form* at will. The rationales advanced illustrate bases for advancing the law in one concrete case, but also lay the groundwork for establishing lines between populations within species and, more broadly, targeting limitations on human impact toward achieving the goals that already underlie biodiversity policy. Through carefully defining these goals, we can only improve the results of our legal mandates.

C. *Defending an Ethical Choice and Defining the Role of Science*

Recognizing the value of self-perpetuating ecosystems and species, both for their own sake and for their utility to humans, provides the strongest rationale for preserving the ability of salmon and other species to remain viable without continuing human intervention. Arguments against this position can be raised, but they rest upon unacceptable assumptions.

1. *The Value of Explicitly Recognizing a Clear Policy Favoring Self-Sustaining Species*

First, one might object to an explicit legal recognition of the value of self-sustaining species. However, refining what we mean by “nature” in the ESA (and perhaps elsewhere in biodiversity law) should help to more properly frame the interests at stake. This will limit unnecessary confrontation in commentary on administrative decisions by helping to remove the possibility of unthinking application of a moral “rule of thumb” that natural is preferable to artificial³⁰⁵ and, conversely, the potential perception

³⁰⁴ In this sense, at least, the ethic espoused here is akin to that advanced in A. Dan Tarlock, *Environmental Law: Ethics or Science?*, 7 DUKE ENVTL. L. & POL'Y F. 193, 222–23 (1996); see also Holmes Rolston III, *Science-Based Versus Traditional Ethics*, in ETHICS OF ENVIRONMENT AND DEVELOPMENT 63 (J. Ronald Engel & Joan G. Engel eds., 1990).

³⁰⁵ Cf. Cass R. Sunstein, *Moral Heuristics and Moral Framing*, 88 MINN. L. REV. 1556, 1577–78 (2004) (giving the example that many individuals' preference for bottled spring water represents the application of such rules of thumb).

that “nature” is a term manipulated to suit a party’s current position. Instead, such recognition constitutes a conscious embrace of a clearer, and thus less malleable, articulation of the components of nature that the ESA should protect than the statute’s current unclear definition of “species.”

2. *Understanding the Interplay of Biodiversity Policy Goals, Economics, and Science*

A second potential objection is more troubling, but equally unavailing. One could assert that the philosophical arguments stated above should be tempered by economic analysis. Numerous proposals for integration of cost-benefit analysis in ESA listing decisions exist and some of them contain solid rationales. These arguments may focus on concerns such as the allocation of societal resources³⁰⁶ or improving public knowledge of potential benefits of listings.³⁰⁷ Such arguments may have merit if applied, as intended, to determining whether to list a species and, if listed, how to prioritize societal resources in resolving perceived conflicts between ecological and economic priorities. However, they do not present a persuasive rationale for allowing economic considerations to determine what a “species” is. The reason for this has two components: one based on the value society may ascribe to biodiversity, the other based on the appropriate role of science in determining what constitutes a listable entity.

First, exclusion of economic analysis forces a determination of what society seeks to protect independent of the costs such protection may impose. This does not preclude economics from the entire ESA process because determining which species to study most intensely or what qualifies as critical habitat, for example, may involve a balancing of conservation and economic priorities. However, so long as law seeks to protect species for a reason other than their immediate value to humans, the threshold identification of potentially threatened groupings must turn on a definition of that group that is independent of its economic impact. Economic analysis, in this context, presents merely an escape valve, an unwillingness to face the most difficult questions raised by the human impact on ecosystems. If we define species based on

³⁰⁶ Barton H. Thompson, Jr., *People or Prairie Chickens: The Uncertain Search for Optimal Biodiversity*, 51 STAN. L. REV. 1127 (1999).

³⁰⁷ Garcia, *supra* note 187, at 606–09.

something more than their economic value to humans, we must assess what precisely we seek to protect. To exclude economic analysis here is to acknowledge that the very preservation of species depends on a view recognizing that human interference with nature should have limits. We must first identify the nature under consideration, and then apply an analysis of its value to us. To reverse the process is to tip the scales in a way that undermines a core assumption underlying biodiversity policy—that humanity should limit its impact, whether for humanity’s sake or for the sake of nonhuman nature.

Second, in the absence of an economic basis for determining what counts as a species, science may play its proper role in assessing the characteristics of proposed populations against the articulation of policy goals in the ESA. Ultimately, the question of what counts reverts to a question of what we seek to protect through biodiversity policy. Provided that a clear, albeit general, goal can be discerned (as I argue it should), science provides the means for measuring the relationship between a particular proposed “species” against the goals. Genetic, behavioral, and other scientific analyses will reveal differences between hatchery fish and naturally-spawning fish, hybrids and “pure” species. Upon recognizing these distinguishing characteristics, the policy goal of protecting self-sustaining species becomes applicable to a concrete case. It is then appropriate to consider how much (economically) it is worth to society to achieve that goal.

This recognition of the appropriate role of science acknowledges the common criticism of the ESA’s listing provision as encouraging “over reliance” on science.³⁰⁸ Professor Doremus and others have noted that in the hatchery salmon question and similar contexts, the best available science requirement can play only a limited substantive role.³⁰⁹ The argument has merit. However, it does not detract from the function of science in providing information to be employed in drawing distinctions between species.

The relationship between science, social values, and law has been aptly stated by others. Dale Jamieson, for example, noted:

Science has alerted us to the impact of humankind on the

³⁰⁸ E.g., Kristin Carden, *Bridging the Divide: The Role of Science in Species Conservation Law*, 30 HARV. ENVTL. L. REV. 165, 195 (2006).

³⁰⁹ Doremus, *Science Mandate*, *supra* note 7, at 421–26.

planet, each other, and all life. This dramatically confronts us with questions about who we are, our relations to nature, and what we are willing to sacrifice for various possible futures. We should confront this as a fundamental challenge to our values and not treat it as if it were simply a technical problem to be managed.”³¹⁰

Shelia Jasanoff has concluded that:

environmental law has established itself as an essential resource in humankind’s struggle to achieve sustainable ways of living on earth. Like any other system of laws, environmental legislation importantly articulates and enforces norms that society holds in high value, but this is not its exclusive function [I]t is by providing a framework within which the scientific, ethical, and political dimensions of human experience can be simultaneously and continuously deliberated that environmental law offers the greatest promise for humanity.³¹¹

Science aids in identifying the issues that require redress, finding tools to resolve them, and measuring progress toward goals designed to confront those problems. Law, through the hatchery issue and similar debates, provides for a public discussion of the issues underlying human intervention into nature. By attaching consequences to their resolution, the ESA sharpens the issues that science poses and demands social policy positions in response. Thus, the next step is to embrace a policy more clearly identifying what should be protected so that the discussion can move forward toward retaining an appropriate level and type of “nature” while pursuing continued development of society.

V. INCORPORATING PROTECTION OF SELF-SUSTAINING SPECIES

We have now seen that both NMFS’s conclusion and ethical theory support protection for wild salmon and other self-sustaining species. In order for these arguments to have relevance to on-the-ground management activities, they must be translated into concrete proposals that establish criteria for their application. Given the fundamental nature of the issue for biodiversity conservation policy, these criteria should be embedded in the

³¹⁰ Dale Jamieson, *Ethics, Public Policy, and Global Warming*, in ENVIRONMENTAL ETHICS, *supra* note 286, at 378.

³¹¹ Shelia Jasanoff, *Law*, in A COMPANION TO ENVIRONMENTAL ETHICS, *supra* note 12, at 344–45.

statute through congressional amendment. Failing that, the agencies can move toward recognition of these priorities through specific policy changes concerning the definition of DPSs. I offer two proposals below and discuss the role of appellate review in the absence of congressional or agency action.

A. *A Proposal for Congressional Action*

Congress should clarify the “nature” protected by the ESA in three ways: clarifying the statute’s goals, establishing a floor below which human intervention must not be allowed to justify a decision not to list, and providing the agencies specific guidance for drawing distinctions within species.³¹² These revisions are needed if the existing purposes of the ESA are to be implemented in a consistent and coherent manner. Resolving the problem of what constitutes a “species,” as posed by hatchery salmon and similar questions, encompasses a fundamental policy choice beyond the expertise of agency scientists and requires uniformity in implementation of the statute. This uniformity will likely only arise if Congress establishes a clear method for drawing lines, rather than allowing the agencies to draw them on an ad hoc basis.

First, the core purpose of the statute must be clarified. In line with the goals underlying biodiversity protection in general, Congress should establish that the ESA seeks to protect a natural world in which species do not depend on constant human intervention for survival and in which humanity recognizes the minimum requirements of other species as the outer limits of alteration of ecosystems. Such a view appropriately provides a check on potentially destructive development by calling for accommodation of pre-existing ecosystem components when adding the components of human development. Although this does not necessarily mandate listing of all “natural” populations that face immediate threat of extirpation, this goal will focus attention on self-sustaining populations and the ecosystems upon which they depend as the elements of biodiversity that the ESA seeks to protect. It is also designed to prevent unnecessary and inefficient extended debates such as those surrounding the

³¹² Whether Congress should also narrow the reach of the best available science requirement is beyond the scope of this Article, but retaining the requirement is valuable for at least the limited purpose of defining listable entities. See *infra* note 313.

hatchery salmon issue. Fundamentally, the goal seeks to ensure that our children and grandchildren may enjoy the nature we enjoy, whatever their conception of it may be. It recognizes that however much “nature” is a concept shaped by human thought, it stands for an objective reality that we depend on and do not fully understand. It ensures protection of not only discrete segments of populations, but also the ecosystems upon which they depend, as Congress intended in enacting the ESA.

Second, Congress must establish a floor. The statute should unequivocally mandate that for a determination that a species does not require listing, the species is defined as a group that does not require continuing human intervention or the presence of closely-related species fundamentally altered by such intervention to maintain its viability. In other words, if preservation of natural species is the goal of the statute, that preservation must be defined in such a way that species dependant upon human intervention or created through past intervention do not prevent listing of their “natural” relatives. The floor should be set at the level of species’ dependence because this allows room for agency discretion in close cases, but ensures that deleterious hybrids and human-produced salmon do not prevent necessary protections for self-sustaining populations. Further, this floor will not impede the use of less invasive measures, such as improvements in habitat that promote more successful reproduction, as tools in restoring species.

Third, the statute should provide guidance for agencies determining whether members of a particular species fall above or below the floor. In other words, Congress must give the agencies guidance in exercising their expertise to determine whether members of a species affected by human actions still qualify as members of the species for which protection may be warranted. Thus, the statute should establish that intervention, whether pre-existing or employed for conservation purposes, must not significantly alter the genetics, behavior, or morphology of the species. In the salmon context, NMFS has moved toward such an approach by improving the ability of hatcheries to produce fish that more closely resemble the populations into which they enter. Yet such fish should not qualify for listing considerations unless they integrate and reproduce with self-sustaining populations. Exactly how much alteration is too much will likely depend on the situation and, thus, some discretion must be left to agency

expertise. However, by adding this guidance, some of the political pressure imposed upon the agencies by contentious value choices may be alleviated. More importantly, determining the significance of differences can be more closely tied to scientific analysis under this proposed guidance than under the current ambiguous definition of “species,” and thus, the guidance will serve to refine the meaning of the statute’s best available science mandate in listing.³¹³

These three amendments would address several core problems of the ESA. They do not replace it wholesale, but focus the agencies’ efforts on endeavors to which their expertise is better suited. Scientific analysis can determine, to a reasonable degree of certainty, whether a species is dependent on human intervention for its survival and the extent to which human intervention has forced, or threatens to force, a species away from the genetic, behavioral, and morphological projection it would have otherwise followed. Unless Congress enacts a wholesale revision of biodiversity policy, these revisions offer the most appropriate way to respond to the questions of what is “natural” that have arisen in implementation of the statute.

B. *An Administrative Proposal*

Although the depth of the issues at stake suggests that a congressional resolution is most appropriate, Congress may be slow to act. In that case, NMFS can provide a more effective response to the problem highlighted by *Alsea* and *Trout Unlimited*. NMFS can revise its ESU policy.

The current NMFS ESU policy criteria fail to articulate any recognition that hatchery-bred salmon may be different from naturally-occurring salmon despite genetic similarities.³¹⁴ The current ESU policy could, at least in theory, support delisting due to abundant hatchery fish even if those fish never reproduced. In light of this, the criteria fail to fully effectuate the intent of the

³¹³ The exclusive reliance on science currently required by the statute is appropriate in the context of determining a species’ dependence on human intervention and, more generally, in establishing groupings for listing consideration. Whether the mandate is appropriate for listing questions beyond defining “species” is beyond the scope of this Article.

³¹⁴ Policy on Applying the Definition of Species Under the Endangered Species Act to Pacific Salmon, 56 Fed. Reg. at 58,618 (Nov. 20, 1991); see *supra* Part I.C.

ESA to protect ecosystems that salmon depend upon for reproduction. Therefore, at a minimum, a third criterion is appropriate.

In the absence of congressional action, NMFS should revise its ESU policy to include a criterion that acknowledges its understanding of potential differences between wild and hatchery fish. NMFS could use hatchery origin as a factor in defining ESUs.³¹⁵ Such a criterion would be justified because naturally-occurring specimens are the only salmon relevant to the statute's goal of preserving ecosystems. Further, they may be viewed as the most appropriate representatives of the genetic legacy of a population. This approach would nonetheless allow the use of hatchery salmon to restore naturally-occurring populations because hatchery-bred fish that successfully integrate into those populations will propagate outside of hatcheries, and their offspring would receive the same level of protection as other naturally-occurring members of the population.

Legally, this approach is more defensible than NMFS's 2005 hatchery policy. It would not conflict with *Trout Unlimited*. Further, a determination that naturally-occurring reproduction is relevant to the DPS concept would receive deference as an agency construction of the statute because it resolves an ambiguity. In addition, this offers the agency an avenue for determining that hatchery-bred salmon do not warrant protection, rather than allowing intentional taking of listed hatchery fish. This approach would clearly allow hatchery production as an effort to restore listed ESUs and would neither prohibit nor mandate production of excess hatchery salmon to temporarily satisfy fishing demands. If recovery efforts are successful, a permanent policy in favor of hatchery production would become unnecessary as restored fish would ultimately be de-listed. Failing successful recovery, NMFS may be able to permit some long-term hatchery production to

³¹⁵ NMFS responded to this idea in its 2005 Hatchery Policy, stating that the agency "chose not to include inherently non-biological considerations in delineating DPSs" and, therefore, would not consider "the intent of the ESA [] to conserve natural self-sustaining populations and functioning ecosystems" in defining ESUs. Policy on the Consideration of Hatchery-Origin Fish in Endangered Species Act Listing Determinations for Pacific Salmon and Steelhead, 70 Fed. Reg. 37,204, 37,207-08 (June 28, 2005) (to be codified at 50 C.F.R. §§ 223-224). However, NMFS's 1992 technical memorandum, among other sources, suggests that hatchery origin is, in fact, a biological consideration. See Hard, *supra* note 100.

satisfy fishing demand, provided it does not interfere with recovery efforts.

A similar approach could be adopted for other species. Protection for the western cutthroat trout could, for example, extend only to those specimens that fall within a defined degree of genetic variation from non-hybrid specimens. This approach would initially be problematic because it may be difficult to morphologically differentiate hybrids and non-hybrids. Nonetheless, FWS could implement a short-term listing of all members of the species and adopt management strategies to reduce the extent of deleterious hybridization resulting from anthropocentric causes, thereby promoting the restoration of non-hybrid stock. Properly implemented, such an approach would enable a re-evaluation of the populations within several years, which would provide an opportunity to reconsider distinguishing between hybrid and non-hybrids to determine if listing remains necessary for populations whose genetic lineage retains significant non-hybrid characteristics.

Although this administrative approach is inferior to a congressional solution, it offers a middle path between a refined statutory mandate and the current state of confusion and inconsistency. As such, it offers a small step forward in recognition of the value of self-sustaining species.

C. Appellate Review

If NMFS appeals *Trout Unlimited*,³¹⁶ the Ninth Circuit should use the opportunity to firmly establish that the ESA intends to preserve self-sustaining populations of Pacific salmon. An appeal of *Trout Unlimited* would squarely present that issue and provide the option of implicitly overruling *Alsea*'s holding that the statute's definition of "species" prevents the agencies from distinguishing between members of a DPS or subspecies in listing

³¹⁶ NMFS could decline to appeal *Trout Unlimited*. Although the court denied a motion by an intervening property-rights group represented by PLF, whether PLF could obtain appellate review is unclear. Such review may be precluded by considerations similar to those underlying the Ninth Circuit's reasoning in dismissing the *Alsea* appeal. If NMFS does not appeal, the agency should revisit its ESU policy as I suggest above. Alternatively, NMFS should revert to the 1993 policy, reinstated by *Trout Unlimited*. An effort to craft a new hatchery policy, in light of the conflicting analyses of *Alsea* and *Trout Unlimited*, would likely produce additional litigation and uncertainty.

determinations. An appellate decision could also weigh in on the propriety of permitting the production of listed hatchery-bred salmon beyond conservation needs solely to satisfy fishing demand.

Even a narrowly drawn appellate decision could definitively resolve the conflict between the holdings of the district court cases. Drawn broadly, an appellate opinion might offer some guidance in similar contexts throughout ESA implementation. However, a Ninth Circuit ruling is unlikely to define the contours of NMFS's approach going forward, unless it completely upheld the 2005 policy. Moreover, appellate review is unlikely to authoritatively address the fundamental underlying issue of what aspects of nature the ESA seeks to protect in a manner applicable to all contexts of its implementation. No court opinion is likely to—and perhaps no court opinion should—provide a firm, durable and generally applicable resolution to that quasi-philosophical policy question.

Although inferior to a congressional amendment that provides a framework for agency analysis of the components of biodiversity that warrant legal protection, an appellate decision could lay the groundwork for increased attention to the definition of “natural” species under the ESA. For the same reasons the hatchery-bred salmon question makes an ideal case study of the issue, the context is perhaps the best in which such a ruling could arise. A careful opinion could draw upon the scientific advances since the 1970s to conclude that, despite an arguably ambiguous legislative history, Congress's explicit intent to preserve ecosystems demonstrates a controlling intent to preserve self-sustaining species. This approach, like the district court opinion, would reflect a more nuanced appreciation of congressional intent and scientific knowledge than the *Alsea* court expressed. Even if necessarily limited to the context in which it arises, such a decision would end the prolonged and inefficient administrative battle over the status of hatchery-bred fish and provide a degree of guidance for future agency efforts in other areas of ESA implementation.

VI. CONCLUSION

The ESA provides one of the strongest mandates in environmental law, and its application can raise fundamental questions concerning the aims of environmental policy. The question of whether hatchery-bred salmon constitute a sufficient substitute for self-sustaining salmon populations illustrates this

well.

The ESA offers a valuable tool in the pursuit of biodiversity protection, but implementation has revealed an ambiguity that may undermine the protection of self-sustaining species and their ecosystems and thereby limit the effectiveness of legal measures. This threat requires a remedy. Following a prolonged comment period, NMFS purportedly determined to continue its focus on wild salmon, reflecting a societal recognition of value in self-sustaining populations. An ethical analysis reveals the values supporting protection of species that do not depend on human intervention for viability. These bases suggest a more precise definition of the “nature” we seek to protect. Ideally, Congress should ensure that the ESA reflects the value that society assigns to self-sustaining species. Alternatively, the agencies and reviewing courts should recognize the significance of this purpose underlying the ESA.

By refining the law in this instance, we can clarify our conception of humankind’s relationship to nature. Although this Article focuses primarily on one context in which the issue arises, its recommendations have broader implications. Refining the ESA’s purposes and application as suggested here is an appropriate reflection of evolving social values. It will advance a clearer understanding of the law’s role in regulating human impact and conserving the “nature” upon which we all depend.