

STATE FISH STOCKING PROGRAMS AT RISK: TAKINGS UNDER THE ENDANGERED SPECIES ACT

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“If these ‘environmentalists’ really wanted to help the poor animals, they would commit suicide to leave more room.”¹

Anyone who yawns at the mention of “fish stocking” may be oblivious to the fact that it can elicit such an intense response, especially from a fisherman. Fish stocking, raising fish in a hatchery and placing those non-native fish into a water body, has been in practice for over a hundred years.² The primary purposes of fish stocking include the following: (1) mitigating declines of fish populations caused by federal water projects;³ (2) helping to recover fish species listed on the Endangered Species Act;⁴ and (3) providing wildlife-oriented recreational opportunities like fishing.⁵ In the case of U.S. Pacific salmon, “[h]atchery programs generally have two goals which can conflict with one another: to increase the number of salmon available for fishing, and to prevent natural salmon from becoming extinct.”⁶

While the virtues of supplementing wild populations of fish are often extolled, scientific studies have indicated that fish stocking can

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1. Ted Williams, *Got Trout?*, FLY ROD & REEL, Apr. 2009, at 18, available at http://www.myfrog.info/pdfs/FRR_gottrout.pdf.

2. See U.S. Fish & Wildlife Serv., Fisheries and Habitat Conservation, <http://www.fws.gov/fisheries/fisheries.html> (last visited Dec. 26, 2009) (discussing how U.S. Commission of Fish and Fisheries were charged in 1872 with “supplementing declining native stocks of coastal and lake food fish through fish propagation.”).

3. U.S. Fish & Wildlife Serv., National Fish Hatchery System, <http://www.fws.gov/fisheries/nfhs/> (last visited Dec 26, 2009).

4. *Id.*

5. *Id.*

6. *Trout Unlimited v. Lohn*, 559 F.3d 946, 948 (9th Cir. 2009).

harm the wild, native species of the water body.⁷ Reports have established the propensity of hatchery fish to out-compete the native fish for food sources,⁸ the frequency of hatchery fish to feed on the native species,⁹ the transmission of disease,¹⁰ and the dilution of the native fish gene pool through mating of the hatchery and native fish.¹¹ The National Park Service has heeded this scientific data and has banned fish stocking in all of the National Parks.¹² Yet there is a

7. See, e.g., GENE S. HELFMAN, *FISH CONSERVATION: A GUIDE TO UNDERSTANDING AND RESTORING GLOBAL AQUATIC BIODIVERSITY AND FISHERY RESOURCES* 422 (2007) (citing R.R. Reisenbichler & S.P. Rubin, *Genetic Changes from Artificial Propagation of Pacific Salmon Affect the Productivity and Viability of Supplemented Populations*, 56 ICES J. MARINE SCI. 459, 459 (1999), which concludes that supplementation programs degraded wild strains and that “artificial propagation poses a genetic threat to conservation of naturally spawning populations”); *id.* at 432 (citing R.S. Waples, *Dispelling Some Myths about Hatcheries*, 24 FISHERIES 12 (1999), which concludes that hatcheries have many adverse effects on wild fishes); C. Boydston et al., *Nonindigenous Fish*, available at http://biology.usgs.gov/status_trends/static_content/documents/olrdocs/Nonative.pdf (examining issues that arise with the introduction of nonindigenous fish).

8. See Robert T. Lackey, *Fisheries: History, Science, and Management*, in *WATER ENCYCLOPEDIA: SURFACE AND AGRICULTURAL WATER* 121 (Jay H. Lehr & Jack Keely eds., 2005), available at <http://www.epa.gov/wed/pages/staff/lackey/pubs/history.pdf> (“Non-indigenous species often compete with or prey upon commercially or recreationally important fish species”).

9. See Ramon Vandern Brule & Nick Gayeski, *An Overwhelming Body of Evidence: How Hatcheries are Jeopardizing Salmon Recovery*, WASH. TROUT REP., Spring 2003, available at <http://www.washingtontrout.org/Hatchery%20Article.pdf> (claiming that “[b]oth predation and displacement of wild juveniles by hatchery juveniles is occurring in rivers and estuaries throughout the Northwest”).

10. See, e.g., Joseph Kiesecker, *Fish-Stocking May Spread Amphibian Disease*, CONSERVATION MAG., Oct. 2001, available at <http://www.conservationmagazine.org/articles/v2n4/fish-stocking-may-spread-amphibian-disease/>.

11. See HATCHERY SCIENTIFIC REVIEW GROUP, COLUMBIA RIVER HATCHERY REFORM PROJECT, FINAL SYSTEM-WIDE REPORT, APPENDIX A.1: PREDICTED FITNESS EFFECTS OF INTERBREEDING BETWEEN HATCHERY AND NATURAL POPULATIONS OF PACIFIC SALMON AND STEELHEAD 2, available at http://www.hatcheryreform.us/hrp_downloads/reports/columbia_river/system-wide/4_appendix_a_1_interbreeding_fitness_effects.pdf (noting that “[t]he propagation of Pacific salmon and steelhead . . . in hatcheries has raised concerns for more than 30 years regarding the long-term genetic effects of hatchery-origin fish on the mean fitness of natural populations”); UC DAVIS CTR. FOR WATERSHED SCIS., SALMON, STEELHEAD, AND TROUT IN CALIFORNIA: STATUS OF AN EMBLEMATIC FAUNA 142 (2008), available at <http://www.caltrout.org/SOS-Californias-Native-Fish-Crisis-Final-Report.pdf> (estimating that the fitness, i.e. ability to produce young that survive to reproduce, of steelhead decreases almost 40% per generation of hatchery culture).

12. The last hold-out was the North Cascades National Park. The National Park Service indicated that if Congress did not explicitly authorize fish stocking in the Cascades by July 1, 2009, the practice would be banned. On June 2, 2009, the House of Representatives passed H.R. 2430, to direct the Secretary to continue fish stocking in certain North Cascades lakes, but the Senate failed to pass the bill. See also National Parks Traveler, *Stocking of Non-Native Fish at North Cascades National Park Comes to a Halt* (July 3, 2009),

federal hatchery system designed to research and implement fish stocking across the country,¹³ and fish stocking is in full force in over thirty-five of the fifty U.S. states.¹⁴

For many years, fish stocking has flown relatively low on the legal radar screen.¹⁵ But one case brought by environmental organizations in California may change that. In 2006, the Pacific Rivers Council and the Center for Biodiversity brought suit against the California Department of Fish and Game (DFG) under California's "little NEPA (National Environmental Policy Act)," the California Environmental Quality Act (CEQA), for failure to consider the effects of fish stocking on native populations.¹⁶ Included in the evidence against the state agency were expert affidavits and reference to over 100 scientific studies attesting to the harms of trout stocking on native populations.¹⁷ The plaintiffs specified twenty-five

<http://www.nationalparkstraveler.com/2009/07/stocking-non-native-fish-north-cascades-national-park-comes-halt> (discussing stocking of non-native fish species in national parks).

13. See U.S. Fish & Wildlife Serv., *supra* note 3.

14. G. Edwards and J. Nickum, *Use of Propagated Fishes in Fish and Wildlife Service Programs* 22 U.S.-JAPAN AQUACULTURE PANEL SYMP. (1993), available at <http://www.lib.noaa.gov/japan/aquaculture/report22/edwards.html>; see also Fishintrips.net, Fish Stocking Reports, available at <http://www.fishintrips.net/StockReports.html>.

15. See *Colo. River Water Conservation Dist. v. Andrus*, 476 F.Supp. 966, 970 (D. Co. 1979) (Endangered Species Act suit against Utah officials for violating section 9 with fish stocking dismissed for lack of jurisdiction); *In re Operation of the Mo. River System Litig.*, 363 F.Supp.2d 1145, 1169, n. 13 (D. Minn. 2004) (holding for Fish and Wildlife Services and states against section 9 Endangered Species Act suit for fish stocking where plaintiffs failed to respond to defendants' motions on the issue).

16. *Pac. Rivers Council v. Cal. Dep't of Fish & Game*, No. 06 CS 01451 (Cal. Sup. Ct. Nov. 24, 2008).

17. Plaintiffs allege that the stocking of hatchery-reared fish significantly reduced populations of threatened and endangered fish and amphibians; resulted in hybridization that can permanently genetically alter or effectively eliminate populations of threatened and endangered wild trout and salmon; introduced diseases and invasive species that adversely affect native fauna; and negatively impacted native ecosystems and food webs. Plaintiff's Memorandum of Points and Authorities in Support of Petitioners' Response to Respondent's Motion for Modification of Judgment and Peremptory Writ at 3, *Pac. Rivers Council v. Cal. Dep't of Fish & Game*, No. 06 CS 01451 (Cal. Sup. Ct. Nov. 24, 2008).

fish and amphibians at risk,¹⁸ including sixteen endangered or threatened species.¹⁹

After two years of litigation, the California Superior Court required the DFG to comply with CEQA and prepare an environmental assessment.²⁰ While the state prepared its assessment, the court ordered interim measures that limit DFG's ability to stock fish where monitoring surveys have demonstrated the presence of certain sensitive native aquatic and amphibian species, or where monitoring surveys for these species have not yet been conducted—approximately 175 lakes and streams in California.²¹ In early 2010, the state issued its final environmental assessment, which assessed impacts of the state's fish stocking operations, as well as the hatchery operations and the issuance of Private Stocking Permits.²² The environmental assessment recommends a preferred alternative of continued fish stocking for recreational purposes with DFG implementing guidelines that allow for some protection of native species.²³ The environmental assessment identifies over fifty potentially significant effects and includes mitigation measures to “reduce the impacts to less than significant.”²⁴ Notably, the state acknowledged that even with the proposed actions, some impacts on protected species, such as the “significant adverse competition, predation, non-target harvest, or genetic effects of current hatchery operations” on native salmon and steelhead evolutionary significant

18. See CTR. FOR BIOLOGICAL DIVERSITY, PACIFIC RIVERS COUNCIL AND CENTER FOR BIOLOGICAL DIVERSITY STATEMENT ON INTERIM RESTRICTIONS ON STOCKING OF TROUT TO PROTECT NATIVE FISH AND AMPHIBIANS IN CALIFORNIA WATERS (2008), available at http://www.biologicaldiversity.org/campaigns/fish-stocking_reform/pdfs/PRC+CBD_statement_on_fish-stocking_agreement.pdf (discussing scientific studies of species affected by trout stocking).

19. U.S. Fish & Wildlife Serv., Species Listed in California Based on Published Population Data, available at http://ecos.fws.gov/tess_public/pub/stateListingIndividual.jsp?state=CA&status=listed.

20. California Department of Fish and Game, U.S. Fish and Wildlife Service, Draft Hatchery and Stocking Program Environmental Impact Report/Environmental Impact Statement Executive Summary 2 (September 2009), available at <http://www.dfg.ca.gov/news/pubnotice/hatchery/>.

21. *Id.*

22. California Department of Fish and Game, DFG Hatchery Operations Environmental Impact Report (EIR)/Environmental Impact Statement (EIS), available at <http://www.dfg.ca.gov/news/pubnotice/hatchery/>.

23. California Department of Fish and Game, U.S. Fish and Wildlife Service, Final Hatchery and Stocking Program Environmental Impact Report/Environmental Impact Statement ES-11 (January 2010), available at <http://www.dfg.ca.gov/news/pubnotice/hatchery/>.

24. *Id.* tbl.ES-2 and ES-12 (potentially significant impacts include competition and predation by stocked trout and salmon, genetic effects, and distribution of invasive species).

units and native steelhead distinct population segments cannot be reduced to “less-than-significant levels.”²⁵

While this case may lead to similar lawsuits brought against other states with “little NEPAs,”²⁶ state fish stocking programs may also be attacked using the stronger federal Endangered Species Act (ESA).²⁷ Section 9 of the ESA subjects any person to liability for “taking” a protected species where an action results in direct or indirect harm to a protected species or its habitat.²⁸ Whereas a direct taking of a protected species through hunting, shooting, or killing the animal is relatively straightforward, the standards for an indirect taking through “harm” to habitat are much more muddled. The Secretary of the Interior includes the following in the definition of “harm”: “significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.”²⁹

A section 9 ESA claim for fish stocking requires resolution of at least two³⁰ important unanswered questions about the application of a taking based on habitat modification. First, it requires a resolution of whether the “actual injury” prong of the harm test can be satisfied with injury to a population instead of an identifiable individual animal.³¹ Second, it requires resolution of the appropriate burden of

25. *Id.* app.K-3.

26. There are 16 states with little NEPAs to date. *See* Council on Env'tl Quality, State Environmental Planning Information, <http://ceq.hss.doe.gov/NEPA/regs/states/states.cfm> (last visited Dec. 26, 2009) (listing states with environmental planning laws similar to NEPA, which also includes the District of Columbia, Guam, Puerto Rico, and members of the Tahoe-Sierra Compact).

27. Endangered Species Act of 1973, 16 U.S.C. §§ 1531-1544 (2006).

28. 16 U.S.C. § 1538(a)(1)(B) (2006); 50 C.F.R. § 17.31(a) (2008).

29. 50 C.F.R. § 17.3 (2008). Notably, the U.S. Fish and Wildlife has expanded their definition of essential behavioral patterns to include “breeding, spawning, rearing, migrating, feeding or sheltering.” 50 C.F.R. § 222.102 (2008).

30. Another article could be devoted to a third issue - what Professor Rasband has termed “multiple habitat modifiers.” *See* James R. Rasband, *Priority, Probability, and Proximate Cause: Lessons from Tort Law About Imposing ESA Responsibility for Wildlife Harm on Water Users and Other Joint Habitat Modifiers*, 33 ENVTL. L. 595, 598 (2003). Although the Supreme Court has indicated that application of the take provision appears to be subject to “ordinary requirements of proximate causation and foreseeability,” *Babbitt v. Sweet Home Chapter of Cmty. for a Greater Or.*, 515 U.S. 687, 697 n.9 (1995), many of the habitat modification cases involve more than one cause. The habitat of endangered trout, for instance, is often modified by not only fish stocking, but water diversion projects, droughts, and other human and natural interference.

31. *See* 50 C.F.R. § 17.3 (2008); *see also* S. Quarles & T. Lundquist, *When Do Land Use Activities “Take” Listed Wildlife Under ESA Section 9 and the “Harm” Regulation?*, SK056 ALI-

proof required to establish an injury through “significant impairment.”³²

Part I of this article provides a brief background to fish stocking practices in the United States, including a discussion of beneficial fish stocking practices, as well as some of the allegations surrounding the detrimental effects. Part II of this article provides some necessary background on section 9 of the ESA, the “actual injury” prong, the “significant impairment” prong, and their application to fish stocking.

Part III of this article sets forth recommendations for future clarification and increased consistency on these issues. Specifically, this article supports the use of two rules that can help reconcile the uncertain landscape surrounding a taking based on habitat modification. First, “actual injury” should be found where there is injury to either an individual or a population of protected species. Second, the degree of proof required to establish an “injury” where essential behaviors are impaired should be bifurcated into two tests, depending on which behavioral pattern is being adversely affected. Together, these rules can bring resolution not only to scenarios like fish stocking, but also to other future fact patterns scrutinized under the habitat modification analysis.

Part IV of this article demonstrates how application of these rules to states can further the goals of the ESA, both through voluntary reevaluation of fish stocking programs, and through application for an Incidental Take Permit and corresponding Habitat Conservation Plan. These rules can provide two different paths to the same goal: to minimize adverse impacts to endangered and threatened species.

I. FISH STOCKING

For over a century in the United States, people have been stocking lakes and rivers with non-native fish.³³ For years, this

ABA 107, 123 (agreeing that “[a]ctual injury or death of wildlife and impairing essential behavioral patterns seem to be separate prerequisites for harm.”).

32. See 50 C.F.R. § 17.3 (2008).

33. See, e.g., Lee Newman, U.S. Fish & Wildlife Serv., *The Grand Portage Project: A Successful Model for the Reintroduction of Lake Superior Coaster Brook Trout Populations*, <http://www.fws.gov/midwest/ashland/grndport.html> (“Attempts have been made to restore coaster populations in Lake Superior by stocking fingerling and yearling hatchery brook trout on a sporadic basis for more than 100 years.”) (last visited Dec. 26, 2009); see also Pa. Fish & Boat Commission, *PA State Fish Hatcheries: Engines for Rural Economic Development*, available at <http://www.fish.state.pa.us/hatchinfsm.pdf> (describing a legislative act in 1873 that established Pennsylvania’s first fish hatchery).

seemed like the sensible thing to do. It provided anglers with ample fishing opportunities and fisherman with ample bounty without depleting the native fish population.

The federal government has supported fish stocking for recreational purposes for over a hundred and thirty years. In 1871, Congress created a National Fish Hatchery System whose original purpose was to develop hatchery fish populations that could replace depleted fish populations, establish fish populations for specific management needs, and provide new and expanded recreational opportunities.³⁴ Over the last century, over 200 federal fish hatcheries have been constructed and operated in forty-eight states.³⁵ Currently, the National Fish Hatchery System includes seventy hatcheries in thirty-five states that produce more than sixty different species of fish, seven Fish Technology Centers, nine Fish Health Centers, and one Historical National Fish Hatchery.³⁶

Over time, the federal hatcheries have become outnumbered by state hatcheries. For instance, the state of Washington has ten federal hatcheries and ninety-one state hatcheries to “provide sustainable fisheries and meet the state’s tribal treaty obligations.”³⁷ And the state of Oregon has two federal hatcheries compared to thirty-three state hatcheries.³⁸

Fish stocking has many admirable goals, including rehabilitation of stressed populations, mitigation of effects of water projects, and provision of recreational opportunities for anglers. In 2008, for example, environmentalists claimed a critical victory for one of America’s most critically endangered species, the Rio Grande silvery minnow.³⁹ On December 17, 2008, U.S. Fish and Wildlife Service (FWS) released more than 430,000 hatchery-raised fish into former habitat in the Big Bend region of west Texas.⁴⁰ FWS “plans to release additional fish there over the next four years to establish an

34. U.S. Fish & Wildlife Serv., *supra* note 3.

35. Edwards & Nickum, *supra* note 14, at 42.

36. U.S. Fish & Wildlife Serv., National Fish Hatcheries, <http://www.fws.gov/fisheries/nfhs/offices.html> (last visited Dec. 26, 2009).

37. Wash. Dep’t of Fish & Wildlife, Fact Sheet: The Dual Role of Washington’s Hatcheries: Conservation of Wild Stocks, Sustainable Fisheries (2000), <http://wdfw.wa.gov/factsheets/hatcheries.htm>; *see also* U.S. Fish & Wildlife Serv., *supra* note 36.

38. U.S. Fish & Wildlife Serv., *supra* note 36; Or. Dep’t of Fish & Wildlife, Hatchery Information, <http://www.dfw.state.or.us/fish/hatchery/> (last visited Dec. 26, 2009).

39. *See* U.S. Fish & Wildlife Serv., Endangered Species Program, Silvery Minnows Return to Texas, http://www.fws.gov/Endangered/home_stories/silvery_minnows.html (last visited Dec. 26, 2009).

40. *Id.*

experimental, self-sustaining wild population in the lower Rio Grande.”⁴¹ And in the case of Idaho’s Dworshak Dam, the U.S. Army Corps of Engineers constructed the Dworshak National Fish Hatchery, the largest steelhead hatchery in the world, to mitigate for fishery losses from the construction and operation of the dam.⁴²

But during the last decade, mounting evidence suggests that these non-native fish are negatively impacting the native fish and amphibian species.⁴³ The Congressionally established Hatchery Scientific Review Group (HSRG) determined that in the Columbia River Basin in the Pacific Northwest “hatchery programs – as currently operated – were contributing to the risks those [threatened or endangered salmon] were facing.”⁴⁴ Hatchery fish are starting to dominate wild fish in many locations,⁴⁵ and scientific studies regarding the harms to native fish populations are growing in abundance.⁴⁶

II. THE ENDANGERED SPECIES ACT

The issue is complicated by the fact that a number of the species affected by hatchery-released fish in the United States are protected under the Endangered Species Act.⁴⁷ There are thirty-four marine

41. *Id.*

42. U.S. Army Corps of Eng’rs, Dworshak Dam and Reservoir, http://www.nww.usace.army.mil/dpn/dpn_project.asp?project_id=43 (last visited Dec. 26, 2009).

43. See *supra* notes 8–11 and accompanying text; see also Murray Carpenter, *On a Hunt for Fishless Lakes, Teeming with Life*, N.Y. TIMES, Apr. 27, 2009, at D2, available at <http://www.nytimes.com/2009/04/28/science/earth/28Lake.html> (focusing on the negative impacts of stocking fish in fishless lakes in Maine).

44. HATCHERY SCIENTIFIC REVIEW GROUP, REPORT TO CONGRESS ON COLUMBIA RIVER BASIN HATCHERY REFORM 3 (2009), available at http://www.hatcheryreform.us/hrp_downloads/reports/columbia_river/report_to_congress/hsrg_report_12.pdf.

45. See, e.g., U.S. Fish & Wildlife Serv., Northeast Fishery Center: Recent Projects of the Population Ecology Branch, http://www.fws.gov/northeast/fisherycenter/popeco_projects.html (last visited Dec. 26, 2009) (noting that the Northeast Fishery Center’s program of “[h]atchery propagation and stocking of American shad represent a large component of restoration efforts in the Susquehanna River. In a subsample of the returning adult population at Conowingo Dam in 2003, approximately 26% of the adults were of wild origin, and 74% were of hatchery origin.”).

46. See HELFMAN, *supra* note 7.

47. See, e.g., CAL. TROUT, SOS: CALIFORNIA’S NATIVE FISH CRISIS 38–39, 50–51 (2008), available at <http://www.caltrout.org/SoS-Californias-Native-Fish-Crisis.pdf> (determining that the Southern Oregon/Northern California Coho Salmon and Northern California Coast Summer Steelhead, listed as threatened under the ESA, are both at risk from hatcheries, among other factors); see also Pac. Rivers Council, California’s Aerial Fish Stocking Program Endangers Native Frogs (August 1, 2001), <http://www.pacificrivers.org/about/press/releases/californias-aerial-fish-stocking-program-endangers-native-frogs> (noting impact of over-stocking of fish on the endangered mountain yellow-legged frog).

and anadromous fish listed as threatened or endangered.⁴⁸ Eighteen salamanders are listed as endangered, threatened, or candidate species across California, Arizona, Florida, South Carolina, Georgia, Texas, Virginia, West Virginia, and Alabama.⁴⁹ And the Fish and Wildlife Service has sufficient information to warrant listing for 249 candidate species,⁵⁰ but for which proposed listing regulations are “precluded by other higher priority listing activities.”⁵¹

Promulgated in 1973, the Endangered Species Act recognizes the value in preserving biodiversity.⁵² Section 9 and its regulations make it unlawful for any “person”⁵³ to “take” an endangered or threatened species.⁵⁴ The regulations define “take” broadly: “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.”⁵⁵ The Supreme Court has determined that a take need not be intentional to establish liability under section 9,⁵⁶ and that ESA liability is not limited to direct applications of force against a protected species.⁵⁷ In addition to civil and criminal penalties, injunctive relief is available for violating section 9 of the ESA.⁵⁸

48. Nat'l Oceanic & Atmospheric Admin. Fisheries Serv., Office of Protected Res., Marine/Anadromous Fish Species Under the Endangered Species Act (ESA), <http://www.nmfs.noaa.gov/pr/species/esa/fish.htm> (last visited Dec. 26, 2009).

49. See U.S. Fish & Wildlife Serv., Species Reports, http://ecos.fws.gov/tess_public/SpeciesReport.do (last visited Dec. 26, 2009).

50. U.S. Fish & Wildlife Serv., Species Reports, http://ecos.fws.gov/tess_public/pub/SpeciesReport.do?listingType=C&mapstatus=1 (last visited Dec. 26, 2009).

51. U.S. Fish & Wildlife Serv., Candidate Species: Section 4 of the Endangered Species Act, available at http://www.fws.gov/ENDANGERED/factsheets/candidate_species.pdf.

52. Endangered Species Act of 1973, 16 U.S.C. §§ 1531-1544, 1531(a)(3) and (b) (2006) (finding that the species of fish, wildlife, and plants in danger of or threatened with extinction “are of aesthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people” and that the purpose of the Act is “to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved”).

53. Although much of the analysis surrounding section 9’s “person” definition surrounds its application to private actors, the ESA defines “person” to include “any officer, employee, agent, department, or instrumentality of the Federal Government, of any State, municipality, or political subdivision of a State, or of any foreign government; any State, municipality, or political subdivision of a State; or any other entity subject to the jurisdiction of the United States.” 16 U.S.C. § 1532(13).

54. See 16 U.S.C. § 1538(a) (protecting endangered species); *id.* § 1533(d) (authorizing the Services to extend the take prohibitions of section 9 to threatened species by regulation).

55. 16 U.S.C. § 1532(19) (2006).

56. *Babbitt v. Sweet Home Chapter of Cmty. for a Great Or.*, 515 U.S. 687, 708 (1995).

57. *Id.* at 697.

58. 16 U.S.C. § 1540(g)(1)(A) (2006).

The Secretary of the Interior explains that “harm” in the definition of “take” in the ESA regulations “may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.”⁵⁹ “[H]abitat modification or degradation, standing alone, is not a taking pursuant to section 9.”⁶⁰ The impairment of essential behavioral patterns must be accompanied by an “actual” death or injury to wildlife.⁶¹ In *Babbitt v. Sweet Home Chapter of Communities*, the Supreme Court held that the Secretary of Interior rightly interpreted “harm” to include habitat modification, but left open issues about the precise application of this definition to real-world scenarios.⁶² Two of these ambiguities are at issue in this article.

A. *The Problem with “Actual Injury”*

The first ambiguity lies in the requirement that there be an “actual” death or injury and the difference between injury to an individual protected animal and injury to a population of protected species. The confusion surrounding this issue can be conflated with the level of proof required to establish injury. While a wounded or dead protected animal will surely suffice, what are courts to do when there is no proverbial “dead body” of a protected species available as proof of harm? Prior to the Supreme Court’s opinion in *Sweet Home*, lower courts had taken a relatively broad view of “actual harm,” rejecting arguments that “actual injury” requires: (1) evidence of actual death of individual members of the protected species,⁶³ or (2) threatened extinction of a species.⁶⁴ In one of the earlier decisions on this issue, the Federal District Court of Hawaii stated:

[a] finding of “harm” does not require death to individual members of the species; nor does it require a finding that habitat degradation

59. 50 C.F.R. § 17.3 (2008).

60. Endangered and Threatened Wildlife and Plants; Final Redefinition of “Harm,” 46 Fed. Reg. 54, 748 (1981).

61. *Sweet Home*, 515 U.S. at 703–4.

62. *See id.* at 695, 699–700. This is one limitation of facial challenges, such as the one brought in *Sweet Home*.

63. *See, e.g., Palila v. Haw. Dep’t of Land and Natural Res.*, 649 F.Supp. 1070, 1075 (D. Haw.1986), *aff’d*, 852 F.2d 1106 (9th Cir. 1988).

64. *See Swan View Coal., Inc. v. Turner*, 824 F. Supp. 923, 938 (D. Mont. 1992). Notably, the District Court of Hawaii resurrected the “extinction” test when it denied summary judgment where “it is not certain that lobster plays such an essential role in the monk seal diet that a reduction of lobster prey dooms the monk seal to extinction.” *Greenpeace Found. v. Mineta*, 122 F. Supp. 2d 1123, 1134 (D. Haw. 2000).

is presently driving the species further toward extinction. Habitat destruction that prevents the recovery of the species by affecting essential behavioral patterns causes actual injury to the species and effects [sic] a taking under section 9 of the Act.⁶⁵

Unfortunately, the Supreme Court did not make clear whether actual injury to the *population* is sufficient to satisfy this element or whether actual injury to an individual member of a species is required. In a footnote, however, the Court appears to reject an interpretation of a taking that applies only to “some creature,” as opposed to a “species.”⁶⁶ The Court states that limiting a take to an exercise of power over an animal “ill serves the statutory text, which forbids not taking ‘some creature’ but ‘taking any [endangered] species.’”⁶⁷ And in his dissent, Justice Scalia highlights that the Final Redefinition of “Harm” accompanying the final regulation states that “harm” refers to “injury to a population.”⁶⁸ In this regulation, the Secretary of Interior states that “harm” is not limited to “direct physical injury to an individual member of the wildlife species.”⁶⁹ Interpreted in this light, this regulation can be interpreted to mean that the “actual” injury prong can be satisfied without a “dead body.”

But Justices in both the concurring and dissenting *Sweet Home* opinions are reluctant, and adamantly opposed, respectively, to an interpretation that allows harm to a population to satisfy the actual injury requirement where habitat modification or degradation is at issue. Justice O’Connor explicitly indicates that, from her perspective, “the harm regulation applies where significant habitat modification . . . causes actual death or injury to identifiable animals.”⁷⁰ And Justice Scalia, in dissent, points to the regulation’s inclusion of injury to populations as the “most important unlawful feature of the regulation.”⁷¹ His problem is that the regulation “encompasses injury inflicted, not only upon individual animals, but upon populations of the protected species.”⁷² The majority appears to

65. *Palila*, 649 F. Supp. at 1075.

66. *See Sweet Home*, 515 U.S. at 697 n.10.

67. *Id.*

68. *Id.* at 716 (Scalia, J., dissenting).

69. Endangered and Threatened Wildlife and Plants; Final Redefinition of “Harm,” 46 Fed. Reg. 54, 748 (1981).

70. *Sweet Home*, 515 U.S. at 713 (O’Connor, J., concurring).

71. *Id.* at 716 (Scalia, J., dissenting).

72. *Id.*

agree, stating in a footnote that the dissent was incorrect to suggest the regulation fails “to require injury to particular animals.”⁷³

Section 9 habitat modification cases subsequent to *Sweet Home* generally have evoked the individual versus population debate in the context of requests for injunctive relief.⁷⁴ And although the Supreme Court stated that “[section] 9 cannot be enforced until a killing or injury has occurred,”⁷⁵ that has not prevented lower courts from granting injunctive relief even where a harm has yet to occur. Rejecting the Supreme Court’s statements to the contrary as dictum, the Ninth Circuit granted an injunction even where there had been no previous injury so long as the plaintiff could demonstrate a “reasonably certain threat of imminent harm to a protected species.”⁷⁶

Many courts have found injury to a population as sufficient “actual injury.”⁷⁷ As two scholars have noted, where injunctions are sought against “future conduct – most commonly indirect harm through habitat destruction – the actual focus of the judicial inquiry shifts from injury of individual species members to conservation of the entire species or species populations.”⁷⁸ Under the “reasonably certain” test, some courts appear to accept proof of either individual deaths or injuries *or* a “general decline in the population.”⁷⁹ Even the First Circuit’s more stringent pre-*Sweet Home* approach appears to

73. *Id.* at 700 n.13.

74. *Marbled Murrelet v. Babbitt*, 83 F.3d 1060, 1066 (9th Cir. 1996), *cert. denied*, 519 U.S. 1108 (1997) (preliminary injunction granted); *Hawksbill Sea Turtle v. Fed. Emergency Mgmt. Agency*, 11 F. Supp. 2d 529, 554 (D.V.I. 1998) (preliminary injunction denied); *Defenders of Wildlife v. Bernal*, 204 F.3d 920, 922 (9th Cir. 1999) (permanent injunction denied); *United States v. W. Coast Forest Res. Ltd.*, No. CIV. 96-1575-HO, 2000 WL 298707, at *6 (D. Or. Mar. 13, 2000) (permanent injunction denied); *San Carlos Apache Tribe v. United States*, 272 F. Supp. 2d 860, 868 (D. Ariz. 2003) (preliminary injunction denied); *Seattle Audubon Soc’y v. Sutherland*, 2007 WL 2220256, at *17 (W.D. Wash. 2007) (preliminary injunction denied in part and granted in part).

75. *Sweet Home*, 515 U.S. at 688.

76. *Marbled Murrelet*, 83 F.3d at 1066 (holding that *Sweet Home* did not overrule the “reasonably certain” test articulated in *Forest Conservation Council v. Rosboro Lumber Co.*, 50 F.3d 781, 784–785 (9th Cir. 1995)).

77. *See id.*; *see also Palila v. Haw. Dep’t of Land & Natural Res.*, 852 F.2d 1106 (9th Cir. Haw. 1988); *Palila v. Haw. Dep’t of Land & Natural Res.*, 639 F.2d 495 (9th Cir. Haw. 1981) (finding “actual injury” without a dead or injured individual bird, but with evidence of harm to population).

78. Federico Cheever & Michael Balster, *The Take Prohibition in Section 9 of the Endangered Species Act: Contradictions, Ugly Ducklings, and Conservation of Species*, 34 ENVTL. L. 363, 372 (2004).

79. *Hawksbill Sea Turtle*, 11 F. Supp. 2d at 554 (finding that plaintiffs provided no evidence of any general decline in the population of the Tree Boa); *see, e.g., Swan View Coal. v. Turner*, 824 F. Supp. 923 (D. Mont. 1992) (relying on grizzly bear population decline).

accept actual injury to a population as opposed to only actual injury to an identifiable member of a protected species.⁸⁰

While other courts have not explicitly rejected proof of injury to protected populations, the analyses have focused on actual harm to individuals. One lower court has elaborated on the “reasonably certain threat of imminent harm” test, requiring either a “dead body” or proof of proximity of the “endangered or threatened *animal*” to the challenged action to demonstrate “actual injury.”⁸¹

Some courts have used an “impairment of recovery” theory, where proof that the “habitat degradation prevents, or possibly, retards, recovery of [the] species” is sufficient to issue an injunction.⁸² One might predict that this theory would focus on injury to the population, but in both cases using this theory, the courts focused on individual harms.⁸³ In rejecting the “impairment of recovery” theory, a lower court again focused on individual harm, noting the “threat of actual injury to *these owls*” detected in four project areas.⁸⁴

The same treatment can be seen where injunctions are not at issue. In an appeal of a summary judgment determination, the Ninth Circuit focuses on the lack of a causal connection between the challenged actions and the one specific eagle “Ridge nest” that failed to reproduce.⁸⁵

B. The Problem of Determining When “Significant Impairment” Constitutes “Injury”

The second ambiguity at issue in this article lies in the requirement that the impairment of the essential behavioral pattern be significant. Specifically, it is unclear how much impairment of behavioral patterns is sufficient to constitute injury and a taking under the habitat modification clause. “Significant” is not defined in

80. *American Bald Eagle v. Bhatti*, 9 F.3d 163, 166 (1st Cir. 1993) (noting cases where there was harm to “the species.”).

81. *Protect Our Water v. Flowers*, 377 F. Supp. 2d 844, 880–81 (E.D. Cal. 2004) (emphasis added) (finding that protected species in the “vicinity” is not enough where there was no evidence of the animals “at the project site”).

82. *United States v. W. Coast Forest Res. Ltd.*, No. CIV. 96-1575-HO, 2000 WL 298707, at *15 (D. Or. Mar. 13, 2000) (citing *Nat’l Wildlife Fed’n v. Burlington N. R.R.*, 23 F.3d 1508, 1513 (9th Cir. 1994)).

83. *See id.* at *5 (analysis focused on injury to one “owl pair”); *see also Nat’l Wildlife Fed’n*, 23 F.3d at 1512 (finding no evidence of “deaths of *members* of a protected species” (emphasis added)).

84. *Seattle Audubon Soc’y v. Sutherland*, 2007 WL 2220256, at *15–16 (W.D. Wash. 2007) (emphasis added).

85. *Cold Mountain v. Garber*, 375 F.3d 884, 889–890 (9th Cir. 2004).

the ESA or regulations, but essential behavioral patterns include three primary needs of the species: “breeding, feeding, or sheltering.”⁸⁶ As Justice O’Connor remarked, “[b]reeding, feeding, and sheltering are what animals do.”⁸⁷

Breeding took prominence in the *Sweet Home* case. In her *Sweet Home* concurrence, Justice O’Connor took a narrow view of “significant,” suggesting that only “completely preventing breeding” or making it “impossible for an animal to reproduce” would satisfy the requirement of significant impairment that causes actual injury.⁸⁸ As one scholar deftly points out, under her analysis “merely making spawning more difficult . . . would not be enough.”⁸⁹

Justice O’Connor proceeded, however, to identify two other scenarios where mere “interference with breeding” can cause an actual injury. The first is where habitat modification prevents an animal in a “vulnerable breeding state” from fleeing or defending itself.⁹⁰ The second is where environmental pollutants cause an animal to suffer “physical complications during gestation.”⁹¹ Neither of these actions suggest complete impairment is required to establish harm.

The lack of clarity left the lower courts in some disarray. No court has explicitly addressed what constitutes “significant” impairment. In *Marbled Murrelet*, however, the Ninth Circuit found that an increased risk of harm to breeding constituted “significant impairment.”⁹² But district courts have found that making it more difficult for a protected species to find food or shelter does not constitute significant impairment.⁹³

86. 50 C.F.R. § 17.3 (2008).

87. *Babbitt v. Sweet Home Chapter of Cmty. for a Great Or.*, 515 U.S. 687, 710 (1995) (O’Connor, J., concurring).

88. *Id.* (“One need not subscribe to theories of ‘psychic harm’ . . . to recognize that to make it impossible for an animal to reproduce is to impair its most essential physical functions and to render that animal, and its genetic material, biologically obsolete. This, in my view, is actual injury.”).

89. Rasband, *supra* note 30, at 609.

90. *Sweet Home*, 515 U.S. at 710 (O’Connor, J., concurring).

91. *Id.*

92. *Marbled Murrelet v. Babbitt*, 83 F.3d 1060, 1067 (9th Cir. 1996).

93. See *Hawksbill Sea Turtle v. Fed. Emergency Mgmt. Agency*, 11 F. Supp. 2d 529, 554 (D.V.I. 1998); *United States v. W. Coast Forest Res. Ltd.*, No. CIV. 96-1575-HO, 2000 WL 298707, at *5 (D. Or. Mar. 13, 2000); *Greenpeace Found. v. Mineta*, 122 F. Supp. 2d 1123, 1134 (D. Haw. 2000).

C. *Application of Section 9 to Fish Stocking*

In some ways, an analysis of the impacts of fish stocking should be simple. Many of the obstacles discussed in prior analyses, including foreseeability, vicarious liability of state agencies, and injunction of future harms,⁹⁴ are not show-stoppers here. Yet fish stocking is emblematic of a common factual circumstance found in “harm via habitat degradation” cases. There is no individual “dead body” and there is not complete impairment of an individual or population’s essential breeding, feeding, or sheltering patterns.

1. “Actual Injury” From Fish Stocking

Under an interpretation of “actual injury”⁹⁵ that allows for injury to populations, a strong case can be made that the addition of hatchery fish can cause “actual injury” to protected species. The Ninth Circuit recently ruled on the appropriateness of the National Marine Fisheries Service’s (NMFS) decisions regarding the impacts of hatchery-raised salmon on naturally spawned salmon.⁹⁶ In doing so, the court found that hatchery programs pose “risks to the genetic diversity and longterm reproductive fitness of local natural steelhead populations,”⁹⁷ including: (1) “excessive mortality of natural steelhead in fisheries targeting hatchery-origin steelhead; (2) “competition for prey and habitat”; (3) predation by hatchery-origin fish on younger natural fish”; (4) “genetic introgression by hatchery-origin fish that . . . interbreed with local natural populations”; (5) “disease transmission”; (6) “degraded water quality and quantity”; and (7) “impediments to fish passage imposed by hatchery facilities.”⁹⁸ Scientific studies would likely be able to demonstrate similar findings, and perhaps show a population decline where fish stocking occurs or a population increase where fish stocking has been abandoned.⁹⁹

Nevertheless, a claim could fail if a court were to require actual death or injury to one, identifiable protected fish or salamander. It is unlikely that there is one identifiable fish that was injured as a result of fish stocking. Each of the injuries alleged fails to provide the

94. See, e.g., Paul Boudreaux, *Understanding “Take” in the Endangered Species Act*, 34 ARIZ. ST. L.J. 733 (2002).

95. See *supra* notes 59-62 and accompanying text.

96. *Trout Unlimited v. Lohn*, 559 F.3d 946 (9th Cir. 2009).

97. *Id.* at 948 (citation omitted).

98. *Id.* at 948-949 (citing National Oceanic and Atmospheric Administration, Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead, 71 Fed. Reg. 834, 856 (Jan. 5, 2006)).

99. See, e.g., Ted Williams, *supra* note 1.

desired “dead body.” Stocking hatchery-raised individuals into a body of water that contains a naturally occurring protected population of the same species may result in the dilution of the protected population’s gene pool. Though genetic dilution does not injure an individual of the naturally occurring population per se, it can cause harm on the population level.¹⁰⁰ Injecting new competitors for food and habitat does not lend itself to capturing evidence of a native fish losing out to a hatchery fish.¹⁰¹ And it is difficult to document whether hatchery-raised fish are out-competing naturally occurring individuals for food, or if hatchery-raised fish are preying on naturally occurring individuals and their young. As a result, an Endangered Species Act claim regarding fish stocking practices is most likely to succeed where a court is amenable to the argument that injury to a population is sufficient for actual injury.

2. “Significant Impairment” of Essential Behavior Patterns From Fish Stocking

Similarly, under an interpretation of “significant impairment”¹⁰² that acknowledges partial impairment of essential behavioral patterns, a strong case can be made that the addition of hatchery fish can significantly impair the breeding or feeding of protected populations. For instance, the pleadings in the CEQA fish stocking case allege the following breeding impairment:

When hatchery trout interbreed with a wild trout population, the addition of genes from the hatchery fish renders that population ‘genetically extinct.’ [citation omitted]. The population ceases to exist as a true genetic component of the species and becomes an amalgam of two different species, with an irreversibly clouded genetic legacy, loss or distortion of local adaptations, an uncertain ability to adapt to future conditions, and negligible ability to contribute to the survival of the indigenous species. [citation omitted] The Department’s staff admit that stocking has already caused this problem: ‘Because of the hybridized condition of these

100. See HATCHERY SCIENTIFIC REVIEW GROUP, *supra* note 11, at 2 (noting the difficulties in detecting the genetic risks to natural populations of Pacific salmon and steelhead that exist from natural spawning of hatchery fish).

101. See HATCHERY SCIENTIFIC REVIEW GROUP, COLUMBIA RIVER HATCHERY REFORM PROJECT, FINAL SYSTEM-WIDE REPORT, APPENDIX A.7: OUTPLANTING AND NET PEN RELEASE OF HATCHERY-ORIGIN FISH 3, available at http://www.hatcheryreform.us/hrp_downloads/reports/columbia_river/systemwide/4_appendix_a_7_outplanting_and_netpen_releases.pdf (“[H]atchery summer steelhead adults and their offspring may have contributed to wild winter steelhead population declines through competition for spawning and rearing habitats.”).

102. See *supra* notes 92–93 and accompanying text.

golden trout, fish in this location, in my opinion, will not contribute to the long-term conservation and restoration of California golden trout.’ [citation omitted]¹⁰³

While not a complete prevention of breeding, these allegations establish that fish stocking has disrupted the normal reproduction of the protected species. One could argue that because the normal reproduction of protected fish has been negatively disrupted, the protected fish population has been injured, resulting in a taking.

Nevertheless, a claim could fail if a court were to require complete impairment, as suggested by Justice O’Connor. Injecting new mates into the waterbody does not completely prevent the native fish from breeding. And injecting new competitors for food sources does not completely impair the native fish from feeding. It merely adds an additional stressor on an already stressed population. Nevertheless, even though significant impairment is open to interpretation, reducing such stressors to preserve the ability of native populations to survive fits squarely within the goals of the ESA.¹⁰⁴

III. RECOMMENDATIONS FOR ACTUAL INJURY AND SIGNIFICANT IMPAIRMENT

Adoption of two key recommendations can both bring consistency to these muddied waters and bring the results closer to the purposes of the ESA.¹⁰⁵ First, the “actual injury” prong of the harm test should be satisfied where there is injury to either an individual or a population of protected species. Second, the degree of proof required to establish an “injury” where essential behaviors are impaired should be bifurcated into two tests, depending on which behavioral pattern is being adversely affected.

A. *Injury to a Protected Population Should Be Sufficient to Establish “Actual Injury”*

First, the “actual injury” prong of the harm test should be satisfied where there is injury to either an individual or a population of protected species. This analysis accords with earlier scholars who have argued that injury should consider both individuals and populations.¹⁰⁶ As they have noted, “the words in the definition of

103. Plaintiff’s Memorandum, *supra* note 18, at 7–8.

104. *See Trout Unlimited v. Lohn*, 559 F.3d 946, 957 (9th Cir. 2009) (“[T]he ESA’s primary goal is to preserve the ability of natural populations to survive in the wild.”).

105. *See, e.g., id.* (identifying a primary purpose of the ESA).

106. Cheever & Balsten, *supra* note 78, at 363.

take – harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect – all describe action generally done to individuals.”¹⁰⁷ “Injury to species and populations plays no explicit role.”¹⁰⁸ Regardless, they argue that to remain faithful to the conservation purposes of the ESA, courts must interpret section 9 to apply to populations “to protect species and the ecosystems upon which they depend in order to allow species to recover to the point where they no longer require protection under the Act.”¹⁰⁹

But there is another reason to extend the reach of section 9 to injury to populations. Common sense demands it. Limiting “actual harm” to individual animals would result in a world where a person is liable under section 9 for wounding one wolf in the ear (a minimal injury with little long-term harm to the species), but would have free reign to adversely modify the habitat of the entire population of wolves so long as no single wolf exhibits signs of injury (a more damaging action with long-term harm to the species).

This approach is further supported by the lack of alternative mechanisms in the law to prevent a non-federal activity¹¹⁰ that will impair the essential behavioral functions of a population of endangered species. The two most likely alternatives both have significant limitations. The first, to purchase the habitat under section 5 of the ESA¹¹¹ is dependent on adequate funding. The second, to designate the land as critical habitat, would suffer from substantial delay. The federal wildlife agencies have proved to be overwhelmed administratively with the critical habitat decisions.¹¹² As of December 1, 2005, only 471 of the 1272 listed species have had their requisite critical habitat designation and the FWS has indicated that this is a “low priority” in light of the backlog of species listing decisions.¹¹³

107. *Id.* at 369.

108. *Id.*

109. *Id.* at 396.

110. Section 7 of the ESA, which requires consultation for these population-level effects, fails to hold non-federal actors accountable for activities that jeopardize the existence of a listed species unless there was federal approval of the private activity. 16 U.S.C. § 1536 (2006).

111. Section 5 of the ESA authorizes the Secretary to “acquire by purchase, donation, or otherwise, lands, waters, or interest therein, and such authority shall be in addition to any other land acquisition vested in him.” 16 U.S.C. § 1534(a)(2) (2006).

112. See U.S. Fish & Wildlife Serv., Critical Habitat, What is it?, available at http://www.fws.gov/endangered/pdfs/listing/Critical_Habitat_12_05.pdf.

113. *Id.*

B. Significant Impairment of Breeding Should be Sufficient Proof to Establish Injury

Second, the degree of proof required to establish an “injury” where essential behaviors are significantly impaired should be bifurcated into two tests, depending on which behavioral pattern is being adversely affected. Specifically, courts should apply a presumption of “actual injury” where the *breeding* of a protected individual or population is significantly impaired, even where there is less than complete impairment of reproduction. Alternatively, where the *feeding or sheltering* of a protected individual or population is significantly impaired, the courts can apply a stricter level of proof of injury.¹¹⁴

Of the three behavioral patterns identified by the Secretary of the Interior, impairment of breeding is arguably the most devastating to protected species.¹¹⁵ Where a protected species’ reproduction is disrupted, an entire generation of a species is lost. Furthermore, of the three behavioral patterns, impairment of breeding hits at the root of endangered species protection. Protecting the reproductive function of a species is the primary means to ensure the propagation and/or recovery of a species. An animal that is well-fed with a home does little to serve the goals of the ESA if it is unable or hindered in its ability to reproduce.

Even the common definition of “impair” suggests that Justice O’Connor’s interpretation of impairment of breeding is too narrow. “Impair” is defined as “to damage or make worse by or as if by diminishing in some material respect.”¹¹⁶ Read literally, the regulation therefore requires only that the action significantly worsen breeding, not that the action significantly prevent breeding.

Furthermore, one of the primary arguments against allowing a significant impairment of a behavioral pattern to constitute injury on

114. The test for feeding and sheltering should still fall short of the narrow “complete impairment” test suggested by Justice O’Connor. See *Babbitt v. Sweet Home Chapter of Cmty. for a Greater Or.* 515 U.S. 687, 710 (1995) (O’Connor, J., concurring). Perhaps a “near complete impairment” test could address the efforts of prior courts to focus on whether the disrupted food source or habitat was “essential” to the species. See *e.g.*, *Greenpeace Found. v. Mineta*, 122 F. Supp. 2d 1123, 1133 (D. Haw. 2000).

115. See, *e.g.*, Michael A. Palladino, Male Reproductive Function, <http://www.biologyreference.com/La-Ma/Male-Reproductive-System.html> (last visited Dec. 26, 2009) (“Reproduction is essential for any species to sustain its population. In the simplest sense, the most important function of every living organism is reproduction.”).

116. MERRIAM-WEBSTER ONLINE DICTIONARY, IMPAIR, available at <http://www.merriam-webster.com/dictionary/impairment>.

its own is the ability of animals to adapt.¹¹⁷ Even if the likelihood of harm has been increased by a plaintiff's actions, there is no guarantee of harm. The animals may adapt to a plaintiff's actions in a manner that results in no harm to the individuals or the populations.

This argument is plausible when applied to habitat modification of feeding or sheltering behavior. Nature has repeatedly proven that it is more resilient than we give it credit for. In some cases, it may be just as likely that the animals will be able to find alternative sources of food or move to alternative sources of shelter.

Whereas impairment of feeding and sheltering may not necessarily cause injury to a protected species because they can adapt and find alternative food (depending on availability) and alternative shelter (depending on their mobility), impairment of a breeding and/or natural reproduction rises to a different level because of the enhanced difficulties in adapting to reproductive disruptions. Although one could imagine some nest or den destructions where the animal may be able to relocate to alternative breeding grounds, many of the breeding impairments do not make themselves amenable to adaptation.¹¹⁸

Implicitly, the courts appear to agree with this distinction.¹¹⁹ The only cases where courts have found harm based on habitat modification are where impairment of breeding was at issue.¹²⁰ Where

117. See, e.g., Steven G. Davison, *The Aftermath of Sweet Home Chapter: Modification of Wildlife Habitat as a Prohibited Taking in Violation of the Endangered Species Act*, 27 WM. & MARY ENVTL. L. & POL'Y REV. 541, 578•79 (2003) (noting adaptations available from impairment of feeding, breeding, and sheltering).

118. The courts could allow this presumption to be rebutted by evidence that a specific animal was able to reproduce despite the disruptive activity, as suggested by Professor Davison. *Id.*

119. See also *Boise Cascade Corp. v. U.S.*, 296 F.3d 1339, 1342 n.1 (Fed. Cir. 2002) (noting without analysis or any discussion of attendant injury that “deforestation of breeding habitat constitutes harm under the statute.”).

120. See, e.g., *Marbled Murrelet v. Babbitt*, 83 F.3d 1060, 1067 (9th Cir. 1996), *cert. denied*, 519 U.S. 1108 (1997) (“Thus, under *Sweet Home*, a habitat modification which significantly impairs the breeding and sheltering of a protected species amounts to ‘harm’ under the ESA.”); *Forest Conservation Council v. Rosboro Lumber Co.*, 50 F.3d. 781, 783 (9th Cir. 1995) (“FCC proffered evidence to show that Rosboro's planned timber harvest is reasonably certain to injure the Swartz Creek owl pair by significantly impairing their . . . breeding”); *Swan View Coal. v. Turner*, 824 F. Supp. 923, 936 (D. Mont. 1992) (plaintiffs allege injury to “grizzly bears and gray wolves by significantly impairing their . . . breeding”); *Palila v. Haw. Dep't of Land and Natural Res.*, 649 F.Supp. 1070, 1080 (D. Haw. 1986) (“The mouflon are having a significant negative impact on the mamane forest, on which the Palila is wholly dependent for breeding”). This is not to say that plaintiffs succeed every time impairment of breeding is alleged. Where the courts have rejected these allegations, the plaintiffs failed to provide sufficient proof that the protected animals were present in the affected area, *Seattle Audubon Soc'y v. Sutherland*, 2007

only impairment of feeding or sheltering was at issue, the courts have rejected section 9 habitat modification claims.¹²¹ And at least one court has found injury from breeding impairment where the action caused genetic problems in subsequent woodpecker generations, similar to that alleged in native fish populations stocked with hatchery fish.¹²²

Therefore, although a court may require complete impairment of feeding or sheltering to be significant, a less stringent standard should be applied to actions that impair the reproductive function of a protected species. The standard to be applied should recognize that hindering or slowing reproduction of an individual or a population of protected species creates a presumption of “injury” under the harm provision.¹²³

IV. ALTERNATIVES TO SECTION 9 LIABILITY

Application of these rules is likely to broaden the reach of takings based on habitat modification from fish stocking. This added pressure on states may serve to further the goals of the ESA, both through voluntary reevaluation of fish stocking programs, and through application for Incidental Take Permits and corresponding Habitat Conservation Plans.¹²⁴ Both of these paths would contribute to the same goal: to minimize adverse impacts to endangered and threatened species.

WL 2220256, at *15 (W.D. Wash. 2007) (plaintiff presented no evidence the owls occupy 218 of the sites at issue); that the breeding impacts were caused by the challenged action, *Cold Mountain v. Garber*, 375 F.3d 884, 890 (9th Cir. 2004); or that the breeding was actually negatively impaired by the actions, *San Carlos Apache Tribe v. United States*, 272 F. Supp. 2d 860, 880 (D. Ariz. 2003) (determining that eagle nesting productivity is affected by density of competing eagle nests, not reservoir levels); *W. Coast Forest Res. Ltd.*, No. CIV. 96-1575-HO, 2000 WL 298707, at *5 (D. Or. Mar. 13, 2000) (“[T]he owls maintain relatively high reproductive rates.”).

121. See *Hawksbill Sea Turtle v. Fed. Emergency Mgmt. Agency*, 11 F. Supp. 2d 529, 554 (D.V.I. 1998) (rejecting habitat modification claim because there was no evidence that Tree Boas had died or been injured as a result of changes in their feeding and sheltering patterns); *W. Coast Forest Resources*, 2000 WL 298707, at *5 (rejecting habitat modification where ample food sources existed); *Greenpeace Found. v. Mineta*, 122 F. Supp. 2d 1123, 1132 (D. Haw. 2000) (rejecting habitat modification where ample food sources existed).

122. *Sierra Club v. Lyng*, 694 F. Supp 1260, 1272 (E.D. Tex. 1988), *aff'd in part and vacated in part*, 926 F.2d 429 (5th Cir. 1991) (“Isolation also causes the gene pool to be reduced with fewer birds in a given area, causing genetic problems and abnormalities in the subsequent generations.”); see also Plaintiff’s Memorandum, *supra* note 103.

123. This approach differs from prior interpretations suggested by Quarles & Lundquist, *supra* note 31 (arguing that “reducing breeding success rate at the population level is not take”).

124. See *infra* sections A and B.

A. *Voluntary Reevaluation of Fish Stocking to Minimize Impacts to Endangered or Threatened Species*

States that suspect their actions may trigger section 9 liability can find themselves encouraged to perform a voluntary reevaluation of their fish stocking policies. Such self-assessments are not a new idea. In accordance with a policy committing NMFS and FWS to identify, to the extent possible, those activities that would or would not violate section 9 of the ESA with respect to West Coast Salmon, NMFS included “[r]eleasing non-indigenous or artificially propagated species into a listed species’ habitat or where they may access the habitat of listed species.”¹²⁵ The rule provides that “[p]ersons or entities concluding that their activity is likely to injure or kill protected fish are encouraged to immediately adjust that activity to avoid take (or adequately limit any impacts on the species) and seek NMFS’ authorization for incidental take under: (a) an ESA section 10 incidental take permit; (b) an ESA section 7 consultation; or (c) a limit on the take prohibitions provided in this proposed rule.”¹²⁶

More recently, in February 2009, the Congressionally-established Hatchery Scientific Review group (HSRG) determined that both harvest and hatchery reforms are needed to help salmon and steelhead in the Pacific Northwest.¹²⁷ Taking the lead in this endeavor, the National Oceanic and Atmospheric Administration (NOAA)’s National Marine Fisheries Service (NMFS) has launched the review of over 100 federally funded salmon and steelhead hatchery programs in the Columbia River basin to assure they do not hinder efforts to recover protected fish species.¹²⁸ NOAA will be developing biological opinions to assess whether the federal actions jeopardize the survival of the thirteen “evolutionarily listed units” or “designated population segments” in the Columbia River basin.¹²⁹ The potential for ESA liability may encourage more of such

125. Endangered and Threatened Species; Proposed Rule Governing Take of Four Threatened Evolutionarily Significant Units (ESUs) of West Coast Salmonids: California Central Valley Spring-run Chinook; California Coastal Chinook; Northern California Steelhead; Central California Coast Coho, 66 Fed. Reg. 43,150•54 (August 17, 2001) (codified at 50 C.F.R. pt. 223).

126. *Id.*

127. HATCHERY SCIENTIFIC REVIEW GROUP, *supra* note 44.

128. NOAA to Launch ESA Review of 100 Federally Funded Basin Hatchery Projects, COLUMBIA BASIN BULL., Dec. 12, 2008, <http://www.fishbio.com/home/16-news/269-noaa-to-launch-esa-review-of-100-federally-funded-basin-hatchery-programs.html>.

129. *Id.*

beneficial assessments and result in scientifically appropriate adjustments to fish stocking without the inefficiencies of litigation.

B. Incidental Take Permits

As alluded to above, states can also seek to immunize their fish stocking practices from ESA liability with an Incidental Take Permit (ITP). Section 10(a)(1)(B) of the ESA allows people who determine that their “otherwise lawful activity” will result in the incidental taking of a protected species to apply for an ITP from FWS.¹³⁰ Receipt of an ITP immunizes the person from liability under the ESA.¹³¹ FWS uses five criteria to determine whether to issue the ITP: (1) the taking will be incidental; (2) the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking; (3) the applicant will ensure that adequate funding for the plan will be provided; (4) the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; and (5) the measures, if any, required under [16 U.S.C. § 1539(a)(2)(A)(iv)] will be met; [and][the Service] has received such other assurances as [it] may require that the [habitat conservation plan] will be implemented[.]¹³²

As a prerequisite to receiving an ITP, the applicant must submit a Habitat Conservation Plan (HCP) that specifies “(i) the impact which will likely result from such taking; (ii) what steps the applicant will take to minimize and mitigate such impacts, and the funding that will be available to implement such steps; (iii) what alternative actions to such taking the applicant considered and the reasons why such alternatives are not being utilized; and (iv) such other measures that the Secretary may require as being necessary or appropriate for purposes of the plan.”¹³³

As one scholar has noted, rather than serve to eliminate all actions that would harm species, “section 9 functions as a sorting mechanism to identify those activities that require an incidental take permit before they may proceed.”¹³⁴ This “serves as a mechanism to

130. 16 U.S.C. § 1539(a)(1)(B) (2006).

131. 16 U.S.C. § 1536(o)(2) (2006).

132. 16 U.S.C. § 1539(a)(2)(B) (2006); 50 C.F.R. § 17.22(b)(2) (2008); *id.* § 17.32(b)(2) (2008).

133. 16 U.S.C. § 1539(a)(2)(A). The federal agency’s approval of this ITP constitutes a federal action that triggers section 7 consultation obligations for the federal agency. *See Animal Protection Inst. v. Holsten*, 541 F.Supp.2d 1073, 1076 (D. Minn. 2008).

134. Robert L. Fischman, *The Divides of Environmental Law and the Problem of Harm in the Endangered Species Act*, 83 IND. L.J. 661, 691 (2008).

force dischargers to the negotiating table to acquire permits.”¹³⁵ In the case of fish stocking, the creation of HCPs would allow the states to determine which waterbodies are home to endangered species, identify those species being injured by fish stocking, and selectively adapt the fish stocking programs in a way that maintains the beneficial effects of fish stocking in some areas while minimizing the harm to protected species.

V. CONCLUSION

The political ramifications of reevaluating fish stocking are not to be underestimated. As indicated by the opening line of this article, the fate of fish stocking often pits fishermen against environmentalists and conservation biologists. Fishing is an integral part of the culture of many Americans, as well as the economies of many states. Employment opportunities are dependent on state hatcheries, and “increased enthusiasm for fishing directly affects the state’s sales of sport-fishing licenses.”¹³⁶ Conversely, “[w]hen the state’s ability to stock lakes and rivers with fish dwindles, so does the ability to sell fishing licenses.”¹³⁷

Although it is difficult to change the status quo with respect to a century of fish stocking, particularly one so engrained with political consequences, the state wildlife agencies outside of California may want to heed the warning sent by the California Superior Court and take advantage of the opportunity to reevaluate their fish stocking programs to assess the impact on endangered and threatened species. Piecemeal policies forced by court order without a comprehensive and coordinated approach could lead to inconsistent and inefficient efforts. By being proactive in response to potential ESA litigation, the agencies may be able to take the time to make reasoned adjustments to their fish stocking practices that balance the needs of its wildlife with the desires of its constituents.

135. *Id.*

136. Nicholas Johnson, *Fewer hatcheries means less jobs for Huxley grads*, WESTERN FRONT, Mar. 10, 2009, available at <http://westernfrontonline.net/2009031010797/news/fewer-hatcheries-means-less-jobs-for-huxley-grads/>.

137. *Id.*