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Salmon and the Endangered Species Act: Lessons from the Columbia Basin

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SALMON AND THE ENDANGERED SPECIES ACT: LESSONS FROM THE COLUMBIA BASIN

Michael C. Blumm* & Greg D. Corbin†

Abstract: Within the last decade, the Columbia Basin, once home to the world's largest salmon runs, has witnessed numerous listings of its signature natural resource under the Endangered Species Act (ESA). These listings have propelled the ESA into the forefront of land and water use decisionmaking across a vast landscape of the Pacific Northwest. This Article examines the Columbia Basin salmon listings and their aftermath. Specifically, it considers the effect of the ESA's consultation requirements on hydroelectric, hatchery, harvest, and habitat decisionmaking. The Article draws several lessons from this examination, many of them surprising, including the assertion that the listings have produced many innovations in the implementation of the statute but few improvements in the condition of listed Columbia Basin salmon, due to the persistent sensitivity of consultation process to economic concerns. The Article concludes that this reluctance to disturb ongoing activities damaging salmon does not bode well for the continued existence of the most imperiled of the species, the Snake River runs.

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* Professor of Law and Co-Director, Northwest Water Law and Policy Project, Northwestern School of Law of Lewis & Clark College. For comments on a draft of this Article, we thank our colleague, Dan Rohlf, whose path-breaking book, *The Endangered Species Act: A Guide to Its Protections and Implementation* (1989), remains the standard source on the Endangered Species Act, despite the passage of a decade. This paper was written for the Northwest Water Law and Policy Project.

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I. INTRODUCTION

Pacific salmon are the Northwest’s signature natural resource. Unlike the northern spotted owl, salmon are economically prized, have been the subject of numerous “fish fights” over the years,¹ and were the foundation of the bargain that allowed peaceful settlement of the region.² Columbia River salmon, historically the largest of the Northwest’s salmon runs, have been in decline for over a century due to overharvesting, hydroelectric development, poor hatchery practices, and habitat degradation.³ Lately, however, Columbia River salmon have become the subject of the most expensive biological restoration program in the history of the world.⁴

That restoration program, initiated in 1982, failed to deliver its promise of restoring harvestable runs for a variety of reasons, including flawed design, lack of enforcement, and lack of authority over many harvest management and habitat-damaging activities.⁵ By the early 1990s, the American Fisheries Society’s Endangered Species Committee reported a Pacific Coast-wide salmon crisis: 101 naturally spawning salmon species faced “a high risk of extinction,” another 58 had a “moderate risk of

1. See, e.g., Courtland L. Smith, *Oregon Fish Fights* (Or. St. U. Sea Grant, Pub. No. ORESU-T-74-0041, 1974).

2. See Fay G. Cohen, *Treaties on Trial: The Continuing Controversy over Northwest Indian Fishing Rights* 31, 37–39 (1986); Michael C. Blumm & Brett M. Swift, *The Indian Treaty Piscary Profit and Habitat Protection in the Pacific Northwest: A Property Rights Approach*, 69 U. Colo. L. Rev. 407, 420–33 (1998) [hereinafter Blumm & Swift, *Piscary Profit*].

3. See generally *The Northwest Salmon Crisis: A Documentary History* (Joseph Cone & Sandy Ridlington eds., 1996) [hereinafter *Northwest Salmon Crisis*].

4. The program was authorized by section 4(h) of the Pacific Northwest Electric Power Planning and Conservation Act of 1980, 16 U.S.C. § 839b(h) (1984). See Michael C. Blumm & Andy Simrin, *The Unraveling of the Parity Promise: Hydropower, Salmon, and Endangered Species in the Columbia Basin*, 21 *Envtl. L.* 657, 662–70 (1991) [hereinafter Blumm & Simrin, *Unraveling Parity*].

5. See Blumm & Simrin, *Unraveling Parity*, *supra* note 4, at 711–13, 727–34.

extinction,” and 54 were labeled “of special concern.”⁶ About one-third of these fish runs were native to the Columbia Basin.⁷

This bleak situation prompted the Shoshone-Bannock Tribe to file a petition seeking to list Snake River sockeye under the Endangered Species Act (ESA)⁸ in March 1990. Two months later, a coalition of environmental groups filed petitions seeking to list Columbia Basin spring, summer, and fall chinook, and lower basin coho.⁹ These petitions and the subsequent listings ushered in the era of the ESA in Pacific salmon restoration. The effects are still being felt today. In fact, perhaps no other species has received as much sustained ESA attention over such an immense landscape and waterscape. As of this writing, there are twenty-three salmon runs, referred to by the National Marine Fisheries Service (NMFS) as “evolutionarily significant units,”¹⁰ now listed under the ESA, covering an area from southern California to the Canadian border.¹¹ Among other things,

6. Willa Nehlsen et al., *Pacific Salmon at the Crossroads: Stocks at Risk from California, Oregon, Idaho, and Washington*, 16 *Fisheries* no. 2, at 4–5, 7–8 (1991). Although this report was published in 1991, it was begun in 1987, and pre-publication copies were generally available some time prior to publication. See *Northwest Salmon Crisis*, *supra* note 3, at 296. After publication, the article quickly became one of the most heavily cited publications in the history of the American Fisheries Society. See *id.* at 299.

7. See Nehlsen et al., *supra* note 6, at 10.

8. See 16 U.S.C. §§ 1531–1544 (1994).

9. See *infra* notes 56, 64, 71, and accompanying text; see also Blumm & Simrin, *Unraveling Parity*, *supra* note 4, at 714. Upper basin coho were extinct by 1990. See Nehlsen et al., *supra* note 6, at 14.

10. See *infra* notes 43, 50, and accompanying text.

11. See *infra* note 118 and accompanying text; 55 Fed. Reg. 12,831 (1990) (codified at 50 C.F.R. § 17.11(h) (1998)) (Sacramento River winter-run chinook (emergency listing)); 55 Fed. Reg. 46,515 (1990) (codified at 50 C.F.R. § 227.4(e) (1998)) (Sacramento River winter-run chinook (classified as threatened)); 56 Fed. Reg. 58,619 (1991) (codified at 50 C.F.R. § 222.23(a) (1998)) (Snake River sockeye); 57 Fed. Reg. 14,653 (1992) (codified at 50 C.F.R. § 227.4(g)–(h) (1998)) (Snake River spring/summer chinook and Snake River fall chinook); 59 Fed. Reg. 440 (1994) (codified at 50 C.F.R. § 222.23(a) (1998)) (Sacramento River winter-run chinook (reclassified as endangered)); 59 Fed. Reg. 42,529 (1994) (codified at 50 C.F.R. § 222.23(a) (1998)) (Snake River spring/summer chinook and Snake River fall chinook (emergency interim rule)); 60 Fed. Reg. 19,342 (1995) (codified at 50 C.F.R. § 227.4(f)–(g) (1998)) (Snake River spring/summer chinook and Snake River fall chinook (final listing)); 61 Fed. Reg. 56,138 (1996) (codified at 50 C.F.R. § 227.4(h), 227.21(a)–(b) (1998)) (central California coast coho (threatened)); 62 Fed. Reg. 1296 (1997) (codified at 50 C.F.R. § 227.4(h) (1998)) (central California coast coho (threatened) (correction)); 62 Fed. Reg. 24,588 (1997) (codified at 50 C.F.R. § 227.4(i) (1998)) (southern Oregon/northern California coast coho (threatened)); 62 Fed. Reg. 43,937 (1997) (codified at 50 C.F.R. §§ 222.23(a), 227.4(j)–(l) (1998)) (West Coast steelhead (threatened and endangered)); 63 Fed. Reg. 13,347 (1998) (codified at 50 C.F.R. § 227.4(m)–(n) (1998)) (steelhead (threatened)); 63 Fed. Reg. 42,587 (1998) (codified at 50 C.F.R. § 227.4(o) (1998)) (Oregon coast coho (threatened)); 64 Fed. Reg. 14,308 (1999) (to be codified at 50 C.F.R. §§ 223.102(a)(16)–(18), 224.101(a)) (Washington and Oregon chinook (threatened and endangered)); 64 Fed. Reg. 14,508 (1999) (to be codified at 50 C.F.R. § 223.102(a)(12)–(13)) (chum); 64 Fed. Reg. 14,517 (1999) (to be

these listings have given NMFS, an agency with little regulatory experience in freshwater areas,¹² effective regulatory control over a host of hydroelectric, hatchery, harvest, and habitat-damaging activities. This dramatic expansion in regulatory control has transformed NMFS into an agency with major land and water management decisionmaking authority throughout the coastal West.¹³ In addition, this expansion has made clear that notions that the ESA is all substance and no procedure, and all science and no economics, are myths.¹⁴ In truth, the salmon experience with the ESA reveals the statute to be procedurally complex and quite economically sensitive in its effects on land and water use decisionmaking.

This Article explores the ESA in the context of salmon restoration, focusing particularly on Columbia Basin salmon because most of the ESA's salmon experience has been in the Columbia Basin and because the stakes are extremely high. The Article spotlights the federal consultation process required by section 7 of the ESA because that process has elevated NMFS to a prominent role in salmon restoration efforts. It is true that the statute's proscription against "takes" of listed salmon¹⁵ will also have major effects on land and water use decisionmaking, but most of those effects have yet to be felt.¹⁶

codified at 50 C.F.R. § 223.102(a)(14)–(15)) (steelhead (threatened)); 64 Fed. Reg. 14,528 (1999) (to be codified at 50 C.F.R. § 223.102(a)(19)) (sockeye (threatened)).

12. NMFS does have regulatory authority under the Magnuson Fishery Conservation and Management Act of 1976, 16 U.S.C. §§ 1801–1883 (1994), and the Marine Mammal Protection Act, 16 U.S.C. §§ 1361–1407 (1994). NMFS shares authority under the ESA with the U.S. Fish and Wildlife Service; under an intergovernmental agreement, NMFS has ESA authority concerning anadromous fish (fish that spawn in freshwater but spend a portion of their adult life in salt water) like salmon. *See* 51 Fed. Reg. 19,926 (1986).

13. *See infra* notes 491–94 and accompanying text.

14. *See infra* notes 495–99 (discussing vague substance of biological opinions (BiOps)); *infra* notes 511–14 (discussing "streamlining" process of BiOps); *infra* notes 532–35 (discussing economic sensitivity in BiOps).

15. The "take" prohibition, 16 U.S.C. § 1538 (1994), gives NMFS substantial authority over private activities. *See infra* notes 16, 213, and accompanying text. On the effect of the "take" prohibition, see generally Daniel J. Rohlf, *The Endangered Species Act: A Guide to Its Protections and Implementation* 59–77 (1989); Blumm & Simrin, *Unraveling Parity*, *supra* note 4, at 721–22.

16. BiOps may include "incidental take statements," indirectly authorizing nonfederal "takes" of listed species that occur in connection with a federal agency action or a federal license or permit. *See* 16 U.S.C. § 1536(b)(4)(B) (1994); *see also* Ramsey v. Kantor, 96 F.3d 434 (9th Cir. 1996); James C. Kilbourne, *The Endangered Species Act Under the Microscope: A Closeup Look from a Litigator's Perspective*, 21 *Env'tl. L.* 499, 553–56 (1991).

Nonfederal "incidental takes" may also be authorized through "incidental take permits" under section 10 of the ESA. *See* 16 U.S.C. § 1539(a)(2) (1994). Although these permits require preparation of a "habitat conservation plan" (HCP), there are advantages to authorizing "takes" in this manner. Under

Part II of the Article explains the decisions to list the Columbia River Basin salmon runs for ESA protection, including NMFS's controversial concept of "evolutionarily significant unit," as well as its decisions, subsequently overturned in federal courts, not to list two salmonid species. Part III examines a number of NMFS's biological opinions, the chief means by which NMFS exerts its ESA land and water decisionmaking authority over federal activities after listing. The Article then explores, in turn, the effects of those opinions on Columbia Basin hydroelectric operations, hatchery practices, harvest regulations, and habitat management. Part III also shows that NMFS, now the central player in salmon restoration efforts, has employed its authority in a manner designed to minimize the ESA's effects on ongoing activities that damage listed salmon. Part IV explains the lessons learned from the ESA's effects on salmon restoration efforts, including effects on the salmon, NMFS, and the implementation of the statute. Part V concludes that the marriage between the ESA and salmon restoration efforts has forever changed both interpretation of the statute and management of the species, but notes that the ESA has yet to produce any demonstrable improvement of the salmon runs. Prospects for the future, especially with respect to the most imperiled of the listed salmon species, the Snake River salmon, are not especially promising.

the "no surprises" policy, the nonfederal entity may be assured that it will not be required to undertake or to pay for any measures not contained in the HCP for the life of the HCP, which can be 50 years or longer. *See* 50 C.F.R. § 17.32(b)(5) (1998). Moreover, because the nonfederal entity prepares the HCP, it may be able to preserve more flexibility in designing and implementing conservation measures than in the case of federally promulgated BiOps, particularly because the ESA requires HCPs only to "minimize and mitigate" takings of listed species "to the maximum extent practicable." 16 U.S.C. § 1539(a)(2)(B)(ii).

Dam operators on the mid-Columbia have apparently decided that the benefits of these provisions outweigh the costs of HCP preparation and are proceeding to apply for a section 10 permit. *See infra* note 484; Margaret Hollenbach, *Mid-Columbia Salmon Plans Celebrated*, 5 Columbia Basin Bull. 2 (July 9, 1998) <http://www.nwppc.org/bulletin/bull_05.htm> (discussing near-completion of 50-year-long HCP on operation of three mid-Columbia dams). In the case of threatened species, which include several listed Columbia Basin salmon runs, the "take" prohibition does not apply unless incorporated into a conservation regulation authorized by section 4(d) of the ESA. *See* 16 U.S.C. § 1533(d) (1994). In such situations, HCPs are unnecessary because there is no statutory prohibition on "taking" threatened species. It also seems likely that section 4(d) conservation regulations will authorize "takes" that are consistent with state conservation plans, like the Oregon coho plan, which will effectively obviate the need for private entities to produce HCPs. *See infra* notes 193–212 and accompanying text.

II. THE LISTINGS

The salmon runs of the Columbia River Basin were once so abundant that they were “nothing short of fabulous.”¹⁷ For centuries before European settlement, Native American civilizations thrived in the basin, relying on salmon as the mainstay of their diet.¹⁸ The settlement of the region by white Europeans brought increasing pressures on the salmon resource. The advent of cannery technology spurred an explosion in the commercial fishing industry in the late 1800s.¹⁹ Transcontinental railroads with refrigerated cars brought fresh salmon to distant markets, and gasoline-powered ocean trollers advanced harvest technology.²⁰ By the turn of the century the basin’s salmon runs were greatly diminished, and the commercial fishing industry had already begun to falter.²¹

The Columbia River still had a major role to play in transforming the region’s economy, however, and this role severely affected its already-diminished salmon runs. The basin’s immense river flows were ripe for hydroelectric development, which would change the region’s resource-extractive economy into a more diverse economy with an industrial base.²² With Congress’s approval to begin building a massive hydroelectric infrastructure, the U.S. Army Corps of Engineers set out to tame the river.²³ The damming of the Columbia Basin forever blocked salmon from well over a thousand river miles of their historic habitat.²⁴ Where they were not completely blocked, salmon were forced to traverse manmade passageways and slack-water reservoirs. Eventually, the pressures became too much: too little habitat remained for some species to survive.²⁵ Many runs that did survive were critically imperiled and in need of immediate attention.²⁶

17. Charles F. Wilkinson, *Crossing the Next Meridian: Land, Water and the Future of the West* 184 (1992) (describing early impressions of white settlers that rivers ran so thick with fish “that a person could cross a stream by walking across their backs”).

18. See Blumm & Swift, *Piscary Profit*, *supra* note 2, at 433–34.

19. See *Northwest Salmon Crisis*, *supra* note 3, at 9–10; Cohen, *supra* note 2, at 40–41.

20. See *Northwest Salmon Crisis*, *supra* note 3, at 9–11.

21. See *id.* at 12.

22. See *id.* at 12–15.

23. The Corps’s first hydroelectric project on the Columbia River was the Bonneville Dam, begun in 1933 after the Corps recommended constructing 10 major works in the basin. See *id.* at 95–98.

24. Construction of Grand Coulee Dam in Washington State alone blocked around 1100 miles of spawning habitat. See *id.* at 13.

25. Habitat destruction by a variety of means is a factor in the decline of all listed Columbia and Snake River salmon. See *infra* notes 51–212 (discussing reasons for the listings).

26. See Nehlsen et al., *supra* note 6, at 4, 8–11.

As early as 1978, the NMFS and the U.S. Fish and Wildlife Service (FWS) began a comprehensive status review of upriver salmon populations to determine whether to list them under the ESA.²⁷ Two years later the fisheries agencies postponed the status review in the wake of Congress's passage of the Pacific Northwest Electric Power and Conservation Planning Act,²⁸ a bold attempt to mitigate damage to fish and wildlife "to the extent affected by the development and operation" of the hydropower system.²⁹ Unfortunately, that Act's attempt to elevate fish and wildlife to "co-equal partners" with hydropower³⁰ did not result in restored salmon runs. In 1990, the NMFS confirmed that salmon were in desperate trouble when it listed the first Columbia Basin salmon as endangered under the ESA.³¹ Since then many other species have been listed; more are likely to follow.

Before a species falls under the protective umbrella of the ESA, it must be listed as either endangered or threatened. The ESA defines as "endangered" any species "in danger of extinction throughout all or a significant portion of its range;"³² "threatened" species are those "likely to become . . . endangered."³³ Using only the "best scientific and commercial data available,"³⁴ the agency considers five factors in determining whether a species warrants listing.³⁵ These factors are (1) habitat loss or modification, (2) overharvesting, (3) disease or predation, (4) inadequate regulatory protection, and (5) other natural or manmade factors.³⁶

In the case of Pacific salmon, the listing process usually begins with a citizen petition, triggering a statutory duty to take action.³⁷ Within ninety days of the petition, the agency must, "[t]o the maximum extent practicable," make a determination "as to whether the petition presents substantial scientific or commercial information indicating that [a listing is]

27. See 43 Fed. Reg. 45,628 (1978); F. Lorraine Bodi, *Protecting Columbia River Salmon Under the Endangered Species Act*, 10 *Envtl. L.* 349, 349–50 (1980).

28. 16 U.S.C. § 839b (1994).

29. 16 U.S.C. § 839b(h)(10)(A); see also Michael C. Blumm, *The Amphibious Salmon: The Evolution of Ecosystem Management in the Columbia Basin*, 24 *Ecology L.Q.* 653, 660 (1997) [hereinafter Blumm, *Amphibious Salmon*].

30. Blumm, *Amphibious Salmon*, *supra* note 29, at 660–61.

31. See *infra* notes 56–63, 72–82, and accompanying text.

32. 16 U.S.C. § 1532(6) (1994).

33. 16 U.S.C. § 1532(20) (1994).

34. 16 U.S.C. § 1533(b) (1994).

35. See 16 U.S.C. § 1533(a) (1994).

36. See 16 U.S.C. § 1533(a).

37. See 16 U.S.C. § 1533(b)(3)(A).

warranted.”³⁸ If so, the agency immediately begins a status review of the species and, within twelve months of receiving the petition, determines that the listing is (1) not warranted, (2) warranted, or (3) warranted but precluded by a listing backlog.³⁹ A “warranted but precluded” finding is treated as a new petition, so that the listing agency must revisit the issue every twelve months and make a new determination.⁴⁰

Given that the ESA is now over a quarter-century old, it is surprising that the decision whether to list a species often turns on the threshold question of what constitutes a “species.” The ESA defines a species as including “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.”⁴¹ By including subcategories of a species in the definition, Congress established a policy of protecting local populations important to a species’ overall survival.⁴² How NMFS implements that policy, however, is controversial.

In the context of Pacific salmon, NMFS employs the concept of an “evolutionarily significant unit” (ESU) to determine if there is a “distinct population segment” eligible for listing.⁴³ To be considered an ESU, a population must (1) be “substantially reproductively isolated from other conspecific population units,” and (2) “represent an important component in the evolutionary legacy of the species.”⁴⁴ The major criticism of NMFS’s ESU concept is that, both as a matter of biology and policy, it fails to respond to Congress’s intent to protect both species and the ecosystems on which they depend.⁴⁵ For example, the ESU policy constrains NMFS’s ability to protect genetically connected populations that “can contribute to the genetic diversity and hence persistence of an entire species.”⁴⁶

38. 16 U.S.C. § 1533(b)(3)(A).

39. *See* 16 U.S.C. § 1533(b)(3)(B).

40. *See* 16 U.S.C. § 1533(b)(3)(C)(i) (1994).

41. *See* 16 U.S.C. § 1532(16) (1994).

42. *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 *Env’tl. L.* 617, 632 (1994).

43. 56 *Fed. Reg.* 58,612, 58,612 (1991).

44. *Id.* at 58,621.

45. *See* Rohlf, *supra* note 42, at 640–42. By focusing almost exclusively on the ESA’s policy to maintain genetic diversity within populations, NMFS’s ESU policy ignores other equally important policies like protecting healthy ecosystems, maintaining management flexibility where science is uncertain, and conserving local populations threatened with extirpation even where the species is abundant in other areas. *See id.* at 636–51.

46. *Id.* at 638.

Moreover, by requiring reproductive isolation as a factor in the definition, the policy “ignores [Congress’s] clear intent that NMFS and FWS should have authority to protect the U.S. population of a species even if that species was abundant elsewhere in the world.”⁴⁷ Thus, a species threatened with extinction in the lower forty-eight states, but reproductively connected to stable populations in Canada, would not qualify as an ESU. Nor does the policy account for the ESA’s ecosystem protections, because it focuses on populations in isolation from their surrounding community.⁴⁸ As discussed below, many salmonid ESUs now enjoy the ESA’s protections,⁴⁹ but NMFS has also used the ESU concept to deny other salmon runs protection under the Act.⁵⁰

A. Columbia Basin Salmon

1. Snake River Sockeye

A century of declining salmon runs in the Columbia Basin led to Snake River sockeye being the first Columbia River Basin salmon species listed for protection under the ESA.⁵¹ Historically, sockeye spawned in numerous

47. *Id.* at 642.

48. Professor Rohlf provided the following hypothetical to illustrate the point:

For instance, both sockeye and kokanee salmon inhabit Redfish Lake in Idaho. The former variety migrates downriver as juveniles 900 miles to the ocean, where these fish spend their adult lives before making the return journey to spawn; kokanee salmon, on the other hand, remain in the lake or its inlet for their entire lives. NMFS listed sockeye as endangered only after determining that these fish were probably reproductively isolated and genetically different from kokanee. Had NMFS not found that sockeye met both of these criteria, the agency would have lumped them into an ESU with kokanee, and would not have listed the ESU had it found the kokanee population secure. In this case, sockeye could even become extinct without triggering ESA concerns since the ESA would not prohibit dam construction or other activities downstream from the lake so long as the lake-dwelling portion of the ESU remained healthy.

Id. at 641–42 (citations omitted).

49. See *infra* notes 51–212 and accompanying text.

50. An example of NMFS deciding not to list a salmonid species based on its ESU concept is the Illinois River winter steelhead. Lacking conclusive scientific data distinguishing the population genetically from other steelhead, and declining to consider environmental threats specific to the Illinois River population, NMFS denied a listing. See 58 Fed. Reg. 29,390, 29,391 (1993); Rohlf, *supra* note 42, at 648 (critiquing NMFS’s application of its ESU concept). Another example is the Columbia River coho. See 56 Fed. Reg. 29,553 (1991). Recently, NMFS and the Fish and Wildlife Service have suggested that the Umpqua River cutthroat trout may be removed from the ESA list by combining the Umpqua ESU with an ESU comprised of cutthroat trout from rivers in southwestern Washington. See *infra* note 432 and accompanying text.

51. See 56 Fed. Reg. 58,612, 58,619 (1991).

Idaho lakes in the Salmon and Wallowa sub-basins, within the Snake River Basin.⁵² In the late 1800s, Snake Basin sockeye fed a strong commercial fishery around many of the species' spawning lakes, but those fisheries eventually disappeared after agricultural diversions of water and dam construction blocked their upstream migration.⁵³ Escapements⁵⁴ of Snake Basin sockeye in the latter half of this century have fluctuated, but they eventually plummeted to the point where zero returning sockeye were counted at Lower Granite Dam in 1990.⁵⁵

In 1990, at the nadir of the species' decline, the Shoshone-Bannock Tribe petitioned NMFS to list Snake River sockeye as endangered under the ESA.⁵⁶ Almost immediately, NMFS initiated a status review of sockeye that led to the agency's decision to propose listing the species as endangered.⁵⁷ Some comments on the proposal challenged the status of Snake River sockeye as a species under the ESA,⁵⁸ while others identified a host of potential anthropogenic causes of the species' endangerment.⁵⁹ NMFS responded that Snake River sockeye are a separate ESU and are therefore appropriate for ESA protection, and identified what it considered to be the factors most affecting the species. While commercial overharvesting likely precipitated the initial dramatic declines, other factors now dominate,

52. Sockeye are unique among the Columbia Basin salmon in that they spawn in lakes instead of stream beds and make the longest journey back to their natal spawning habitat of any North American salmonid. See Keith C. Petersen, *River of Life, Channel of Death: Fish and Dams on the Lower Snake* 193 (1995). Sockeye once spawned in Alturas, Pettit, Redfish, Yellowbelly, and Stanley Lakes in the Stanley Basin of the Salmon River, in Little Redfish Lake on Redfish Creek, and in Big Payette Lake and Wallowa Lake on the Payette and Wallowa Rivers, respectively. See 56 Fed. Reg. at 58,622.

53. See 56 Fed. Reg. at 58,622.

54. Escapement generally means fish that "escape" from harvests. In the Columbia Basin, those fish that escape to spawn also survive hazardous downstream and upstream river migrations. See Michael C. Blumm, *Hydropower vs. Salmon: The Struggle of the Pacific Northwest's Anadromous Fish Resources for a Peaceful Coexistence with the Federal Columbia River Power System*, 11 *Env'tl. L.* 211, 216-21 (1981) [hereinafter Blumm, *Hydropower vs. Salmon*].

55. See 56 Fed. Reg. at 58,622.

56. See *id.* at 58,619.

57. NMFS moved quickly to list Snake River sockeye. The status review began one week after the petition was filed. See *id.* Two months later, NMFS published notice that there was substantial evidence to warrant a listing. See 55 Fed. Reg. 22,942 (1990). A NMFS technical report on the status of sockeye and the proposed rule followed soon after. See 56 Fed. Reg. 14,055 (1991).

58. The ESA defines a species as including "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." 16 U.S.C. § 1532(16) (1994). NMFS considers a salmon population as a "distinct population segment" capable of listing if the population represents an ESU of the species. See 56 Fed. Reg. 58,612 (1991). See Rohlf, *supra* note 42, at 636-51, for detailed criticism of the ESU concept.

59. See 56 Fed. Reg. at 58,619-21.

including hydropower development on the Columbia and Snake Rivers;⁶⁰ water withdrawals for irrigation and storage;⁶¹ increased predation by northern squawfish, marine mammals, and birds; and natural drought cycles.⁶² NMFS listed the species in 1991, a year in which only four sockeye returned to Redfish Lake.⁶³

2. *Snake River Spring/Summer and Fall Chinook*

The plight of Snake River spring/summer and fall chinook has been on NMFS's agenda for nearly a decade. With the chinook's continued decline, and the consequent close scrutiny given federal actions affecting all Columbia River Basin salmonids, NMFS's role as a major regulatory player in the region will likely extend well into the next millennium.

Less than six months after listing Snake River sockeye, in response to another citizen petition, NMFS listed as threatened Snake River spring/summer chinook and fall chinook.⁶⁴ At one point, Snake River spring/summer chinook accounted for more than forty percent of all chinook returns in the Columbia Basin, producing more than 1.5 million fish per year in the late 1800s.⁶⁵ The runs declined to less than ten percent of their historic strength by the mid-1900s, however, and they continued to

60. *See id.* Hydroelectric dams adversely affect salmon in a variety of ways. Dams can simply block the fish from reaching their habitat, kill juveniles passing through the turbines, delay juvenile downstream migration and adult upstream migration, and increase the likelihood of predation. *See id.*; *see also* Blumm, *Hydropower vs. Salmon*, *supra* note 54, at 216–21. For a history of hydroelectric development of the Columbia Basin, see Michael C. Blumm, *The Northwest's Hydroelectric Heritage: Prologue to the Pacific Northwest Conservation and Electric Power Planning Act*, 58 Wash. L. Rev. 175 (1983).

61. *See* 56 Fed. Reg. at 58,622.

62. *See id.* at 58,623. Increased predation from squawfish and birds is a direct result of dams. Water impoundments behind the dams slow juvenile passage and create ideal forage habitat for squawfish. *See id.* Those salmon that survive the gauntlet of reservoirs face additional risks of predation after passing through the dams. Turbulence created by turbines, dam bypasses, and spillways disorient and confuse migrating fish, making them easy prey for aquatic and avian predators. *See id.* Finally, if a salmon migrant is able to navigate safely the Snake and Columbia Rivers, it can still fall prey to increasing numbers of marine mammals along the West Coast. *See id.* Nineteen-ninety was the fourth consecutive drought year in the Snake River Basin. *See id.*

63. *See id.* at 58,622.

64. *See* 57 Fed. Reg. 14,653 (1992). A coalition of environmental groups, led by Oregon Trout, filed a petition to list Snake River chinook in May 1991. *See id.* at 14,654.

65. *See id.* at 14,659.

fluctuate for another forty years. The species posted an all-time low in 1991, numbering less than one percent of their original 1.5 million.⁶⁶

Fall chinook have fared no better. In 1901, construction of Swan Falls Dam cut off returning adults from over one hundred miles of upstream habitat.⁶⁷ Despite this dramatic loss of habitat, the fall chinook population stabilized at around 70,000 returning adults until the 1950s, when it plummeted to less than half that number.⁶⁸ From the late 1950s through 1975, dam construction further reduced fall chinook habitat to “only a fraction of its former range.”⁶⁹ In 1990, NMFS estimated wild fall chinook escapement to Lower Granite Dam—the uppermost Snake River dam that salmon can surmount—at only seventy-eight fish.⁷⁰

In 1990, a coalition of environmental organizations petitioned NMFS to list separately spring chinook, summer chinook, and fall chinook.⁷¹ NMFS declined to list spring and summer chinook as separate ESUs, citing genetic similarities and difficulty in clearly demarcating life history distinctions between the two forms. Instead, NMFS listed the spring and summer runs as a single ESU.⁷² The factors NMFS discussed as leading to the listing mirrored those for sockeye,⁷³ including hydropower development, water

66. The return of hatchery fish, commingled with wild fish, complicates the process of estimating the size of wild salmon runs. For example, in 1991, 17,149 returning fish were counted at Ice Harbor Dam on the Snake River, but estimated wild salmon returns were less than half that number. *See id.*

67. *See id.* at 14,660.

68. *See id.*

69. *Id.* In just 25 years, nine dams were constructed along the Snake River, completely blocking or inundating with reservoirs the vast majority of the species' spawning habitat. *See id.*

70. *See id.*

71. *See id.* at 14,654.

72. *See id.* at 14,654–55, 14,658. NMFS's biologists concede that assessing evolutionary significance is inherently uncertain. The two means for making the determination—observation of physical, behavioral, and life history traits and direct DNA analysis—are limited by confounding environmental and technical factors that scientists are unable to control. *See* Robin S. Waples, *Definition of Species Under the Endangered Species Act: Applications to Pacific Salmon*, NOAA Technical Memorandum NMFS F/NWC-194 (1991); Rohlf, *supra* note 42, at 644–45. There are, however, distinct genetic and life history differences between spring/summer chinook and fall chinook sufficient to support listing them separately. *See* 57 Fed. Reg. at 14,658–59. Many comments to the proposed rule argued that both species should each be listed as endangered rather than threatened. For spring/summer chinook, NMFS dismissed the suggestion out-of-hand. For fall chinook, NMFS cited a one-year escapement increase from 1990 to 1991 and improved management of hatchery fish to support its decision to list the species as threatened rather than endangered. *See id.* Other comments highlighted the effects of dam operations on juvenile migration, harvest rates, hatchery operations, juvenile fish transportation, ineffective management by other state and federal agencies, and adverse effects from activities on lands adjacent to the rivers. *See id.* at 14,655–57.

73. *See supra* notes 51–63 and accompanying text.

storage, water diversions for irrigation, siltation, and water pollution.⁷⁴ As with sockeye, NMFS stated that overharvesting played a key role in initial declines, but hydropower development and its associated impacts formed the core of current threats to the species.⁷⁵

Alarmed by a punctuated decline in both spring/summer and fall chinook, NMFS promulgated an emergency interim rule listing both species as endangered in August 1994.⁷⁶ Small population sizes for both species presented an increased risk of extinction due to random demographic or genetic events.⁷⁷ NMFS noted that, contrary to its earlier expectations, operational changes in the lower Snake and Columbia River dams,⁷⁸ coupled with decreased harvest rates,⁷⁹ had not restored salmon populations.⁸⁰ The agency also noted an overall inadequacy of existing regulatory mechanisms to increase the species' chances for survival.⁸¹ Generally, however, all the factors leading to listing a species as threatened continued to be factors in the species' decline to endangered status. In addition, NMFS emphasized two other possible causes: (1) the El Niño weather phenomenon and its associated changes in primary and secondary ocean productivity could partially explain the decline of spring/summer chinook; and (2) hatchery operations posed an additional threat to fall chinook.⁸²

Citing the same reasons as in the emergency rule, NMFS proposed to list permanently both species as endangered in December 1994.⁸³ Three years

74. See 57 Fed. Reg. at 14,660.

75. See *id.*

76. See 59 Fed. Reg. 42,529 (1994) (codified at 50 C.F.R. § 222.23(a) (1998)). The 1994 pre-season estimate for spring/summer chinook was 49,000 returning adults. But by the end of the season, only 20,132 fish were counted at Bonneville Dam. Fall chinook also continued to decline since listing. The forecast for both spring/summer and fall chinook in 1995 was even more bleak. See *id.* at 42,530.

77. See *id.* at 42,530. For a discussion of how small population size increases the risk of extinction, see Michael E. Gilpin & Michael E. Soulé, *Minimum Viable Populations: Processes of Species Extinction*, in *Conservation Biology: The Science of Scarcity and Diversity* 25–33 (Michael E. Soulé ed., 1986).

78. NMFS expressed optimism that changes in dam operations would yield long-term benefits to the species. See 59 Fed. Reg. at 42,530. But see text accompanying *supra* note 5.

79. Harvest rates (commercial, recreational, and tribal combined) for Columbia and Snake River fall chinook decreased from 70% in 1990 to 50% in 1991 to 1993, with no effect on the species' decline. See 59 Fed. Reg. at 42,531.

80. See *id.* at 42,530–31.

81. See *id.* at 42,531.

82. See *id.*

83. See 59 Fed. Reg. 66,784 (1994).

later, however, the agency withdrew the proposal due to significant increased adult return counts and escapement estimates.⁸⁴ Three months after withdrawing its proposal, NMFS released a new, more comprehensive proposal for fifteen West Coast chinook ESUs within California, Oregon, Washington, and Idaho.⁸⁵ The ESUs within the Columbia River Basin included: (1) Lower Columbia River chinook; (2) Upper Columbia River spring-run chinook; (3) Upper Willamette River chinook; and (4) a redefined Snake River fall-run chinook ESU.⁸⁶ In March 1999, NMFS decided to list these species.⁸⁷

NMFS listed the Lower Columbia River chinook ESU as threatened.⁸⁸ Habitat degradation in this ESU is widespread, primarily as a result of dam construction dating back as far as the early 1900s.⁸⁹ A long history of hatchery fish releases also have had what NMFS termed a “pervasive influence.”⁹⁰ Since 1930, fishery managers have released over 200 million hatchery fish derived from stocks from outside the ESU, creating concern over loss of genetic diversity and decreasing numbers in the wild population. Indeed, with so many hatchery fish commingled with wild fish, NMFS was unable to determine the number of wild fish in this ESU,⁹¹ although recent data from the Oregon Department of Fish and Wildlife allowed NMFS to identify streams where wild runs continue to exist.⁹²

84. See 63 Fed. Reg. 1807, 1809–10 (1998). Escapement of naturally spawning spring/summer chinook rose from a low of 1116 in 1995 to an estimated 6500 in 1997, while fall chinook experienced a more modest increase from 350 escaping individuals in 1995 to an estimated 726 in 1997. NMFS cited improved management of the Snake and Columbia River dams for salmon migration, including increased water flows and physical modifications to mainstem dams, as one cause of the increased numbers. See *id.* at 1810. Other potential factors NMFS discussed were curtailed harvest rates, increased rainfall in the region, improved hatchery management, and strengthened regulatory mechanisms. See *id.* at 1811 tbl.1.

85. See 63 Fed. Reg. 11,482 (1998) (codified at 50 C.F.R. §§ 222.23(a), 226.28, 227.4(g), (p)–(q) (1998)).

86. See *id.* NMFS redefined the Snake River fall chinook ESU that expanded the ESA’s protections to a broader geographic range of the species. See *id.* at 11,497. The current Deschutes River population, as well as the now-extirpated populations from the John Day, Umatilla, and Walla Walla Rivers was included in the expanded ESU. Although the Snake River stocks were at one point the most productive in the ESU, recent adult returns to the Deschutes River have surpassed those in the Snake. See *id.* at 11,497–98.

87. See 64 Fed. Reg. 14,308 (1999) (to be codified at 50 C.F.R. §§ 223.102(a)(16)–(18), 224.101(a)).

88. See *id.* at 14,321.

89. See 63 Fed. Reg. at 11,495.

90. *Id.*

91. See *id.*

92. See 64 Fed. Reg. at 14,321.

NMFS listed the Upper Columbia River spring-run chinook ESU as endangered.⁹³ Escapement in 1994–95 was the lowest in sixty years; at least six stocks within the geographic range of this ESU are extinct.⁹⁴ Dams have probably played a larger role in contributing to the declines in this ESU than in any other. Construction of the Grand Coulee and Chief Joseph Dams forever blocked a “substantial portion” of salmon habitat.⁹⁵ To reach the remaining habitat, salmon must successfully navigate nine Columbia River mainstem dams.⁹⁶ According to NMFS, the combination of extensive habitat loss, degraded riparian, in-stream, and estuary habitat, lost migration corridors, and augmented flow patterns put this ESU in danger of extinction.⁹⁷ Artificial propagation through hatchery and trap-and-transport programs has also had a significant effect. Attempts to restock Columbia River tributaries by trapping adults at dams and transporting them to streams with depressed populations likely has led to the introduction of non-native fish, and the consequent dilution of the native genetic stock.⁹⁸ A recent study conducted by an interagency working group developing a habitat conservation plan on the Mid-Columbia River determined that there is a greater than fifty-percent chance the species will go extinct within fifty years under current conditions.⁹⁹

NMFS listed the Upper Willamette River chinook ESU as threatened.¹⁰⁰ Wild fish account for only one-third of escapement counts in this ESU; they are likely declining and unable to sustain themselves.¹⁰¹ Hatchery influences are less pervasive here than in the lower Columbia, but nevertheless may have caused homogenization of the populations.¹⁰² Another genetic detriment is the possible hybridization between wild spring chinook and hatchery fall chinook. As with other Columbia River Basin chinook ESUs, dam construction and agricultural uses are responsible for blocking and

93. *See id.* at 14,324.

94. *See* 63 Fed. Reg. at 11,497.

95. *Id.*

96. *See id.* Construction of Grand Coulee Dam in 1939 forever blocked all anadromous fish from over 1100 miles of upstream habitat. *See infra* note 128 and accompanying text.

97. *See* 63 Fed. Reg. at 11,497.

98. *See id.*

99. *See* 64 Fed. Reg. 14,308, 14,323 (1999).

100. *See id.*

101. *See* 63 Fed. Reg. at 11,495. Wild fish escapement is below 5000 fish and declining. *See id.* at 11,496.

102. *See id.* at 11,495–96.

degrading habitat.¹⁰³ Unlike some of the more rural ESUs, however, urbanization played a significant role here.¹⁰⁴ Moreover, commercial and recreational fishery harvests are too high for an already-declining wild population.¹⁰⁵

All chinook ESUs suffer in various ways from inadequate regulatory mechanisms. The Northwest Forest Plan, the centerpiece of which is an aquatic conservation strategy, is limited because it applies only to federal lands, which are only sporadically distributed throughout the ESUs' range.¹⁰⁶ PACFISH—an agreement between the U.S. Forest Service and Bureau of Land Management providing interim anadromous fish management strategies within the Columbia Basin—is similarly limited.¹⁰⁷ Federal lands covered by the agreement are inadequate to protect salmon.¹⁰⁸ State regulatory protections similarly are inadequate. For example, NMFS considers both the Oregon and Washington forest practices regulations insufficient salmon protectors because, among other things, they do not adequately provide for the introduction of woody debris into streams to create salmon habitat.¹⁰⁹

Statutory mechanisms have failed to improve the status of chinook ESUs. The protections offered salmonids under the Clean Water Act (CWA) are inadequate as currently implemented.¹¹⁰ For example, the guidelines governing authorized discharges of dredged or fill material under section 404 of the CWA lack a methodology for assessing cumulative

103. See 64 Fed. Reg. at 14,322.

104. See 63 Fed. Reg. at 11,496.

105. See *id.*

106. See Bureau of Land Management, U.S. Forest Serv., *Final Supplemental Environmental Impact Statement on Management of Habitat for Late Successional and Old Growth Forest Related Species Within the Range of the Northern Spotted Owl* (1994) [hereinafter *Northwest Forest Plan*].

107. See *id.*; Oliver A. Houck, *Are Humans Part of Ecosystems?*, 28 *Envtl. L.* 1, 10–11 (1998) (discussing some key features of PACFISH).

108. See 63 Fed. Reg. at 11,499. According to NMFS, other programs within the chinook ESUs are the Lower Columbia River National Estuary Program, the Oregon Plan for Salmon and Watersheds, the Washington Wild Stock Restoration Initiative, and the Washington Wild Salmonid Policy. See 64 Fed. Reg. at 14,316.

109. See 63 Fed. Reg. at 11,500 (noting that introduction of organic material is important for creating fish). NMFS did recognize, however, a recent effort by Oregon's Governor Kitzhaber to advance long-term protective measures for salmonids in an Executive Order implementing aspects of the Oregon Plan for Salmon and Watersheds. Moreover, NMFS noted efforts to improve water quality in the Willamette River by the Cities of Portland, Oregon and Vancouver, Washington, as well as the Oregon regional government, Metro. See 64 Fed. Reg. at 14,317.

110. See Federal Water Pollution Control Act (CWA), 33 U.S.C. §§ 1251–1387 (1994); see also 63 Fed. Reg. at 11,500.

impacts of such discharges, which can destroy salmon spawning and rearing habitat.¹¹¹ Failure to meet the CWA's water quality standards can also leave salmon habitat polluted, especially from warm temperatures.¹¹²

3. *West Coast Steelhead*

In August 1997, NMFS listed five of fifteen steelhead ESUs: three as threatened and two as endangered.¹¹³ In March 1998, NMFS listed two steelhead ESUs as threatened: one in California and one in the Columbia Basin.¹¹⁴ A year later NMFS listed two more ESUs as threatened.¹¹⁵ Steelhead have the most complex salmonid life histories, with both anadromous forms (steelhead) and freshwater forms (rainbow or redband trout).¹¹⁶ West Coast steelhead are further divided into coastal and inland subspecies, roughly separated by the crest of the Cascades.¹¹⁷ Historically, the species ranged from the Asian Kamchatka Peninsula to the northern Baja Peninsula, with forms appearing in nearly every coastal stream in between. The current range along the U.S. West Coast has diminished, however, so that the known southernmost extent of the range is Malibu Creek in Southern California.¹¹⁸ Throughout the remaining range, at least twenty-three natural stocks are extinct, and another forty-three face some risk of extinction.¹¹⁹ For the purpose of listing the species under the ESA, NMFS identified fifteen ESUs within the remaining West Coast populations.

111. See 63 Fed. Reg. at 11,500.

112. The effects of nonpoint source pollution on fishery resources are frequently ignored. See *id.* One way to address this problem is by setting Total Maximum Daily Loads (TMDLs) for waters not meeting state water quality standards. See 33 U.S.C. § 1313(d) (authorizing TMDL program). After determining the total amount of pollution a water body can absorb and meet state water quality standards, the state allocates that amount of pollution among permittees. For an extensive exposition on the TMDL process, see Oliver A. Houck, *TMDLs: The Resurrection of Water Quality Standards-Based Regulation Under the Clean Water Act*, 27 *Envtl. L. Rep. (Envtl. L. Inst.)* 10,329 (July 1997); Oliver A. Houck, *TMDLs, Are We There Yet? The Long Road Toward Water Quality-Based Regulation Under the Clean Water Act*, 27 *Envtl. L. Rep. (Envtl. L. Inst.)* 10,391 (August 1997); Oliver A. Houck, *TMDLs III: A New Framework for the Clean Water Act's Ambient Standards Program*, 28 *Envtl. L. Rep. (Envtl. L. Inst.)* 10,415 (Aug. 1998).

113. See 62 Fed. Reg. 43,937 (1997) (codified at 50 C.F.R. §§ 222.23(a), 227.4(j)-(l) (1998)).

114. See 63 Fed. Reg. 13,347 (1998) (codified at 50 C.F.R. § 227.4(m) (1998)).

115. See 64 Fed. Reg. 14,517 (1999) (to be codified at 50 C.F.R. § 223.102(a)(14)-(15)).

116. See 62 Fed. Reg. at 43,938.

117. See *id.*

118. See *id.*

119. See *id.*

Responding to petitions to list steelhead throughout its range,¹²⁰ NMFS initially proposed to list ten of the fifteen ESUs: five as threatened and five as endangered.¹²¹ But in the 1997 listings NMFS decided to list only two ESUs as endangered and three as threatened.¹²² Those listings were followed by four more listings for a total of nine listed ESUs as of March 1999.¹²³ Within the Columbia River Basin, NMFS listed the Upper Columbia River ESU as endangered and the Snake River Basin ESU as threatened;¹²⁴ the Lower Columbia ESU as threatened;¹²⁵ and the Middle Columbia and Upper Willamette River ESUs as threatened.¹²⁶

The Upper Columbia River steelhead ESU extends from the Yakima River in Washington to the United States-Canada border.¹²⁷ However, most of the habitat in the ESU has been unavailable because construction of Grand Coulee Dam blocked over 1100 miles of upstream salmon habitat in 1939.¹²⁸ Steelhead in this ESU, already depressed from overfishing,¹²⁹ were confined to substantially less of their native habitat by Grand Coulee Dam, making valuable spawning grounds unavailable to migrating salmon. In an attempt to alleviate the adverse effects of this habitat loss, from 1939 to 1943 the fishery agencies trapped all anadromous fish at Rock Island Dam, below Grand Coulee, then transplanted them to hatcheries or released them in tributaries between the two dams.¹³⁰ In the process, they redistributed steelhead without regard to their stream of origin, which indiscriminately mixed genetic stocks in the hatcheries.¹³¹ Since construction of Grand Coulee, naturally spawning steelhead have continued to decline, both in absolute numbers and in relation to the number of hatchery fish in the ESU.¹³² Even more telling is that the remaining wild fish are not producing

120. See 61 Fed. Reg. 41,541, 41,541-42 (summarizing various petitions to list steelhead).

121. See 61 Fed. Reg. 41,541 (1996) (codified at 50 C.F.R. §§ 222.23(a), 227.4(n)-(q), 227.21(a)-(b) (1998)).

122. See 62 Fed. Reg. at 43,937.

123. See 63 Fed. Reg. 13,347 (1998) (codified at 50 C.F.R. § 227.4(m)-(n) (1998)); 64 Fed. Reg. 14,517 (1999) (to be codified at 50 C.F.R. § 223.102(a)(14)-(15)).

124. See 62 Fed. Reg. at 43,937.

125. See 63 Fed. Reg. at 13,347.

126. See 64 Fed. Reg. at 14,517.

127. See 62 Fed. Reg. at 43,945.

128. See *id.* at 43,945-46.

129. See *id.* at 43,949.

130. See *id.* at 43,946.

131. See *id.* at 43,946, 43,949-50.

132. See *id.* at 43,949 (noting that hatchery fish account for 65-80% of steelhead in these rivers).

enough surviving offspring to replace themselves. NMFS estimated that the adult replacement ratio was only 0.3:1 in the Wenatchee and Entiat Rivers,¹³³ meaning that only thirty percent of the adult wild population are replaced each year, a sure recipe for extinction.

The Snake River Basin steelhead ESU includes southeast Washington, northeast Oregon, and Idaho.¹³⁴ Based on life history differences in run timing, size, and habitat use, Snake River steelhead are divided into A-run and B-run components. This is a management distinction only, however, and does not require separate treatment under the ESA. There are no counts of naturally spawning steelhead prior to construction of Ice Harbor Dam in 1962. Total counts at Lower Granite Dam from 1990–1994 averaged 71,000 adult salmon, of which approximately 9400 were wild fish (7000 A-run and 2400 B-run).¹³⁵ According to NMFS, these runs “have suffered severe declines,” especially the B-run steelhead.¹³⁶ Hatchery fish account for over eighty percent of the fish counted at Lower Granite Dam, and in some reaches of the basin there is a pronounced risk of hatchery fish mixing with wild stocks. Increasingly, small population sizes leave this ESU susceptible to random genetic and demographic events that may lead to extinction.¹³⁷

Not surprisingly, NMFS listed hydropower development as a key factor leading to the decline of West Coast steelhead.¹³⁸ Other factors included increased in-stream and oceanic predation, increased susceptibility to disease, climatic and drought-related influences, and the addition of hatchery fish.¹³⁹ In Washington and Oregon, land use practices on federal and private lands dramatically decreased the number of large deep pools important to the species, through siltation and removal of pool-forming objects like boulders and downed trees.¹⁴⁰ In this area, listed steelhead are also subject to a large incidental harvest, possibly exceeding thirty percent, because the timing of these runs coincides with runs of other nonlisted, commercially harvested, hatchery-produced steelhead, chinook, and coho.¹⁴¹

133. *See id.*

134. *See id.* at 43,946.

135. *See id.* at 43,950.

136. *Id.*

137. *See id.*

138. *See id.* at 43,942.

139. *See id.*

140. *See id.*

141. *See id.*

Salmon and the Endangered Species Act

NMFS recognized the inadequacy of existing regulatory mechanisms to protect steelhead. First, as with chinook, NMFS concluded that both federal and state forest practices are inadequate to protect steelhead.¹⁴² For example, the Northwest Forest Plan is of limited utility in protecting steelhead because much of the species' range is composed of nonfederal lands. Where the plan does overlap with steelhead habitat, most notably in the Columbia River Basin, the distribution of federal lands does not always correspond with watersheds and river basins in need of protection.¹⁴³ PACFISH—an interim agreement between the Forest Service and Bureau of Land Management creating anadromous fish management strategies—is similarly limited to federal lands, and the federal agencies charged with its operation have not consistently implemented its watershed and riparian habitat measures.¹⁴⁴ Nor do state forest practices regulations provide sufficient protections because, as in the case of Washington's rules, they "do not provide properly functioning riparian and instream habitats."¹⁴⁵

Second, as with chinook, NMFS claimed that protections for salmon afforded by the CWA, and its implementation by the Corps and states, are currently inadequate. According to NMFS, the Corps has failed to adequately consider cumulative and additive impacts from dredge and fill operations, and EPA and the state were slow to implement the CWA's water quality programs.¹⁴⁶ Finally, state hatchery and harvest programs have had significant adverse effects on wild steelhead populations in the Columbia and Snake River Basins.¹⁴⁷ Although Oregon, Washington, and Idaho are implementing new regulatory policies to protect wild steelhead from the detrimental effects of hatcheries and harvest, NMFS concluded that additional measures were required to prevent extinction.¹⁴⁸

142. *See id.* at 43,942–43.

143. The U.S. Forest Service manages only 15–25% of the land in each of the steelhead ESUs. *See id.*

144. *See id.* (describing inadequacies of plans in context of steelhead).

145. *Id.* at 43,943.

146. *See id.* (describing relevant CWA programs).

147. *See id.* at 43,944.

148. *See id.* An example is Oregon's Wild Fish Management Policy. *See Or. Admin. R. 635-007-0525 to -0535* (1998).

4. *Chum*

In March 1999, NMFS listed two ESUs of chum salmon as threatened, one of which inhabits the Columbia Basin.¹⁴⁹ Chum ranges more widely than any other Pacific salmon, historically reaching from Monterey Bay in central California to Korea and Japan, and north into the Russian and Canadian rivers that empty into the Arctic Ocean.¹⁵⁰ Today, the species' range has contracted so that in the United States it ranges only as far south as Tillamook Bay in Oregon.¹⁵¹ Chum also were once the most abundant salmonid known, likely accounting for about fifty percent of the total salmon biomass in the Pacific Ocean prior to 1940.¹⁵² An important feature of the species' life history is that it spends relatively little time in freshwater habitat compared to other salmon; adults spawn in coastal streams within 100 kilometers of the coasts and juveniles migrate to the ocean "almost immediately after emerging" from the spawning grounds.¹⁵³ This means the species is less susceptible to many of the deleterious effects of inland human activities that have caused widespread decline of other salmon species like steelhead, coho, chinook, and sockeye.¹⁵⁴

Columbia River chum currently amount to less than one percent of their historic abundance.¹⁵⁵ Prior to a dramatic crash of the ESU's population in the 1950s, chum were extensively harvested, accounting for as many as half a million fish caught in the Columbia River alone.¹⁵⁶ Since then there has been no commercial chum fishery, and the population has remained relatively stable, albeit severely depressed in numbers and genetic diversity.¹⁵⁷

Despite the species' coastal life history characteristics and relative independence of freshwater stream systems, NMFS considered habitat

149. The second listed ESU is the Hood Canal summer-run ESU, which occurs in Washington State outside the Columbia Basin. See 64 Fed. Reg. 14,508 (1999) (to be codified at 50 C.F.R. § 223.102(a)(12)–(13)). NMFS also recognizes two other chum ESUs that it did not list: Puget Sound/Strait of Georgia ESU and Pacific Coast ESU. See 63 Fed. Reg. 11,774 (1998) (codified at 50 C.F.R. §§ 226.26, 227.4(m)–(n) (1998)).

150. See 63 Fed. Reg. at 11,775.

151. See *id.*

152. See *id.*

153. *Id.*

154. See *id.*

155. See *id.* at 11,780.

156. See *id.*

157. See *id.*

destruction and modification of these systems to be a major cause of the species' decline; use of streams for log transportation and removing large woody debris from streams has a negative effect on the species.¹⁵⁸ Other habitat-related effects on chum come from water withdrawals and other water uses that decrease stream flows; logging and agriculture which increase stream sedimentation and loss of riparian habitat; mining; and urbanization.¹⁵⁹ Hydropower development played less of a role in this species' decline than that of other salmon, but nonetheless has blocked habitat areas and currently impedes upriver recovery efforts.¹⁶⁰

B. Bull Trout

The U.S. Fish and Wildlife Service has listed or proposed for listing all five of the bull trout distinct population segments.¹⁶¹ A number of factors affect the populations in various ways. Dams are particularly lethal for Columbia River bull trout because they destroy habitat, alter temperature and flow regimes, and most importantly, cut off the migratory form of bull trout from interbreeding with other populations and recolonizing extirpated populations.¹⁶² This, in turn, reduces genetic diversity within the species.¹⁶³ Forest management practices are another concern for bull trout. Logging and road building diminish the value of stream habitats for all bull trout life-history stages by modifying rates of sedimentation and woody debris recruitment, increasing water temperatures, and altering water flows.¹⁶⁴ Similarly, livestock grazing, agricultural practices, and mining activities all

158. *See id.* at 11,782.

159. *See id.* at 11,783.

160. *See id.*

161. NMFS originally proposed to list the Klamath River population as endangered but eventually decided to list Klamath bull trout as threatened, although it did list as endangered the Jarbidge population on an emergency interim basis in 1998, and later designated it as threatened in 1999. *See* 62 Fed. Reg. 32,268 (1997) (codified at 50 C.F.R. §§ 17.11(h), 17.44(v) (1998)); 63 Fed. Reg. 31,647 (1998) (codified at 50 C.F.R. §§ 17.11(h), 17.44(v) (1998)); 63 Fed. Reg. 31,693 (1998) (codified at 50 C.F.R. §§ 17.11(h), 17.44(v) (1998)); 63 Fed. Reg. 42,757 (1998) (codified at 50 C.F.R. § 17.11(h) (1998)); 64 Fed. Reg. 17,110 (1999) (to be codified at 50 C.F.R. §§ 17.11(h), 17.44(x)).

162. Bull trout exist as metapopulations, with the migratory form of bull the primary means by which genes flow between populations and new or extirpated areas are colonized. *See* 63 Fed. Reg. at 31,649, 31,657.

163. *See id.* at 31,657. Dams have so fragmented bull trout habitat that, within the Columbia River population segment, fully two-thirds of the subpopulations are directly or indirectly isolated from each other. *See id.*

164. *See id.* at 31,658.

adversely affect riparian areas and habitat and water quality.¹⁶⁵ Other factors injuring the species include residential construction, historic overharvesting, introduction of non-native species, extensive habitat fragmentation, and isolation. In addition, inadequate regulatory protections, particularly a lack of watershed management on federal lands managed by the Forest Service and Bureau of Land Management, negatively affect the species.¹⁶⁶

Although citizen petitions activated the listing process for sockeye, chinook, and steelhead, a citizen suit was necessary to bring about the listing of bull trout. In October 1992, environmental groups petitioned the U. S. Fish and Wildlife Service (FWS) to list bull trout as an endangered species.¹⁶⁷ In May 1993, over six months after the petition to list, FWS issued a finding indicating that there was substantial evidence that listing bull trout might be warranted.¹⁶⁸ When FWS failed to decide whether to list bull trout within the statutorily required twelve months, environmentalists sued to compel FWS to make a decision,¹⁶⁹ which it eventually did. However, FWS determined that although a listing was warranted, it was precluded because other species required attention from the agency's limited resources.¹⁷⁰ This determination was based on FWS's species-ranking system,¹⁷¹ in which only species ranked between one and six (out of a possible twelve) received listing attention. Because of the way FWS structures the ranking system, only species with a "high" magnitude of threat receive listing attention. Although FWS recognized an imminent threat to bull trout, it characterized the threat as only "moderate."¹⁷² The agency therefore awarded bull trout a rank of nine.¹⁷³

The 1994 "warranted but precluded" finding quickly came under attack from the original petitioners, who filed suit. FWS subsequently upgraded bull trout's rank from nine to three in a 1995 finding,¹⁷⁴ allowing the agency

165. *See id.* at 31,660–62.

166. *See id.* at 31,662–71.

167. *See* 58 Fed. Reg. 28,849 (1993).

168. *See id.*

169. *See* *Friends of the Wild Swan v. United States Fish & Wildlife Serv.*, 945 F. Supp. 1388, 1392 (D. Or. 1996) (citing *Alliance for the Wild Rockies v. Babbitt*, No. 94-0246-JLG (D.D.C. 1994)).

170. *See* 59 Fed. Reg. 30,254, 30,254 (1994).

171. The ranking system places species warranted for listing on a scale of 1 to 12, depending on (1) the magnitude of threat facing the species, (2) the immediacy of the threat, and (3) the species' taxonomic rank. *See* 48 Fed. Reg. 43,098, 43,102–03 (1983).

172. *Friends of the Wild Swan*, 945 F. Supp. at 1392.

173. *See* 59 Fed. Reg. at 30,254.

174. *See* 60 Fed. Reg. 30,825, 30,825 (1995).

to move to dismiss the petitioners' suit as moot because the 1995 finding supplanted the contested 1994 finding. The district court agreed that the 1995 finding mooted the suit, but allowed the plaintiffs to amend their complaint to challenge the new finding.¹⁷⁵ The plaintiffs declined the court's invitation, however, and instead appealed the mootness decision. The Ninth Circuit agreed with the plaintiffs, determining that the case fell within "the exception to the mootness doctrine for claims that are capable of repetition yet evading review," and consequently remanded the case to the district court.¹⁷⁶

On remand, the district court concluded that FWS's 1994 "warranted but precluded" finding was arbitrary and capricious.¹⁷⁷ The court ruled that FWS had failed to address the petitioners' requests for emergency listings of numerous bull trout populations.¹⁷⁸ Moreover, the court concluded that FWS acted arbitrarily and capriciously when it determined that the threat to bull trout was only "moderate."¹⁷⁹ Ultimately, the court ordered FWS to reconsider the 1994 "warranted but precluded" finding, based solely on the 1994 administrative record.¹⁸⁰

175. See *Friends of the Wild Swan*, 945 F. Supp. at 1393.

176. *Friends of the Wild Swan v. United States Fish & Wildlife Serv.*, No. 95-35916, 1996 WL 155142, at *6 (9th Cir. Apr. 2, 1996).

177. See *Friends of the Wild Swan*, 945 F. Supp. at 1393.

178. FWS argued that because it determined a listing was "warranted but precluded" in 1994, it had responded to petitioners' emergency listing requests. The court disagreed, noting that when making a "warranted but precluded" finding, the ESA requires FWS to use its emergency listing powers in a prophylactic manner. See *id.* at 1395 ("Congress's 1998 amendment [to the ESA] was 'unambiguous congressional direction to the Secretary that emergency listings of warranted but precluded species be issued prophylactically'" (quoting *City of Las Vegas v. Lujan*, 891 F.2d 927, 933 (D.C. Cir. 1989))). The court noted that FWS had mentioned the requests for emergency listing in its finding, but the agency did so in a cursory manner for only a portion of the populations requested. Because FWS could not explain why it denied the requests for emergency listing, the court concluded that the decision not to list bull trout on an emergency basis was arbitrary and capricious. See *id.* at 1396.

179. FWS's rationale for the "moderate" threat conclusion was grounded on the species' extensive range, the existence of some populations in protected areas, and future management changes expected to benefit the species. See *id.* at 1397. However, the record supported none of these claims. First, there was no indication in the record that the species' extensive range or its existence in protected areas lessened the threat of extinction. Indeed, FWS repeatedly referred to the genetic isolation of bull trout populations, due to loss of its migratory form, as creating a high risk of extinction. Second, the record reflected that, even in protected wilderness areas and national parks, bull trout face the risk of extinction from other introduced species. Third, as the court noted, reliance on predicted future management actions was contrary to FWS's duty to consider existing threats, see 16 U.S.C. § 1533(a) (1994), and at odds with its determination that listing was warranted because of inadequate existing regulatory mechanisms. See *Friends of the Wild Swan*, 945 F. Supp. at 1397-98.

180. See *Friends of the Wild Swan*, 945 F. Supp. at 1401-02.

The district court's decision did not end the bull trout dispute, however. FWS's revised finding recognized five distinct population segments¹⁸¹ of bull trout but proposed to list only two of them.¹⁸² This sent the parties back to court to challenge FWS's decision not to list bull trout throughout its range.¹⁸³ Again, the district court agreed with the plaintiffs, requiring FWS to reconsider its decision. The court ruled that FWS's decision to dissect the species into five distinct populations without considering listing the species throughout its range was arbitrary and capricious.¹⁸⁴ Consequently, the court remanded the decision again, instructing FWS to consider listing the species as a whole.¹⁸⁵ As a result, all five population segments are now listed or proposed for listing.¹⁸⁶

C. Oregon Coho

Like bull trout, Oregon coho were the subject of a citizen petition, this one filed in July 1993.¹⁸⁷ A subsequent petition, filed in October 1993, requested listings for all coho on the contiguous West Coast.¹⁸⁸ In July

181. FWS's "distinct population segment" policy differs from NMFS's ESU policy, although both are intended to implement the definition of "species" under the ESA. Most notably, FWS's policy accounts for a population's geographical distribution and political boundaries, in addition to genetic considerations. *See* 61 Fed. Reg. 4722, 4725 (1996).

182. The five distinct population segments were Coastal/Puget Sound, Klamath River, Columbia River, Jarbidge River, and Saskatchewan River. The Klamath River population was proposed as endangered, while the Columbia River population was proposed as threatened. *See* Friends of the Wild Swan v. United States Fish & Wildlife Serv., 12 F. Supp. 2d 1121, 1122–23 (D. Or. 1998).

183. *See id.* at 1123.

184. *See id.* at 1124. Key to the court's ruling was that FWS had "discussed the five ESA factors for the bull trout species throughout its range but made listing decisions only for the five population segments." *Id.* at 1130. Also important was that the court's earlier ruling to reconsider the 1994 finding, on which the new finding was based, limited the agency to making a decision based solely on the 1994 record. Because FWS's distinct population segment policy did not go into effect until 1996, the court said the agency could not rely on it in reconsidering the 1994 decision. *See id.* at 1133. Moreover, by considering only five population segments, FWS ignored the thrust of the original petition to list bull trout throughout the coterminous United States. *See id.* at 1134.

185. Despite the remand, however, the court's order did not interfere with the FWS proposal to list the Klamath and Columbia River distinct population segments. *See id.* at 1136 (noting that "none of this evaluation process is to in any way affect the ongoing listing of the Klamath River and Columbia River population segments").

186. *See supra* note 161 and accompanying text.

187. *See* 58 Fed. Reg. 57,770 (1993); 60 Fed. Reg. 38,011 (1995). Earlier, NMFS denied listing for Columbia River coho on the ground that the remaining remnant wild populations did not constitute an "evolutionarily significant unit" of the species. *See* 56 Fed. Reg. 29,553, 29,553 (1991); *see also* Rohlf, *supra* note 42, at 636–51 (criticizing NMFS's ESU approach to defining "species" for ESA purposes).

188. *See* 58 Fed. Reg. 3662 (1993); 60 Fed. Reg. at 38,011.

1995, NMFS responded by proposing three coho species for listing, including Oregon coho.¹⁸⁹ Although Oregon coho numbered around 1.4 million adults at the turn of the century and supported a productive ocean fishery into the 1970s, their numbers collapsed after 1978 and have remained low ever since.¹⁹⁰ NMFS attributed the decline to a variety of factors, including logging, agricultural practices, urbanization, stream channelization, dams, wetland loss, water withdrawals, unscreened irrigation diversions, and mining practices.¹⁹¹ Also posing problems were hatchery practices, poor ocean conditions, and harvest management practices.¹⁹²

The combination of a congressional moratorium on new ESA listings and a six-month extension that NMFS invoked under the ESA delayed a final decision on Oregon coho until April 1997.¹⁹³ This delay gave Oregon time to develop a program designed to convince NMFS that the existence of the state program obviated the need for a listing. In October 1995, three months after NMFS proposed listing Oregon coho, Oregon governor John Kitzhaber announced a planning effort aimed at warding off a listing.¹⁹⁴ In August 1996, during the congressional moratorium on new listings, the state released a draft program, called the Oregon Coastal Salmon Restoration Initiative. In March 1997, only a month before NMFS's statutory deadline for determining whether to list Oregon coho, the state submitted a revised program.¹⁹⁵ Of the plan's three goals—avoiding a listing, restoring coho populations, and using exclusively existing laws and regulations¹⁹⁶—only the second had anything to do with the health of the salmon. The Oregon

189. See 60 Fed. Reg. at 38,016. NMFS also proposed to list southern Oregon/northern California coast coho and central California coast coho. See *id.*

190. See *id.* at 38,021.

191. See *id.* at 38,024.

192. See *id.* NMFS observed that in recent years harvests had been eliminated or severely circumscribed, but populations continued to decline. See *id.* at 38,025.

193. Under the ESA, final listing determinations must normally be made within one year of proposals. See 16 U.S.C. § 1533(b)(6)(A) (1994). However, a six-month extension is available under 16 U.S.C. § 1536(b)(6)(B) (1994). In April 1995, Congress imposed a moratorium on new listings until the end of September 1996. See Omnibus Appropriations Act, Pub. L. No. 104-134, 110 Stat. 1321, 1321-159 to 1321-160 (1996). When the moratorium ended, NMFS invoked the statutory six-month extension, citing substantial disagreement concerning the sufficiency and adequacy of the agency's data. See 61 Fed. Reg. 56,211, 56,211 (1996).

194. See State of Oregon, *1997 Oregon Coastal Salmon Restoration Initiative* at 2-4 (last modified Mar. 22, 1997) <<http://www.oregon-plan.org/Final.html>>.

195. See *id.*

196. See *id.* at 2-1, 2-3, 7-2.

plan sought to achieve salmon restoration through agency coordination, private volunteer action, increased enforcement of existing state laws, and public education.¹⁹⁷

NMFS was unconvinced that the speculative and voluntary nature of the state program would support a decision not to list Oregon coho. Accordingly, it persuaded the state to enter into a memorandum of agreement (MOA) to provide additional habitat protection measures, including unspecified improvements in forest and agricultural practices, streamflows, and gravel removal regulation.¹⁹⁸ In the MOA the state also committed to implement all measures contained in both the MOA and the state plan;¹⁹⁹ NMFS promised technical support and staff assistance to aid in implementation.²⁰⁰ However, by its terms, either the state or NMFS could terminate the MOA with thirty days' notice.²⁰¹

On May 6, 1997, NMFS decided not to list Oregon coho. It based this decision largely on the measures contained in the Oregon plan and the accompanying MOA, although NMFS also mentioned the habitat protections in the federal Northwest Forest Plan and pointed to improved numbers of spawning coho.²⁰² NMFS did suggest that if the state did not undertake improved habitat protection measures within two years, the agency would reconsider its decision not to list.²⁰³

NMFS's decision not to list Oregon coho was immediately challenged by a number of environmental groups, led by the Oregon Natural Resources Council. On June 1, 1998, U.S. Magistrate Janice Stewart agreed with the environmentalists that NMFS had impermissibly failed to list Oregon coho.²⁰⁴ According to the court, NMFS's finding that Oregon coho was not likely to become an endangered species within the two-year interval between the listing decision and the state's adoption of improved habitat measures was inconsistent with the ESA, which defines a threatened species as any species which is "likely to become an endangered species within the

197. *See id.* at 10.

198. *See State of Oregon & National Marine Fisheries Serv., Memorandum of Agreement* § 7 (April 1997). For example, the MOA authorized NMFS to propose changes in forest practices to the state Board of Forestry or the Oregon Legislature at any time. *See id.* § 7.f.

199. *See id.* § 4.a.

200. *See id.* § 4.b.

201. *See id.* § 12.

202. *See* 62 Fed. Reg. 24,588, 24,588 (1997). NMFS did list the southern Oregon/northern California coho as threatened. *See id.*

203. *See id.* at 24,607-08.

204. *See Oregon Natural Resources Council v. Daley*, 6 F. Supp. 2d 1139, 1152 (D. Or. 1998).

foreseeable future.”²⁰⁵ The court noted that if NMFS could not determine that Oregon coho were not likely to become endangered within the foreseeable future, the species was already in fact a threatened species.²⁰⁶

Judge Stewart also faulted NMFS for relying on state promises of future regulatory measures, when the ESA clearly limited NMFS’s consideration to “existing regulatory mechanisms” in deciding not to list a species.²⁰⁷ Reliance on voluntary measures was also impermissible, according to the court, because they are too speculative; the ESA requires NMFS to rely on current, enforceable measures in making listing determinations.²⁰⁸ Although the court determined that NMFS could rely on implementation of measures in the Northwest Forest Plan as an “existing regulatory measure” that could possibly obviate the need for a listing, the federal plan governed only thirty-five percent of the area in the range of the Oregon coho. Moreover, NMFS had earlier concluded that the habitat protection provided by the federal plan was insufficient, absent adequate protection on nonfederal lands.²⁰⁹

This judicial refusal to allow NMFS to deny listing of a species based on a state program consisting of a patchwork of existing authorities is no doubt a therapeutic development.²¹⁰ Not only was the Oregon plan based largely on speculation and unenforceable promises, it is unlikely that Congress, in enacting the ESA, intended to allow a state program to function in lieu of a federal listing. Statutes that do envision such a prominent role for state regulation, like the Clean Water Act, contain detailed procedures for

205. *Id.* at 1150–51 (citing 16 U.S.C. § 1532(20)).

206. *See id.* at 1152.

207. *Id.* at 1153–54 (citing 16 U.S.C. § 1533(a)(1)(D)). The court also noted that the ESA’s authorization to consider “efforts, if any, being made by any State” in making listing decisions under 16 U.S.C. § 1533(b)(1)(A) referred only to existing efforts. *Id.*

208. *See id.* at 1155.

209. *See id.* at 1157. The court also discounted NMFS’s reliance on harvest cutbacks and improved hatchery measures because (1) the harvest measures in the Oregon plan were only a four-year interim proposal, with no assurance of continuation beyond 2000; and (2) the promised hatchery improvements were contradicted by a NMFS finding that their “full and prompt implementation . . . has not occurred.” *Id.* at 1159–60 (citing 62 Fed. Reg. at 24,598 exhibit 1).

210. The state filed an appeal of the decision to the Ninth Circuit, but subsequently withdrew the appeal. *See* Jonathan Brinkman, *Oregon Abandons Fight with U.S. over Coastal Coho*, *Oregonian*, Jan. 23, 1999, at D1; *Salmon Fight Shifts to East Coast: Lawsuit Filed on Maine as Oregon, Feds Drop Appeal*, *Endangered Species & Wetlands Rep.*, Feb. 1999, at 1 [hereinafter *Salmon Fight Shifts*].

approving and overseeing the operation of state programs.²¹¹ The ESA contains no similar provisions.²¹²

III. THE BIOLOGICAL OPINIONS

The role of federal agencies under the ESA does not end when a species is listed. The species continues to benefit from the Act's protective provisions, including bans on sales, imports, exports, and "takes" of endangered species.²¹³ In addition, federal agencies may not jeopardize the continued existence of species or adversely modify their critical habitat.²¹⁴ In order to fulfill this substantive duty, the ESA prescribes a consultation procedure under which the listing agency, NMFS or FWS, may issue a biological opinion (BiOp) on the proposed federal action.²¹⁵ The effect of this consultation process is to remove decisionmaking authority from action agencies, which propose actions that may adversely affect listed species, and give it to the consulting agencies, NMFS and FWS.²¹⁶ Moreover, the

211. See, e.g., 33 U.S.C. § 1342(b) (1994) (state National Pollution Discharge Elimination System programs); 33 U.S.C. § 1344 (g)–(h) (1994) (state dredge and fill programs).

212. This is not to suggest, however, that state programs like the Oregon plan have no role to play in ESA implementation, only that their existence should not be a justification for denying a listing. The Oregon plan may have an important influence in formulating habitat conservation plans necessary for section 10 incidental take permits, for example. The Oregon plan may also prove to be a model for a state species protection program. On January 8, 1999, Governor Kitzhaber signed Executive Order 99-01, which expanded the state's salmon program beyond Oregon coho to include all native wild salmonids in all areas of the state. The executive order (1) called upon state agencies and local watershed councils to set biological and habitat goals to protect and restore salmonids on a regional basis; (2) required all state agencies to ensure that their actions "to the maximum extent practicable minimize and mitigate adverse effects . . . on salmonids or the habitat they depend on" and to "not appreciably reduce the likelihood of the survival and recovery of salmonids in the wild"; and (3) established a restoration goal of sustainable population levels within the foreseeable future which provide substantial environmental, cultural, and economic benefits to Oregonians in the long term. Oregon Executive Order No. 99-01, § (1)(c)–(e) (1999).

213. See 16 U.S.C. § 1538(a)(1)(A)–(D) (1994) (imports and exports (A); takes (B); and sales (D)). Prohibitions on "taking" of threatened species may be applied by regulation. See 16 U.S.C. § 1533(d) (1994). The ESA defines "taking" to include "harm." See 16 U.S.C. § 1532(19). The ESA regulations define harm to include "significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavior patterns, including breeding, feeding or sheltering." 50 C.F.R. § 17.3 (1998). The regulations were upheld by the Supreme Court in *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon*, 515 U.S. 687 (1995).

214. See 16 U.S.C. § 1536(a)(2) (1994).

215. Only formal consultation results in a biological opinion. See 16 U.S.C. § 1536(b) (1994). For a detailed discussion of formal and informal consultation procedures, see Kilbourne, *supra* note 16, at 525–72.

216. The conclusions in the BiOp technically are not binding on the action agency. See 16 U.S.C. § 1536(b)(3)(A) (describing process by which Secretary produces biological opinion and "suggests" to

statute restricts the discretion of the consulting agencies by requiring NMFS and FWS to employ “best available” science, specify the expected effects of proposals on species and their habitat, and suggest alternatives designed to avoid jeopardizing or adversely modifying designated critical habitat.²¹⁷ The BiOp is thus the means by which the ESA’s principal substantive directives—to avoid species jeopardy or adverse modification to critical habitat—are carried out.²¹⁸

While the ESA’s scope is extensive, its protections remain limited in several ways. In the case of listed Pacific salmon, our study of BiOps and associated litigation underscores the ESA’s remarkable scope, which allows scrutiny of hydroelectric operations, hatchery practices, harvest management, and habitat management. At the same time, the limitations of the ESA’s consultation requirements are apparent because they apply only to federal activities and private actions subject to federal control.²¹⁹ In addition, contrary to some claims,²²⁰ the effect of ESA consultation is hardly draconian, and in fact is quite sensitive to economic considerations.

agency reasonable and prudent alternatives that Secretary believes will allow action to go forward without violating section 7); *see also* *Sierra Club v. Froehle*, 534 F.2d 1289, 1303–04 (8th Cir. 1976); *accord* *Tribal Village of Akutan v. Hodel*, 869 F.2d 1185, 1193 (9th Cir. 1988); *Roosevelt Campobello Int’l Park Comm’n v. EPA*, 684 F.2d 1041, 1049 (1st Cir. 1982). However, the Supreme Court has made clear that BiOps are virtually binding, exerting “a powerful coercive effect on the action agency,” and may be judicially challenged independently of the subsequent action because they have “direct and appreciable legal consequences.” *Bennett v. Spear*, 520 U.S. 154, 169, 178 (1997).

217. *See* 16 U.S.C. § 1536(a)(2), (b)(3)(A).

218. *See* 16 U.S.C. § 1536(a)(2); *see also* *North Slope Borough v. Andrus*, 642 F.2d 589, 607 (D.C. Cir. 1980). A BiOp estimates the effects a proposed federal action will have on listed species and essentially attempts to predict the future state of the species after the proposed action takes place. If the agency performing the BiOp concludes that the post-action state of the species will not jeopardize its continued existence or adversely affect critical habitat, the agency issues a “no jeopardy” BiOp. *See* 16 U.S.C. § 1536(a)(2). If the consulting agency concludes that the post-action state of the species will jeopardize the species’ existence, it issues a “jeopardy” BiOp, which must contain “reasonable and prudent alternatives,” if they exist, that would allow the proposed action to proceed without jeopardizing the species’ existence. 16 U.S.C. § 1536(b)(3)(A); *see also* 50 C.F.R. § 402.14(h)(3), (g)(5) (1998).

219. *See* 16 U.S.C. § 1536(b)(1)(B); *see also* John M. Volkman, *The Endangered Species Act and the Ecosystem of Columbia River Salmon*, 4 *Hastings West-Northwest J. Envtl. L. & Pol’y* 51, 61–64 (1997) (surveying other limitations of ESA in context of Columbia River salmon restoration, including (1) its focus on individual species, not ecosystems; (2) its inability to undo damaging developments that have previously occurred; (3) its emphasis on avoiding jeopardy, rather than ensuring recovery; (4) its relatively closed process of federal consultation, in which interested parties are unable to participate or even observe; and (5) the perception that ESA is uncompromising and fuels political opposition).

220. Detractors of the ESA continue to characterize it as inflexible and draconian. *See, e.g.*, Jonathan Brinkman, *Kitzhaber Champions Resource Cooperation*, *Oregonian*, Dec. 5, 1998, at A1 (explaining the motivation behind Oregon’s Salmon Plan as being to avoid effects of “harsh” and “inflexible” environmental laws like ESA); H. Josef Hebert, *On 20th Anniversary, Endangered Species Act Elicits Admiration, Ire*, *L.A. Times*, Mar. 14, 1999, at B4 (discussing continuing conflict over ESA); Rob

A. Hydropower BiOps

NMFS issued the first BiOp on Columbia Basin salmon in April 1992, shortly after listing Snake River sockeye and chinook.²²¹ The agency determined that 1992 Columbia Basin hydroelectric operations would not jeopardize the continued existence of the listed salmon because changes in the Columbia Basin Fish and Wildlife Program approved by the Northwest Power Planning Council promised to improve survival rates over the previous year's.²²² Although this standard for jeopardy was controversial, because improvements over the previous year would not necessarily counteract the decline of the listed species,²²³ the 1992 BiOp was not challenged in court.

I. Idaho Department of Fish & Game v. National Marine Fisheries Service: *Calling for a "Complete Overhaul" in Hydropower Operations*

NMFS's jeopardy standard was not to go unchallenged for long. In 1993, NMFS refined the standard to embrace a two-step analysis, requiring (1) improved survival over a "base period" of 1986–90, and (2) operations that, in combination with all other human effects on salmon, were reasonably likely to reduce mortalities so that, in the long-term, salmon populations would stabilize.²²⁴ Determining that 1993 hydroelectric

Taylor, *Bulkheads Found to Destroy Some Vital Marine Habitat: A Salmon Fight on the Beach*, Seattle Post-Intelligencer, Mar. 18, 1999, at A1 (expressing concern over "draconian" regulations that will result from listing Puget Sound chinook salmon).

221. See *supra* notes 63, 72, and accompanying text. The discussion of the 1992 and 1993 BiOps and the ensuing litigation is adapted from Michael C. Blumm et al., *Beyond the Parity Promise: Struggling to Save Columbia Basin Salmon in the Mid-1990s*, 27 *Envtl. L.* 21, 42–44 (1997) [hereinafter Blumm et al., *Beyond Parity*].

222. See National Marine Fisheries Serv., *Endangered Species Act Section 7 Consultation/Conference Biological Opinion: 1992 Operation of the Federal Columbia River Power System* (1992) [hereinafter *1992 BiOp*]. On the 1991 amendments to the Columbia Basin Fish and Wildlife Program, see Michael C. Blumm, *Saving Idaho's Salmon: A History of Failure and a Dubious Future*, 28 *Idaho L. Rev.* 667, 690–96 (1992) [hereinafter Blumm, *Saving Idaho's Salmon*].

223. See Steven Daugherty, *Threatened Owls and Endangered Salmon: Implementing the Consultation Requirements of the Endangered Species Act*, 14 *Pub. Land L. Rev.* 203, 242–43 (1993). In the 1992 BiOp, NMFS issued an incidental take statement, allowing takes of the listed salmon so long as the dam operators modified operations to minimize takes. See *1992 BiOp*, *supra* note 222, at 63–72. On incidental take statements, see Kilbourne, *supra* note 16, at 553–56.

224. See U.S. Dep't of Commerce, *Biological Opinion on 1993 Operation of the Federal Columbia River Power System* 10–11, 15 (1993); see also Mark A. Eames, *The Endangered Species Act, the*

operations satisfied both criteria, NMFS again issued a “no jeopardy” opinion, including in its BiOp the rather modest goal of stabilizing salmon populations within four salmon life cycles, or about fifteen years.²²⁵ Idaho and Oregon promptly filed suit, claiming that the 1993 BiOp violated the ESA.

The states alleged that the two-step standard for determining jeopardy was arbitrary,²²⁶ and in March 1994, federal district judge Malcolm Marsh agreed. Marsh determined that both parts of NMFS’s two-part jeopardy test were flawed. First, he concluded that NMFS’s explanation of why it chose the years 1986–90 for the baseline period, years of drought and low salmon runs—allegedly to promote “consistent management practices”—was neither factually accurate nor biologically sound.²²⁷ NMFS had in fact employed longer baselines in its 1992 BiOp,²²⁸ and Judge Marsh decided that the “consistent management practices” standard was biologically suspect because it “necessarily focuses more upon system *capability* than upon the needs of the species.”²²⁹ The choice of a short baseline period of drought years made it relatively easy for NMFS to produce a “no jeopardy” BiOp by claiming that proposed action would actually improve the status quo. Unfortunately for NMFS, Judge Marsh determined that its focus on the “status quo rather than the stabilization of the species” was arbitrary decisionmaking.²³⁰

Second, NMFS’s “no jeopardy” decision was flawed because it relied on life-cycle modeling that discounted pessimistic assumptions.²³¹ Judge Marsh determined that NMFS’s decision to disregard worst-case consequences “without well-reasoned analysis and without considering the full range of risk assumptions” was arbitrary.²³² This approach allowed NMFS to inflate the confidence levels of its optimistic projections and to ignore completely

Federal Columbia River Power System, and the National Marine Fisheries Service, 25 *Env’tl. L.* 389, 395–96 (1995).

225. *See* Eames, *supra* note 224, at 396.

226. *See* Will Whelan, *Idaho’s Strategy in Idaho Department of Fish & Game v. National Marine Fisheries Service*, 25 *Env’tl. L.* 399, 401 (1995).

227. *Idaho Dep’t of Fish & Game v. National Marine Fisheries Serv.*, 850 F. Supp. 886, 893 (D. Or. 1994).

228. In 1992, NMFS used a baseline period of 1984–90 for juvenile salmon and a 1975–90 period for adult salmon. *See id.*

229. *Id.* (emphasis in original).

230. *Id.*

231. *See id.* at 897. NMFS employed three life-cycle models to predict the effect of proposed hydroelectric operations on salmon populations, all of which included numerous uncertainties. Judge Marsh referred to them as “educated guesswork based on ‘crude assumptions.’” *Id.*

232. *Id.* at 898–99.

the risks associated with small populations, where inbreeding and environmental catastrophes can produce extinctions.²³³

To remedy its flawed methodology and arbitrary decisionmaking, Judge Marsh suggested that NMFS modify its analysis in two ways: (1) consider alternative baseline periods, and (2) satisfy the ESA's directive of employing "best available" scientific information by considering the views of "well-qualified scientists such as the fisheries biologists from the states and tribes," the very entities challenging the NMFS BiOp.²³⁴ Judge Marsh concluded his opinion by suggesting that, given the state of Columbia Basin salmon runs, small, incremental steps would not satisfy the ESA:

[T]he process is seriously, "significantly," flawed because it is too heavily geared towards a status quo that has allowed all forms of river activity to proceed in a deficit situation—that is, relatively small steps, minor improvements and adjustments—when the situation literally cries out for a major overhaul. Instead of looking for what *can* be done to protect the species from jeopardy, NMFS and the other action agencies have narrowly focused their attention on what the establishment is capable of handling with minimal disruption.²³⁵

2. *The Evolution of the 1995–99 BiOp: Compromising Salmon Protection*

While the litigation over NMFS's 1993 jeopardy standard was underway, NMFS issued a new BiOp to govern hydroelectric operations for the five-year period of 1994–98, which soon produced additional litigation. On March 16, 1994, just twelve days before the court struck down the 1993 BiOp, NMFS released the new multi-year BiOp.²³⁶ The new BiOp called for an additional 500,000 acre-feet of storage to be devoted to improved fish

233. *See id.* at 897–99 (noting that factoring in worst-case scenarios would lower NMFS's confidence level that salmon populations would rebound to 1990 levels by 2008 to 50% probability).

234. *Id.* at 893, 900 (interpreting 16 U.S.C. § 1536(a)(2)). Oregon intervened in support of Idaho, while the Confederated Tribes of the Umatilla, Warm Springs, and Yakama reservations and the Nez Perce Tribe participated as amici in support of the two states. *See id.* at 890–91. In 1994, the Ninth Circuit reiterated Judge Marsh's admonition to consult expert biologists employed by the states and tribes, in a case involving similar language in the Northwest Power Act. *See Northwest Resource Info. Ctr., Inc. v. Northwest Power Planning Council*, 35 F.3d 1371, 1389, 1391–92 (9th Cir. 1994), *discussed in* Blumm et al., *Beyond Parity*, *supra* note 221, at 44–49.

235. *Idaho Dep't of Fish & Game*, 850 F. Supp. at 900.

236. *See* National Marine Fisheries Serv., *Endangered Species Act Section 7 Consultation Regarding 1994–98 Operation of the Federal Columbia River Power System and Juvenile Transportation Program in 1994–98*, at 7–8 (1994).

flows in the Snake River. It also called for a lowering of Lake Roosevelt, the reservoir formed by Grand Coulee Dam, to 1277 feet to help boost fish flows on the Columbia.²³⁷ Environmentalists challenged that BiOp as well, claiming that it violated the ESA by erroneously relying on truck and barge transport to conclude that hydroelectric operations would not jeopardize the continued existence of the species.²³⁸ Since NMFS had already reinitiated consultation on the multi-year BiOp, the court stayed the proceeding to give the agency time to bring the new BiOp into compliance with the ESA.²³⁹

In January 1995, NMFS began circulating a revised series of draft BiOps which would eventually become the 1995–99 BiOp, superseding the 1994–98 BiOp.²⁴⁰ The progression of some of the provisions in these draft BiOps is instructive. The first draft of the 1995–99 BiOp was released for review by the operating agencies on December 30, 1994. Responding to claims that no changes in the status quo should be made until there was proof that changes would produce benefits, the draft declared that “the ESA does not require that the burden of proof be put on listed species.”²⁴¹ It further observed that “[t]he evidence suggests . . . that transportation alone is not likely the solution to rebuilding listed salmon populations.”²⁴² The draft also called for an additional 3.5 million acre-feet of storage in Canadian reservoirs for fish flow augmentation in the Columbia River, an additional million acre-feet of upper Snake Basin storage for fish flows by 2002 (one-half million acre-feet by 1999), lowering of the lower Snake River reservoirs to near minimum operating pool, and immediate planning for a drawdown of the lower Snake River reservoirs to natural river level.²⁴³ A detailed schedule of minimum flows was also included, as was a justification for the prescribed flows; for example, the document called for biweekly average flows in the Snake River of 85,000 to 100,000 cubic feet

237. *See id.*

238. *See id.*

239. *See Volkman, supra* note 219, at 57.

240. *See* Brief for Federal Appellees at 11, *American Rivers v. National Marine Fisheries Serv.* (9th Cir. 1998) (No. 97-36159).

241. National Marine Fisheries Serv., *Predecisional ESA Document 10,945* (released to operating agencies Dec. 30, 1994).

242. *Id.* at 10,946.

243. *See id.* at 10,957, 10,960–61.

per second from April 10 to June 20 and 50,000 to 55,000 cubic feet per second from June 21 to August 31.²⁴⁴

A subsequent draft, issued on January 25, 1995, included for the first time a conclusion that proposed hydroelectric operations would jeopardize the existence of listed salmon, although it suggested that adoption of a "reasonable and prudent alternative" could avoid jeopardy.²⁴⁵ The suggested alternative contained the same flow targets and reservoir drawdowns as the earlier draft,²⁴⁶ but NMFS now began to define species jeopardy differently, distinguishing between survival and recovery, requiring a "high probability" of survival but only a "moderate to high" likelihood of recovery.²⁴⁷ A February 24, 1995, draft included a provision making "economic mitigation" measures, such as extending irrigators' pumps to reach the lowered reservoir level, a prerequisite to any drawdown of John Day reservoir.²⁴⁸

The final BiOp, released on March 2, 1995, contained the same flow schedule as in the December draft, but required operating agencies only to "take into account the goal of meeting a seasonal average flow objective,"²⁴⁹ there was no requirement to actually achieve a biweekly average flow, as in the December draft.²⁵⁰ Similarly, the requirements to obtain 3.5 million acre-feet of Canadian storage and one million acre-feet of Idaho storage disappeared, replaced by vague exhortations to release water for fish flow enhancement.²⁵¹ The elevation of Grand Coulee

244. See *id.* at 10,956. The document called for flows in the Columbia of 220,000 to 260,000 cubic feet per second from April 20 to June 30, and 200,000 cubic feet per second from July 1 to August 31. See *id.*

245. National Marine Fisheries Serv., *Endangered Species Act—Section 7 Consultation—Reinitiation of Consultation on 1994–98 Operation of the Federal Columbia River Power System and Juvenile Transportation Program in 1994–98*, at 95–96 (predecisional document, Jan. 25, 1995).

246. See *id.* at 100, 104–05.

247. See *id.* at 16 app. 1.

248. See National Marine Fisheries Serv., *Draft Biological Opinion 16* (distributed to operating agencies Feb. 24, 1995).

249. National Marine Fisheries Serv., *Biological Opinion on Reinitiation of Consultation on 1994–98 Operation of the Federal Columbia River Power System and Juvenile Transportation Program in 1995 and Future Years* 103–04 (1995) [hereinafter *1995 BiOp*].

250. See *supra* note 244 and accompanying text. A flow standard that must be met twice a week obviously provides much more dependable flows than one requiring attainment of a seasonal average, for in the latter situation high spring flows may be justification for low summer flows.

251. The 1995 BiOp simply required BPA to negotiate for Canadian storage and stated that the Bureau of Reclamation "should take all reasonable steps to secure additional water," although NMFS expressed doubt that the United States could convince Canada to draw down reservoirs like the Arrow reservoir. See *1995 BiOp*, *supra* note 249, at 95, 98–101.

reservoir, earlier set at 1277 feet, was now set three feet higher.²⁵² The draft retained the provision conditioning the drawdown of the John Day reservoir minimum operating pool on the moving of irrigation pumps, although NMFS stated that “[t]he extension of pumping facilities should be undertaken immediately by the fastest means available.”²⁵³

Most significantly, the final 1995–99 BiOp adopted a dual probability standard for jeopardy: proposed actions must demonstrate a “high likelihood” of species survival, but only a “moderate” likelihood of species recovery.²⁵⁴ The BiOp defined a moderate likelihood as a fifty-percent probability.²⁵⁵ It also eliminated an interim twenty-four-year period by which to judge survival and recovery thresholds.²⁵⁶ Moreover, the BiOp completely ignored adverse effects on critical habitat.²⁵⁷ The BiOp made no attempt to justify any of these changes on biological grounds; NMFS explained them only as reasonable accommodations to cost concerns and other system uses.²⁵⁸ None of the new compromised measures was subjected to biological modeling, so NMFS could not be assured that its selected “reasonable and prudent alternative” would in fact avoid species jeopardy, an apparent statutory violation.²⁵⁹ All of the eleventh-hour changes were concessions to the status quo against which Judge Marsh had earlier warned;²⁶⁰ none favored salmon.

The revised BiOp continued to rely heavily on a program of transporting juvenile fish downstream by truck and barge instead of improving river

252. *See id.* at 95.

253. *Id.* at 113. “Minimum operating pool” is the lowest reservoir level at which navigation locks can operate. *See* Blumm et al., *Beyond Parity*, *supra* note 221, at 55 n.203.

254. *See 1995 BiOp*, *supra* note 249, at 14.

255. *See id.* at 79.

256. *See* Memorandum in Support of Plaintiffs’ Motion for Partial Summary Judgment at 40, *American Rivers v. National Marine Fisheries Serv.* (D. Or. 1996) (Civ. No. 96-00384-MA) [hereinafter *American Rivers’ 1996 Memorandum*].

257. *See* Memorandum Opposing Defendants’ Motion for Summary Judgment and in Support of Plaintiffs Cross Motion for Partial Summary Judgment at 4, 16–17, *American Rivers v. National Marine Fisheries Serv.* (D. Or. 1997) (Civ. No. 96-00384-MA) [hereinafter *American Rivers’ 1997 Memorandum*].

258. *See American Rivers’ 1996 Memorandum*, *supra* note 256, at 43.

259. *See id.* at 43–44 (citing *Idaho Dep’t of Fish & Game v. National Marine Fisheries Serv.*, 850 F. Supp. 886, 891–93 (D. Or. 1994); *City of Carmel-by-the-Sea v. Department of Transp.*, 95 F.3d 892, 899 (9th Cir. 1996)).

260. *See* text accompanying *supra* note 235.

conditions.²⁶¹ NMFS estimated that about seventy-four percent of Snake River spring/summer chinook arriving at Lower Granite Dam would be transported at river flows between 85,000 and 100,000 cubic feet per second.²⁶² The BiOp promised that NMFS would revisit the transportation issue in late 1999 upon the expiration of the 1995–99 BiOp.²⁶³ At that point, NMFS will make a long-term decision as to whether transportation can recover listed salmon, or whether dam breaching will be necessary.²⁶⁴

3. American Rivers v. National Marine Fisheries Service: *Retreating from the "Complete Overhaul" Call*

A coalition of environmental groups challenged the revised BiOp, claiming that it violated the ESA by authorizing mortalities of up to eighty-six percent of juvenile Snake River sockeye and spring/summer chinook and up to ninety-nine percent of fall chinook.²⁶⁵ The environmental groups also challenged the dual standards for jeopardy, dropping the twenty-four-year recovery period, ignoring critical habitat, and failing to implement key measures like the drawdown of John Day reservoir.²⁶⁶ Although Judge Marsh noted that “[a]s a long-time observer and examiner” of salmon restoration efforts, he could not “help but question the soundness of [NMFS’s] selected level of risk tolerance,” he concluded that the ESA “says nothing about risk tolerance and the limits of judicial review dictate that I

261. See 1995 BiOp, *supra* note 249, at 80; see also Volkman, *supra* note 219, at 57 (noting that heavy emphasis on artificial transportation “raise[s] a number of issues about the fate of the Snake River as a home for salmon”). Earlier, environmentalists had unsuccessfully challenged an ESA permit that NMFS issued to the Corps of Engineers allowing the transportation program to proceed under section 10(a)(1) of the statute as a measure to “enhance the . . . survival of the affected species.” 16 U.S.C. § 1539(a)(1)(A) (1994). The environmentalists contended that the transportation permit violated section 10(d) of the ESA, which requires that such “enhancement” permits be consistent with the ecosystem preservation policy of the statute. See 16 U.S.C. §§ 1531(b), 1539(d) (1994). Judge Marsh rejected the challenge, however, noting that although the transportation program had been employed for over twenty years with no success in stemming the decline of wild salmon populations, there was no “direct causal link between the salmon’s decline and the transportation program.” Therefore, he would not substitute his judgment for that of NMFS, because the agency had made a reasoned evaluation of relevant information. See Northwest Resource Info. Ctr., Inc. v. National Marine Fisheries Serv., No. 93-469-MA (D. Or. Apr. 30, 1993).

262. See 1995 BiOp, *supra* note 249, at 112.

263. See *id.* at 93–94.

264. See *id.* at 92–94.

265. See *American Rivers v. National Marine Fisheries Serv.*, No. 96-00384-MA (D. Or. Apr. 3, 1997).

266. See *American Rivers’ 1996 Memorandum*, *supra* note 256, at 39–48; *American Rivers’ 1997 Memorandum*, *supra* note 257, at 4, 6–17.

not interfere with a federal agencies' [sic] exercise of professional judgment or their reasoned decisions.²⁶⁷

Influencing the court was NMFS's claim that it was implementing an "ecosystem management" approach to salmon recovery by establishing a systematic comparison of the ability of transported fish to return to spawn as compared with the fish left in the river.²⁶⁸ In addition, NMFS noted that other species, like bull trout and sturgeon, might suffer from the higher river flows that the environmentalists sought, which also persuaded the court to affirm NMFS.²⁶⁹ Finally, unlike the case three years earlier, the Columbia Basin tribes were split over the BiOp, as the upper basin Colville and Spokane tribes sought to protect reservoir levels in Lake Roosevelt, formed by Grand Coulee Dam, which might be lowered to achieve the river flows that the lower basin tribes advocated.²⁷⁰ Thus, three years after he called for a "major overhaul" in system operations,²⁷¹ Judge Marsh upheld the revised BiOp as not irrational, essentially allowing NMFS to proceed with its experiment comparing the survival levels of transported versus in-river fish until late 1999.²⁷² In March 1999, the Ninth Circuit affirmed Judge Marsh's decision.²⁷³

4. *The Search for Better Science and the PATH Process*

Judge Marsh struck down NMFS's 1993 BiOp, in large part because it ignored the biological advice of the states and tribes.²⁷⁴ In response, one

267. *American Rivers v. National Marine Fisheries Serv.*, No. 96-00384-MA, at 26.

268. *See id.* at 11.

269. *See id.* at 5-6.

270. *See id.* at 6-7. Idaho also flip-flopped. The lead plaintiff in the challenge to the 1993 BiOp, the state now (under a different political administration) supported NMFS's revised BiOp. *See id.*

271. *See supra* text accompanying note 235. Influencing the court was NMFS's acknowledgment that "without major modifications to the Snake and Columbia River dams, it is unlikely [in-river] survivals can be sufficiently improved to ensure the operation of [the dams] does not impede survival and recovery of listed Snake River salmon." *American Rivers v. National Marine Fisheries Serv.*, No. 96-00384-MA, at 13.

272. Several independent scientific reports have recently concluded that transportation is incapable of producing survival levels sufficient to recover Columbia Basin salmon. *See* Michael C. Blumm et al., *Saving Snake River Water and Salmon Simultaneously: The Biological, Economic, and Legal Case for Breaching the Lower Snake Dams, Lowering John Day Reservoir, and Restoring Natural River Flows*, 28 *Envl. L.* 997, 1012-23 (1999) [hereinafter Blumm et al., *The Case for Dam Breaching*] (discussing eight such studies).

273. *See American Rivers v. National Marine Fisheries Serv.*, No. 97-36159 (9th Cir. Mar. 8, 1999), discussed *infra* notes 505, 509, 521, and accompanying text.

274. *See supra* note 234 and accompanying text.

innovation of the NMFS 1995–99 BiOp on hydroelectric operations was to create an independent working group of scientists to assist NMFS in gathering and evaluating the best available scientific information.²⁷⁵ This group, now known as the Plan for Analyzing and Testing Hypotheses (PATH), is comprised of about twenty-five federal, state, tribal, and independent scientists who operate pursuant to accepted scientific procedures and whose work is peer-reviewed.²⁷⁶

The PATH scientists have reached at least interim conclusions that seriously question the BiOp's heavy reliance on transportation. For example, a September 1998 report concluded that breaching the four lower Snake Dams would double the likelihood of recovering the listed Snake River salmon, while continuing the transportation program would decrease recovery chances.²⁷⁷ The final PATH report for 1998 determined that breaching the dams would give Snake River fall chinook a one hundred percent probability of recovery and spring/summer chinook a forty-seven to sixty-five percent probability, depending on how quickly dam breaching got underway.²⁷⁸ On the other hand, the PATH scientists estimated recovery chances under transportation at merely fifteen to thirty-five percent.²⁷⁹ Ironically, NMFS's hydropower BiOp may have set in motion a scientific process that shows that the "reasonable and prudent alternative" the agency selected in its BiOp was based on misguided science.

B. Hatchery BiOps

Hatcheries have been part of the Columbia River ecosystem for over a century. As early as 1877, the Oregon and Washington Fish Propagating Company, with assistance from the federal government, established the first Columbia River Basin hatchery on the Clackamas River in Oregon.²⁸⁰ This and other early efforts were modest and had little effect on the number of fish returning to the river. Nonetheless, they forever changed salmon

275. See 1995 BiOp, *supra* note 249, at 6.

276. See Blumm et al., *The Case for Dam Breaching*, *supra* note 272, at 1020–23.

277. See *Conclusions and Recommendations from the PATH Weight of the Evidence Workshop* 18–19 (1998) [hereinafter *PATH Report*], discussed in Blumm et al., *The Case for Dam Breaching*, *supra* note 272, at 1021; *infra* notes 529–31 and accompanying text.

278. See *PATH report*, *supra* note 277, at 24.

279. See *id.*; see also Margaret Hollenbach, *PATH Presents FY 1998 Final Report*, 25 Columbia Basin Bull. 2 (Dec. 11, 1998) <http://www.nwppc.org/bulletin/bull_25.htm>.

280. See Livingston Stone, *Artificial Propagation of Salmon*, in *The Northwest Salmon Crisis*, *supra* note 3, at 54.

management in the basin.²⁸¹ Every year since 1888, when Oregon took over the Clackamas River hatchery, one or more state, federal, or tribal hatcheries have introduced hatchery-raised fish into the basin.²⁸²

Originally, fishery managers viewed the practice of introducing hatchery-raised fish into the basin as a means of sustaining an already-declining salmon harvest.²⁸³ When that view proved to be inaccurate,²⁸⁴ they continued hatchery production as a panacea for habitat loss from hydroelectric development and as a means to safeguard wild salmon runs by transplanting upriver populations cut off by dams to unrestricted lower river tributaries, where it was hoped they would establish new wild runs.²⁸⁵ Despite massive fiscal outlays and literally billions of hatchery fish introduced into the basin,²⁸⁶ hatchery production failed to protect wild salmon, just as it failed as a fish harvest tool.

Pacific salmon are a highly specialized, genetically diverse family of species susceptible to a broad range of deleterious effects from the introduction of hatchery fish into streams that still support wild salmon populations.²⁸⁷ Because of their high affinity for natal streams and their reproductive isolation, salmon populations are genetically optimized to survive in their local environmental conditions. Hatchery fish threaten that optimization because they carry a different genetic makeup, often ill-adapted to the local environment, and pass those genes to the wild

281. See The Independent Scientific Group, *Return to the River: Restoration of Salmonid Fishes in the Columbia River Ecosystem* 377–78 (pre-publication copy 1996) [hereinafter *Return to the River I*], Executive Summary reprinted at The Independent Scientific Group, *Return to the River: An Ecological Vision for the Recovery of the Columbia River Salmon*, 28 *Envtl. L.* 503 (1998).

282. See *Return to the River I*, *supra* note 281, at 378.

283. Fishery managers assumed that natural spawning was inherently inefficient and, intoxicated by the prospect of an inexhaustible resource, believed they could improve on nature and build a fishery capable of supporting an unrestricted salmon harvest. See *id.* at 378–79.

284. See *id.*

285. The Grand Coulee Fish Management Project collected fish at Rock Island Dam for transplantation to lower river tributaries and hatcheries to compensate for the loss of over 1100 miles of upstream habitat loss caused by constructing Grand Coulee Dam. Similarly, the Lower Snake Compensation Plan produced hatchery steelhead and chinook to mitigate habitat loss in the Snake River Basin from construction of Ice Harbor, Lower Monumental, Little Goose, and Lower Granite dams. See *id.* at 393–95.

286. Hatchery funding has consistently dominated salmon restoration, outstripping expenditures for research, habitat restoration, and improving salmon passage through dams. See *id.* at 388–388A.

287. See Michael L. Goodman, *Preserving the Genetic Diversity of Salmonid Stocks: A Call for Federal Regulation of Hatchery Programs*, 20 *Envtl. L.* 111, 115–18 (1990) (describing salmonid life-history characteristics).

population through hybridization.²⁸⁸ If sustained, introgression—infusing non-native genes into native populations through hybridization with hatchery fish—will eventually replace the wild population’s genetic makeup with less-adapted hatchery genes, decreasing the wild population’s ability to reproduce and survive. Hatchery fish also compete with wild fish for limited food resources, in some cases prey on wild fish, and act as vectors for disease transmission from hatchery to wild populations.²⁸⁹ Even so, hatcheries continue to play a large role in the Columbia River system.²⁹⁰

1. *The 1995–98 Hatchery BiOp: An ESA Overlay to the Patchwork of Hatchery Management*

A patchwork of federal and state statutes authorize hatchery programs in the Columbia River Basin to support salmon harvests and to mitigate the effects of habitat loss from hydroelectric development. Each hatchery is subject to the standards of its authorizing statute. NMFS’s decisions to list the salmon under the ESA provided a framework for considering the combined effect of all hatchery programs on an ecosystem-wide scale.²⁹¹

In 1995, NMFS considered the effect of seventy-one federal and non-federal hatchery programs affecting Snake River salmon, operated by five federal agencies and three states.²⁹² NMFS consulted internally on the operation of twenty-five hatcheries in Oregon and Washington²⁹³ under the Mitchell Act’s authority “to provide for the conservation and maintenance of the fishery resources of the Columbia River.”²⁹⁴ From 1995 to 1998,

288. Hatchery fish are genetically distinct from wild populations for a number of reasons. For instance, hatchery populations stocked from a particular stream are often dispersed to areas other than their natal streams. In addition, through the hatchery-rearing process the population can undergo a number of genetic transformations, ranging from active selection for particular characteristics to natural processes such as genetic drift, which is the random change in gene frequencies over time. After release into streams hatchery and wild fish interbreed, resulting in offspring of mixed genetic stock. *See id.* at 127–34.

289. *See id.* at 134–39.

290. For a discussion of “supplementation,” a new method of using hatchery fish to produce spawning fish rather than harvestable fish, see *infra* notes 309–12 and accompanying text.

291. The continuing litigation in *United States v. Oregon*, 699 F. Supp. 1456 (D. Or. 1988), which created the Columbia River Fish Management Plan, largely governs coordinated regulation of hatchery fish production. *See* Mary Christina Wood, *Reclaiming the Natural Rivers: The Endangered Species Act as Applied to Endangered River Ecosystems*, 40 *Ariz. L. Rev.* 197, 222–24 (1998).

292. *See* National Marine Fisheries Serv., *Biological Opinion for 1995 to 1998 Hatchery Operations in the Columbia River Basin* 8–11 (1995) [hereinafter *1995–98 Hatchery BiOp*].

293. *See id.* at 14.

294. *Id.*; *see also* 16 U.S.C. §§ 755–757 (1994).

FWS proposed to operate fifteen hatcheries and twelve satellite facilities in the Columbia and Snake River Basins,²⁹⁵ mostly as part of the Lower Snake River Compensation Plan,²⁹⁶ to mitigate habitat loss from construction and operation of the four lower Snake River dams.²⁹⁷ The Bonneville Power Administration proposed to support the Umatilla hatchery on the Columbia River below McNary Dam “to re-establish salmon and enhance native steelhead stocks in the Umatilla River Basin.”²⁹⁸ The Corps of Engineers proposed to support seven hatcheries and two satellite facilities in the Columbia, Willamette, and Clearwater Rivers to mitigate habitat loss from construction of dams in the Columbia River Basin.²⁹⁹ The Bureau of Indian Affairs proposed, on behalf of the Colville Confederated Tribes, to support a sockeye salmon hatchery in the upper Columbia River.³⁰⁰ Finally, NMFS also considered the effects of Oregon, Washington, and Idaho state hatchery programs operating under ESA section 10 incidental take permits.³⁰¹ In combination, the programs annually release nearly 200 million hatchery-raised fish.³⁰²

In its BiOp, NMFS analyzed the hatchery programs in comparison to goals it established in its proposed recovery plan for Snake River salmon,³⁰³ which it issued after the agencies conducted their biological assessments. Following an analysis of the environmental baseline for Snake River sockeye, spring/summer chinook, and fall chinook, NMFS concluded that the proposed hatchery operations would jeopardize the continued existence of each species because the hatchery operations were inconsistent with the proposed recovery plan. NMFS expressed particular concern that hatchery production was exceeding the basin’s carrying capacity for Snake River

295. The hatcheries included three to mitigate the effects of the Grand Coulee Dam in Washington, and one on the Deschutes River to support the tribal fishery of the Warm Springs Indian Reservation. See *1995–98 Hatchery BiOp*, *supra* note 292, at 15. For a discussion of the Mitchell Act’s relationship to the salmon fishery, see Columbia River Inter-Tribal Fish Comm’n, *The Mitchell Act: An Analysis* (1981).

296. The Water Resources Development Act of 1976, Pub. L. No. 94-587, § 145, 90 Stat. 2917 (1976), authorized the Lower Columbia River Compensation Plan “to mitigate losses caused by the construction and operation of the four lower Snake River dams and navigation lock projects.” *1995–98 Hatchery BiOp*, *supra* note 292, at 15.

297. See *1995–98 Hatchery BiOp*, *supra* note 292, at 14–15.

298. *Id.* at 15.

299. See *id.* at 16.

300. See *id.*

301. See *id.* at 6. See generally 16 U.S.C. § 1539(a)(1)(B) (1994) (incidental take permits).

302. See *1995–98 Hatchery BiOp*, *supra* note 292, at 6.

303. See National Marine Fisheries Serv., *Proposed Recovery Plan for Snake River Salmon V-4-1 to V-4-49* (1995) [hereinafter *Proposed Recovery Plan*].

salmon.³⁰⁴ The agency therefore proposed a cap on hatchery fish releases for nonrecovery purposes at 1994 levels (20.2 million in the Snake River and 197.4 million total).³⁰⁵ In addition, NMFS determined that the proposed hatchery programs would allow levels of genetic introgression, competition, and predation on listed salmon above what the recovery plan proposed.³⁰⁶ Because the hatchery programs as proposed were inconsistent with the recovery plan proposal, NMFS concluded that they would likely jeopardize the continued existence of listed Snake River salmon. However, NMFS determined that the hatchery programs could proceed by adopting reasonable and prudent alternatives which NMFS designed to address the differences between the proposed hatchery programs and the proposed recovery plan.³⁰⁷

2. *Supplementation: The Nez Perce Tribal Hatchery BiOp*

In 1995 the Columbia River Inter-Tribal Fish Commission, a technical and policy-coordinating body representing the four lower Columbia Basin tribes with treaty fishing rights, released its own plan for salmon restoration in the Columbia River Basin.³⁰⁸ Like NMFS's proposed recovery plan, the tribal plan recognized a role for hatchery production to restore salmon runs. Unlike NMFS's plan, the tribal plan relied on supplementation, a form of hatchery production less intrusive to wild salmon populations than traditional hatchery production.³⁰⁹

Supplementation attempts to avoid the detrimental effects of traditional hatchery practices by producing fish capable of spawning in the wild.³¹⁰ By using only native wild broodstock and creating natural conditions in the hatchery, proponents of supplementation believe they can use artificial propagation as a viable restoration tool. The goal is to produce fish

304. See *1995-98 Hatchery BiOp*, *supra* note 292, at 36.

305. See *Proposed Recovery Plan*, *supra* note 303, at V-4-29 to V-4-31.

306. Because the largest hatchery steelhead are known to prey on sockeye salmon, the 1995-98 Hatchery BiOp adopted a proposed recovery plan provision that would limit the size of steelhead released to between 170 and 220 mm in length. See *1995-98 Hatchery BiOp*, *supra* note 292, at 60, 62.

307. See *id.* at 64.

308. See Columbia River Inter-Tribal Fish Comm'n, *Wy-Kan-Ush-Mi Wa-Kish-Wit: Spirit of the Salmon* (1995) [hereinafter *Spirit of the Salmon*], discussed in Blumm et al., *Beyond Parity*, *supra* note 221, at 75-83.

309. See *id.* at 5B-14.

310. See Jack K. Sterne, Jr., *Supplementation of Wild Salmon Stocks: A Cure for the Hatchery Problem or More Problem Hatcheries?*, 23 *Coastal Mgmt.* 123, 127 (1995).

genetically indistinguishable from wild populations which, when introduced into streams with wild runs, will become part of a healthy wild population. This technique can also be used to reintroduce a species into an area from which it was extirpated.³¹¹ Supplementation is not without critics, however. NMFS, the Northwest Power Planning Council, and environmentalists maintain that there remain risks of genetic introgression; these entities generally support only a cautious, experimental approach to using supplementation.³¹²

Despite its own misgivings over supplementation, NMFS issued a biological opinion in 1997 on the Nez Perce Tribe's hatchery, concluding that the hatchery was not likely to jeopardize the continued existence of listed salmon and steelhead.³¹³ The Nez Perce hatchery is subject to section 7 consultation because it is funded by the federal Bonneville Power Administration and Bureau of Indian Affairs. This supplementation program, located in the Clearwater River sub-basin of the Snake River, proposed a maximum production within ten years of 768,000 spring chinook, two million subyearling smolt fall chinook, and 800,000 subyearling early-run fall chinook.³¹⁴ Using rearing techniques characteristic of supplementation, the Nez Perce hatchery proposed to outplant sufficient fish into tributaries of the Clearwater River to establish healthy, harvestable runs over a twenty-year period.³¹⁵ In addition to the innovative rearing techniques, the Nez Perce hatchery proposed a three-level, ecosystem approach to monitor and evaluate the program.³¹⁶

NMFS allowed the Nez Perce hatchery to proceed even though it concluded that “[a]ny further degradation of [the listed species’ biological requirements] would have a significant impact” on those species.³¹⁷ As it did with the 1995-98 hatchery BiOp, NMFS compared the proposal against its proposed recovery plan. For most listed salmon, the greatest risk of the Nez Perce program would be the potential co-occurrence of hatchery fish with wild fish in either the Clearwater River or the Columbia River migration

311. *See id.* at 128.

312. *See id.*

313. *See* National Marine Fisheries Serv., *Endangered Species Act Section 7 Consultation: Biological Opinion: Nez Perce Tribal Hatchery 1998–2002 Hatchery Operations* 28 (1997) [hereinafter *Nez Perce BiOp*].

314. *See id.* at 3.

315. “Outplant” means to place fish in streams different from those of their natal origin. *See id.* at 4.

316. *See id.* at 7–8.

317. *Id.* at 9.

corridor.³¹⁸ The program would minimize risks because the number of fish released would be less than the cap for the Snake River that NMFS set in its proposed recovery plan.³¹⁹ The Nez Perce program also proposed to limit the amount of genetic introgression into wild populations consistent with NMFS's proposed recovery plan.³²⁰ Therefore, NMFS determined that the program would not likely jeopardize the listed species' continued existence.

NMFS's treatment of hatchery programs in these two BiOps is consistent with the trend of considering hatchery programs collectively at the ecosystem level. NMFS's use of its proposed recovery plan as a baseline for judging the threat of hatchery programs to salmon is one example of this trend.³²¹ Another example is Congress's directive to the Northwest Power Planning Council (NWPPC) to review all federally funded hatchery programs in the Columbia River Basin and to recommend a coordinated hatchery management policy.³²² Part of that directive was a review of hatchery programs by the Independent Scientific Advisory Board to advise the Council on that policy. So far, the result is a draft policy statement that will form the basis for a final report to Congress; the draft policy calls for integrating natural salmon production with hatchery production at the sub-basin level, based on sound scientific principles.³²³

Long-term hatchery management, however, is subject to the outcome of negotiations between the *United States v. Oregon* parties, as well as further consultation with NMFS.³²⁴ The NWPPC draft policy statement did not incorporate the perspective of those two processes because NMFS has yet to release its updated consultation on Columbia River Basin hatchery practices, and ongoing negotiations between the *United States v. Oregon* parties are not conducted in public.³²⁵ As a result, it is uncertain whether the policy will produce any lasting changes in Columbia Basin hatchery management.

318. *See id.* at 10–12.

319. *See id.* at 28.

320. *See id.* at 23–25.

321. NMFS will likely continue this trend when it updates the 1995–98 Hatchery BiOp sometime in 1999. *See id.* at 27–28.

322. *See* Northwest Power Planning Council, *Draft NWPPC Artificial Production Policy Statement: Columbia Basin Hatcheries: A Program in Transition 1* (1999).

323. *See* Barry Espenson, *Hatchery Policy Proposal Goes Public*, 33 Columbia Basin Bull. 5 (Feb. 26, 1999) <http://www.nwppc.org/bulletin/bull_33.htm>.

324. *See id.*; *United States v. Oregon*, 699 F. Supp. 1456 (D. Or. 1988).

325. *See* Espenson, *supra* note 323.

C. Harvest BiOps

Overexploitation of the region's salmon catalyzed the ubiquitous use of hatcheries which are now the foundation of both ocean and in-river harvest programs.³²⁶ Once nearly unregulated, the salmon harvest has evolved into an institutionally managed system of allocating the resource between commercial, recreational, and tribal harvesters.³²⁷ Recent harvests pose less of a threat to salmon survival and recovery than do hydropower, hatchery practices, and habitat loss, because harvest managers have limited the rate of harvest to account for those other threats.³²⁸ Still, any harvest of listed salmon directly affects the population by reducing the number of spawning adults returning to natal streams.³²⁹

Although listed salmon are not the object of harvest activities, they nevertheless suffer some incidental take in both ocean and in-river harvests.³³⁰ To minimize incidental take, harvest decisions are subject to a number of management plans derived from a maze of treaty rights, court orders, and administrative actions.³³¹ Despite this apparently coordinated harvest management, salmon continue to decline throughout the basin.³³² With the listing of Columbia River Basin salmon, NMFS has become a principal decisionmaker in the area of harvest management. In fact, NMFS is arguably now the key harvest manager because, without its approval of incidental takes as part of the consultation process, those harvests would

326. See Marshall McDonald, *Salmon Fisheries of the Columbia Basin*, in *The Northwest Salmon Crisis*, *supra* note 3, at 29–31 (arguing that overfishing was early cause of salmon decline). Two years after the 1894 McDonald report, W.A. Wilcox of the U.S. Fish Commission visited the basin and argued in a local newspaper interview for the hatcheries to satisfy increasing demands for salmon and to offset continuing declines in the harvest. See *Fish and Fisheries*, Morning Oregonian, 1896, in *The Northwest Salmon Crisis*, *supra* note 3, at 31–33.

327. See Mary Christina Wood, *Fulfilling the Executive's Trust Responsibility Toward the Native Nations on Environmental Issues: A Partial Critique of the Clinton Administration's Promises and Performance*, 25 *Env't. L.* 733, 770–78 (1995) (discussing current harvest management and regulation).

328. See National Research Council, *Upstream: Salmon and Society in the Pacific Northwest* 254 (1996) [hereinafter *Upstream*].

329. See *Return to the River I*, *supra* note 281, at 358.

330. See *Proposed Recovery Plan*, *supra* note 303, at ES-6.

331. See Wood, *supra* note 327, at 770–71; see also *Upstream*, *supra* note 328, at 257 (discussing declines in ocean and in-river harvests during 1990s to less than half that amount in 1980s).

332. One study argues that harvest management is ineffective because salmon are not managed "according to the productive capacities of the individual stocks." Instead of targeting spawning escapement to salmon-producing streams, management plans aggregate the stocks into escapement goals at the hydroelectric dams, where there are fish-counting facilities. See *Return to the River I*, *supra* note 281, at 362–63.

require that private individuals secure an incidental take permit from NMFS, a time-consuming and expensive process that would include preparation of a habitat conservation plan.³³³ Thus, NMFS harvest BiOps effectively authorize private takes of listed species.

1. *The 1996 Ocean Harvest BiOp*

Harvest management of Pacific salmon has both international and national components. Internationally, the Pacific Salmon Treaty between the United States and Canada, implemented through the Pacific Salmon Commission (PSC), governs the allocation of salmon between the two countries.³³⁴ Negotiations over this shared resource are often tense, resulting in deadlock and conflict between these neighboring nations.³³⁵ Within the United States, commercial and recreational harvests off the coasts of California, Oregon, and Washington are managed by the Pacific Fisheries Management Council (PFMC) under authority of the Magnuson Fishery Conservation and Management Act of 1976.³³⁶ Through the advice of a Salmon Technical Team and Salmon Advisory Subpanel, the PFMC coordinates federal and state harvest activities.³³⁷ Ultimately, the Secretary of Commerce, through NMFS, makes the final harvest decisions by adopting a fishery management plan (FMP).³³⁸ Because that plan is a federal action, and because NMFS is also the regulatory authority for ESA consultations on salmon, NMFS must consult internally as to whether the plan is likely to jeopardize listed salmon.³³⁹

333. Compare 16 U.S.C. § 1536(b)(3)–(4) (1994) (incidental take statements as part of § 7 consultation), with 16 U.S.C. § 1539(a)(1)(B), (a)(2) (1994) (incidental take permits requiring preparation of habitat conservation plan).

334. See Treaty with Canada Concerning Pacific Salmon, Jan 28, 1985, U.S.-Can., T.I.A.S. No. 11,091 (entered into force Mar. 18, 1985) [hereinafter Pacific Salmon Treaty]. United States implementation of the treaty is authorized by the Pacific Salmon Treaty Act, 16 U.S.C. §§ 3631–3644 (1994). See also *Upstream*, *supra* note 328, at 258–59.

335. See, e.g., *Officials Ask White House to Help Settle Salmon Fight*, News Trib. (Tacoma), Oct. 13, 1998, at B5.

336. See 16 U.S.C. §§ 1801–1883 (1994).

337. See *Upstream*, *supra* note 328, at 258.

338. See 16 U.S.C. § 1854.

339. See National Marine Fisheries Serv., *Endangered Species Act—Section 7 Consultation: Biological Opinion: The Fishery Management Plan for Commercial and Recreational Salmon Fisheries off the Coasts of Washington, Oregon, and California of the Pacific Fishery Management Council 2* (1996) [hereinafter *Ocean BiOp*].

In 1996, NMFS issued a biological opinion on the PFMC's fishery management plan that for the first time considered the plan in terms of its consistency with NMFS's proposed recovery plan.³⁴⁰ Of the Columbia River Basin species, NMFS considered the Snake River sockeye, spring/summer chinook, and fall chinook.³⁴¹ NMFS proposed to continue operation of ocean harvests under the FMP that, among other things, allocated the allowable harvest rate, established management boundaries and zones, and limited the size of fish caught and the allowable gear.³⁴² Returns in the 1990s declined dramatically for all three Snake River species, in some cases to record lows, and escapements were well below amounts needed for species recovery.³⁴³

NMFS determined that the proposed FMP affected only Snake River fall chinook. According to NMFS, the ocean harvests catch few if any Snake River sockeye and only a small number of spring/summer chinook.³⁴⁴ A lack of data, and uncertainty in estimated mortality from the ocean harvest, made it impossible for NMFS to quantify the actual loss of fall chinook.³⁴⁵ However, by modeling harvest rates over a five-year period, NMFS estimated that all ocean harvests combined took forty-three percent of listed Snake River fall chinook.³⁴⁶ The PFMC harvest accounted for approximately twenty-six percent of that total, with Alaskan and Canadian harvests accounting for the remaining seventy-four percent.³⁴⁷

As it has done with hatchery BiOps,³⁴⁸ NMFS compared the ocean harvest rate for Snake River fall chinook against its proposed recovery plan.

340. Prior to 1996, NMFS considered each year's harvest regulations, instead of considering the programmatic goals in the fishery management plan. *See id.* at 1.

341. NMFS also considered the effect of the FMP on Sacramento River winter-run chinook, which was the first salmon species listed under the ESA. *See id.*; 55 Fed. Reg. 12,831 (1990) (codified at 50 C.F.R. § 17.11(h) (1998)); 55 Fed. Reg. 46,515 (1990) (codified at 50 C.F.R. § 227.4(e) (1998)). Because that species is not part of the Columbia River ecosystem, it is not discussed here.

342. *See Ocean BiOp, supra* note 339, at 2–3.

343. *See id.* at 5–6.

344. Some sockeye are caught in ocean harvests, but these are likely descended from Fraser River or Puget Sound stocks. Snake River spring chinook generally have already entered the river system by the time the ocean harvest begins. NMFS was unable to estimate the amount of summer chinook caught because of inconclusive data but agreed with the PFMC's Salmon Technical Team "that it is unlikely that PFMC salmon fisheries significantly impact Snake River summer chinook." *Id.* at 10–12 (citing Pacific Fishery Management Council, *Preseason Report III: Analysis of Council-Adopted Management Measures for 1995 Ocean Salmon Fisheries* (1995)).

345. *See id.* at 13.

346. *See id.* at 13–14.

347. *See id.* at 14.

348. *See supra* notes 303–04, 306–07, 321, and accompanying text.

The proposed plan adopted the management strategies of the PSC, which aimed “to attain naturally spawning chinook escapement goals by 1998,”³⁴⁹ as a baseline for deciding whether the FMP was likely to jeopardize the species’ continued existence. In this context, NMFS concluded that the PSC’s management strategies were unattainable in the short-term, and therefore inadequate. The proposed recovery plan, however, relied on long-term goals set for the international PSC—goals that NMFS determined the PSC could not meet.³⁵⁰

Approximately two-thirds of the ocean harvest mortality of Snake River fall chinook is the result of harvests managed under the Pacific Salmon Treaty.³⁵¹ NMFS noted that since 1993 these harvests failed to meet the proposed recovery plan’s long-term goals for rebuilding chinook stocks. Based on stock status at the time of the BiOp, NMFS determined that it could no longer rely on an agreement between the United States and Canada to protect Snake River fall chinook.³⁵² Instead, NMFS decided that additional short-term measures were necessary—measures it discussed with U.S. fishery managers within the PSC and PFMC, but which were not included in its recovery plan.³⁵³ Assuming the United States and Canada could reach an agreement, NMFS proposed a thirty-percent reduction in chinook ocean harvests for all U.S. and Canadian fisheries. If Canada would not agree to additional reductions, however, NMFS proposed a fifty-percent reduction in U.S. ocean harvests to account for lost benefits from a reduced Canadian harvest.³⁵⁴

349. *Ocean BiOp*, *supra* note 339, at 15–16.

350. *See id.* at 16.

351. *See id.*

352. *See id.* at 15–16.

353. *See id.* at 16–17.

354. *See id.* at 17. After this Article went to press, on June 3, 1999, negotiators for the United States and Canada announced an agreement which, if ratified by both countries, would establish new harvest regimes, replacing expired versions of the Pacific Salmon Treaty. The new provisions call for abundance-based harvest regulations, which will vary from year to year depending on abundance, to replace the old fixed-quota ceilings. Under the new provisions, Canada will reduce harvests of chinook off the west coast of Vancouver Island, where about one-quarter of the fish are of Columbia River origin. In return, U.S. fishermen will reduce their catch of Fraser River sockeye. At the insistence of the Columbia Basin tribes, the agreement also includes a habitat component, the first time the treaty has addressed habitat. The agreement also commits the two countries to establishing two bilaterally managed funds (the U.S. share is \$140 million over four years) to improve fisheries management and scientific information, and to make institutional changes. A separate fund, to be established by the United States and Washington State, will buy back fishing licenses to retire a portion of the state’s sockeye fishery and relieve pressure on the Fraser River sockeye. *See generally* Barry Espenson, *Treaty*

In the absence of an agreement between the United States and Canada, the ESA places the burden for salmon protection on the United States—in this case, on the PFMC and its FMP. According to NMFS, the FMP was inadequate to safeguard chinook because it did not provide for the short-term harvest reductions described above and did not provide for weak-stock protections called for in the proposed recovery plan.³⁵⁵ Consequently, NMFS concluded that the FMP was likely to jeopardize the continued existence of Snake River fall chinook.³⁵⁶ However, NMFS determined that the species would not be jeopardized if the PFMC adopted two reasonable and prudent alternatives. First, NMFS required the PFMC to amend its fishery management plan to be consistent with NMFS's proposed recovery plan.³⁵⁷ Second, absent an agreement between the United States and Canada adopting and implementing the proposed recovery plan's long-term goals, NMFS required either a thirty-percent reduction in both U.S. and Canadian harvests, or a fifty-percent reduction in U.S. harvests.³⁵⁸ In the end, the Ocean BiOp accomplished two significant things: it required the PFMC to implement NMFS's proposed recovery plan, and it made actual harvest reductions dependent on the outcome of negotiations between the United States and Canada under the Pacific Salmon Treaty.

2. *The 1998 Steelhead In-River BiOp*

Managing in-river harvests also plays a crucial role in determining the future of listed salmon in the Columbia River Basin. The Columbia River Compact between Washington and Oregon created an interstate agency that allocates the in-river harvest between tribal and nontribal fishers.³⁵⁹ Not until the tribes sued in federal court, however, were they granted a fair apportionment of the harvest.³⁶⁰ The full extent of the tribes' right—including the right to fifty percent of the harvest—was recognized in *United*

Seen as Boon to Recovery, 46 Columbia Basin Bull. 2 (June 11, 1999) <http://www.nwppc.org/bulletin/bull_46.htm#2>.

355. See *Ocean BiOp*, *supra* note 339, at 17–18, 32.

356. See *id.* at 32.

357. See *id.* at 34.

358. See *id.*

359. See *United States v. Oregon*, 699 F. Supp. 1456, 1459 (D. Or. 1988).

360. See *Department of Game v. Puyallup Tribe*, 414 U.S. 44, 48–49 (1973); see also Blumm & Swift, *supra* note 2, at 449–53 (discussing the trilogy of *Puyallup* cases in the Supreme Court that guaranteed tribes the right to take fish free from discriminatory state regulations).

States v. Washington.³⁶¹ That apportionment also governed in *United States v. Oregon*,³⁶² which continues to allocate salmon harvests in the Columbia River. Since the late 1960s, the District Court of Oregon has overseen the in-river harvest through its continuing jurisdiction in that case, which created the judicially approved Columbia River Fish Management Plan (CRFMP).³⁶³ Disputes over the in-river harvest are routinely resolved by U.S. District Judge Malcolm Marsh.

A well-publicized dispute erupted in 1998 over tribal commercial harvest of fall chinook. The tension began when NMFS's Regional Administrator, William Stelle, Jr., suggested limiting harvest levels for the fall in-river fishery, which would have significantly reduced the tribes' fall chinook harvest.³⁶⁴ Stelle proposed to limit the tribes' catch of listed steelhead from twenty percent to between five and seven percent of the available harvest. This reduction would have limited the tribes' fall chinook harvest because steelhead are caught incidental to the fall chinook harvest. Although the tribes had abstained from harvesting other listed species in the past,³⁶⁵ they were reluctant to do so in this instance because the fall chinook harvest is the tribes' last commercial fishery.³⁶⁶ Eventually, NMFS and the tribes reached an agreement allowing a tribal harvest of fifteen to twenty percent, a reduction from the thirty-two percent allowed under the CRFMP.³⁶⁷ When NMFS and the tribes sought approval of the agreement from the *United States v. Oregon* court, Oregon, Washington, and Idaho objected on the ground that NMFS had not completed a BiOp addressing the effect of the agreement on steelhead.³⁶⁸

The dispute, submitted to Judge Marsh, was significant for two reasons. First, it had the potential to place the tribes' treaty rights at odds with

361. 384 F. Supp. 312, 393, 403-04 (W.D. Wash. 1974); see also Blumm & Swift, *Piscary Profit*, *supra* note 2, at 455-59 (discussing the case).

362. 699 F. Supp. at 1469.

363. In *Sohappy v. Smith*, 302 F. Supp. 899, 911 (D. Or. 1969), a companion case to *United States v. Oregon*, Judge Belloni ruled that treaties entitled the tribes to a "fair share" of the harvests; in 1974, Judge Belloni adopted the 50% harvest share, which Judge Boldt first applied in *United States v. Washington*, 384 F. Supp. at 393. See Blumm & Swift, *Piscary Profit*, *supra* note 2, at 459 nn.248-50.

364. See Courtenay Thompson, *Steelhead Suggestion Limits Tribal Harvests*, *Oregonian*, Apr. 13, 1998, at B1.

365. Even before NMFS listed Columbia River Basin salmon, the tribes restricted their harvest levels to protect summer chinook (1964) and spring chinook (1977). See *id.*

366. See *id.*

367. See *United States v. Oregon*, No. 68-513-MA, op. and order at 4 (D. Or. Sept. 3, 1998).

368. See *id.* at 3.

section 7 of the ESA. The states argued that the ESA requires NMFS to complete a BiOp in response to the CRFMP Technical Advisory Committee's (TAC) biological assessment, which NMFS had not done.³⁶⁹ The tribes countered by contending that the ESA does not apply to the tribes' treaty rights.³⁷⁰ This would mean that NMFS could not directly regulate the tribes' harvest, only other activities contributing to salmon mortalities, such as other harvests and hydroelectric operations. Because Judge Marsh resolved the dispute on another issue, he never reached that critical question.

The issue on which the case turned was whether, as the states argued, the ESA required NMFS to complete a BiOp on the CRFMP, instead of reaching a stipulated agreement in lieu of consultation.³⁷¹ NMFS admitted that if it were to complete a BiOp, the result would be a jeopardy opinion, but countered that there was no agency action triggering the consultation process and therefore no need for a BiOp.³⁷² Judge Marsh disagreed, noting that the statute broadly defines agency action, and that a biological assessment issued by the TAC was sufficient federal involvement to trigger section 7 consultation.³⁷³ Moreover, according to Judge Marsh, the government conceded as much in another case when it acknowledged that states must comply with section 7 for actions taken under the CRFMP.³⁷⁴ That left

369. *See id.*

370. *See id.* at 4.

371. That argument especially vexed the tribes because the states had authorized a state commercial fishery without NMFS issuing a BiOp. The tribes complained to the judge that the states should not be allowed to prevail under those circumstances because they came to court with unclean hands. The states acknowledged that their commercial fisheries had violated the ESA and, presumably in response to the tribes' protests, offered to close their fisheries. *See id.* at 4.

372. *See id.* at 5.

373. *See id.* at 5–6 (citing section 7, 16 U.S.C. § 1536(a)(2) (1994), which defines agency action to include any action "authorized, funded, or carried out by such agency," and *Conner v. Burford*, 848 F.2d 1441, 1455 (9th Cir. 1988)).

374. *See id.* at 5 (citing *Ramsey v. Kantor*, 96 F.3d 434, 442 (9th Cir. 1996)). In *Ramsey*, NMFS completed a BiOp on incidental take of listed salmon as a result of actions taken under the CRFMP. *See Ramsey v. Kantor*, 96 F.3d 434, 439 (9th Cir. 1996). Following NMFS's issuance of the BiOp, the States of Oregon and Washington promulgated fishing regulations implementing measures in the CRFMP. Plaintiffs, a collection of aluminum companies, argued that the states were not applicants to the incidental take permit issued under section 7, and therefore could not promulgate regulations without first obtaining an incidental take permit under section 10 of the ESA, 16 U.S.C. § 1539. *See id.* The Ninth Circuit disagreed, determining that permitted actions under section 7 are not limited to federal agencies, where the taking by a non-applicant was clearly contemplated by the permit. *See id.* at 441–42. The court did not go so far as to say that "every taking that is in compliance with an incidental take statement is, without more, lawful under the ESA." *Id.* at 442. Nevertheless, the court's holding allows the states, at least in the context of the CRFMP, to benefit from a federal agency incidental take statement without

Judge Marsh to decide if he could approve a stipulated agreement without a BiOp on the proposed action.

The crux of the government's and tribes' argument was that because the judge authorized similar agreements in the past, he could do so again.³⁷⁵ Once more Judge Marsh disagreed. First, he distinguished the situation from past agreements where all parties concurred in the stipulation. Second, he candidly noted that he likely erred in executing the two previous agreements without requiring a BiOp.³⁷⁶ Further, Judge Marsh agreed with the states that "the unambiguous language of the statute directs that NMFS must issue a biological opinion responsive to the biological assessment provided by the U.S. Fish and Wildlife Service through TAC."³⁷⁷ He therefore ordered the fishing season closed until NMFS completed a BiOp in accordance with its obligation under the ESA.

In a move that offset part of the effect of Judge Marsh's order, NMFS invoked ESA section 7(d) to allow another week of tribal harvest, based on NMFS's determination that the harvest would not constitute an "irreversible or irretrievable commitment of resources" that would foreclose "the formulation or implementation of any reasonable and prudent alternative measures."³⁷⁸ In the end, however, NMFS had to comply with Judge Marsh's order and complete a BiOp.

going through the costly and time-consuming section 10 permitting process that requires states and private parties to produce habitat conservation plans before receiving an incidental take permit. *See* 16 U.S.C. § 1539(a) (1994) (setting out requirements for issuance of a section 10 incidental take permit).

375. *See United States v. Oregon*, No. 68-513-MA, at 6-7.

376. *See id.* at 7 n.4. Interestingly, the Technical Advisory Committee is just that, an advisory body, with no regulating authority. It is not a federal agency and is not the decisionmaker for purposes of implementing the CRFMP. The TAC produces a "biological assessment" that the U.S. Fish and Wildlife Service forwards to NMFS, but no action is possible without the district court's approval. This raises the question of what is the federal "action" triggering section 7 consultation in this situation. NMFS argued there was no federal action, even though it had produced BiOps on similar actions in the past. *See Ramsey*, 96 F.3d at 442. Despite NMFS's history of producing BiOps under similar circumstances, its argument had merit, given TAC's nonfederal nature and advisory role. The clearest action authorizing the incidental take was Judge Marsh's decision to approve the parties' stipulated agreement, without which no harvest could occur. Under the National Environmental Policy Act (NEPA) regulations, judicial decisions are not considered federal actions. *See* 40 C.F.R. § 1508.12 (1998). In *Ramsey*, the Ninth Circuit disagreed with Judge Marsh's decision that the CRFMP was exempt from NEPA because it is the product of a judicial consent decree. The court noted that "[e]ven if the creation of the [CRFMP] were to be classified as an act of the Judiciary because the plan was created through a consent decree, actions subsequently taken through or under the plan cannot be considered actions by the Judiciary." *Ramsey*, 96 F.3d at 443 n.16. Whether that same rationale applies in the ESA context, in which there is no regulation analogous to NEPA's exemption, is uncertain.

377. *United States v. Oregon*, No. 68-513-MA, at 8.

378. 16 U.S.C. § 1536(d) (1994). The statute states:

On September 10, 1998, less than a week after Judge Marsh's order, NMFS released a BiOp on the effect of the CRFMP on the 1998 fall season fishery and the 1996–1998 Management Agreement between the *United States v. Oregon* parties.³⁷⁹ The BiOp considered a proposal to allow tribal fishing within the zone above Bonneville Dam; the proposal would permit an incidental harvest of fifteen percent of wild B-run steelhead and impose an absolute cap of twenty percent.³⁸⁰ Although NMFS lists salmon based on the ESU concept,³⁸¹ which is grounded primarily on genetic similarity, it analyzed the effects of the proposed action using the fishery management stock concept. The latter is based on the sexual maturity of fish and when they enter the river, because that is how the data are organized.³⁸²

The BiOp determined that the B-run stock of the Snake River Basin ESU was at the greatest risk from the proposed harvests.³⁸³ This ESU is composed of both A-run and B-run fish. Wild A-run fish are in a state of decline, while A-run hatchery fish are relatively abundant. Under the proposed CRFMP, treaty and nontreaty fishers would harvest a total of 9.6% of the ESU's A-run component. In contrast, treaty and nontreaty fishers would harvest 20% and 1.8% of the B-run, respectively.³⁸⁴ NMFS found that amount of harvest significant, especially given the B-run's depressed state. It therefore determined that the proposed CRFMP was likely to jeopardize the continued existence of B-run steelhead—the run

After initiation of consultation required under subsection (a)(2) of this section, the Federal agency and the permit or license applicant shall not make any irreversible or irretrievable commitment of resources with respect to the agency action which has the effect of foreclosing the formulation or implementation of any reasonable and prudent alternative measures which would not violate subsection (a)(2) of the section.

379. See National Marine Fisheries Serv., *Endangered Species Act—Section 7 Consultation: Biological Opinion: Reinitiation of Consultation to Consider Impacts to Listed Steelhead Resulting from 1998 Fall Season Fisheries Conducted Under the Columbia River Fish Management Plan and 1996–1998 Management Agreement 2* (1998) [hereinafter *Steelhead BiOp*].

380. See *id.*

381. See *supra* notes 43–50 and accompanying text.

382. See *Steelhead BiOp, supra* note 379, at 4. Often multiple stocks coexist within the geographic range of a particular ESU. For example, the Snake River steelhead ESU has both A-run and B-run stock components. See *id.*

383. See *id.* at 7. In the Upper Columbia River ESU, wild steelhead declined to approximately 900 individuals in 1998. That number fell far short of NMFS's estimated escapement need of 4500 individuals. Moreover, the population continues to decline, with a replacement ratio of 0.3:1, meaning it takes more than three naturally spawning adults to produce one returning adult fish. See *id.* at 4. The Lower Columbia River ESU is comprised of winter and summer runs and therefore is less susceptible to effects from the fall season harvest. See *id.*

384. See *id.* at 10 tbl.1.

most affected by tribal and recreational fishers. For the other ESUs, NMFS issued “no jeopardy” determinations.³⁸⁵

Having determined that the CRFMP would jeopardize the Snake River Basin ESU, NMFS turned to a discussion of the reasonable and prudent alternatives that would allow the harvest to continue. The greatest threat to the ESU, according to NMFS, is the tribal fishery.³⁸⁶ The original CRFMP proposed a tribal steelhead harvest rate of 32%, although over the past ten years the actual rate had been 24.1%.³⁸⁷ The tribes subsequently agreed to adjust the rate to 20% during negotiations with NMFS, following comments from the NMFS Regional Director about limiting the tribal harvest.³⁸⁸ Thus, the tribes agreed to an actual reduction of 4.1%. NMFS was prepared to allow the 20% harvest rate, but Judge Marsh, responding to the states, forced NMFS to produce the Steelhead BiOp. In the end, however, NMFS found a reasonable and prudent alternative that, if implemented by the tribes, would allow the harvest to proceed.

The alternatives NMFS discussed included using eight-inch minimum mesh size gill nets, adjusting the timing of the harvest to coincide with the peak of the chinook run, and releasing all unmarked fish.³⁸⁹ NMFS believed the last of these, releasing unmarked fish, could further reduce the steelhead harvest rate by as much as five percent without diminishing the tribes’ fall chinook harvest. NMFS concluded that the tribes could reduce incidental harvest of steelhead to at least fifteen percent, if not ten percent, and that such a harvest would not jeopardize the listed steelhead.³⁹⁰ In reaching this conclusion, NMFS conceded that it did not know the degree to which stocks must be improved to guarantee the species’ survival, and that any harvest will negatively affect imperiled steelhead. It noted, however, that a harvest reduced to fifteen percent represented a thirty-eight-percent reduction from a ten-year average tribal harvest rate. Moreover, NMFS emphasized that “[w]hether the species survives will depend primarily on actions taken in other sectors to improve survival.”³⁹¹ In essence, NMFS suggested that any reduction in harvest rates is a positive step forward, but that the species’

385. *See id.* at 11–12.

386. *See id.* at 13.

387. *See id.* at 13, 15.

388. *See id.* at 13; *supra* note 364 and accompanying text (discussing William Stelle’s statement that precipitated conflict).

389. *See Steelhead BiOp, supra* note 379, at 13.

390. *See id.* at 14–15.

391. *Id.* at 15.

survival depends on more than minor adjustments to tribal harvest rates. Following this rationale, NMFS allowed the harvest to continue, deferring to the tribes' discretion as to how they would achieve the harvest rate reductions.³⁹²

The Ocean BiOp and the Steelhead BiOp highlight how the ESA has thrust NMFS into the role of salmon protector and allocation broker between competing interests. In the ocean harvest context, NMFS attempted to fulfill its salmon protector role by incorporating into its reasonable and prudent alternatives a requirement that the Pacific Fisheries Management Council adopt measures in NMFS's proposed recovery plan. Because the recovery plan is now only proposed, it has no force standing alone. By finding jeopardy, however, NMFS was able to make the plan operative through the imposition of reasonable and prudent alternatives to avoid jeopardy.³⁹³

The in-river harvest context highlights NMFS's role as a broker. On one side, the tribes had a strong interest in maintaining their last remaining commercial fishery. On the other hand, NMFS and the states had an interest in limiting the tribes' harvest. Those competing interests threatened to destabilize the system created under the CRFMP by pitting tribal treaty rights to fish against the ESA's protective measures. When the district court refused to accept a stipulated agreement and ordered NMFS to produce a BiOp, NMFS was able to incorporate a negotiated settlement into the BiOp. As it did in the ocean context, NMFS made a jeopardy determination and then used reasonable and prudent alternatives as a tool to accomplish a particular end. One unresolved question is whether NMFS can limit the tribes' harvest while at the same time allowing high mortalities caused by hydroelectric operations, and still fulfill its federal trust obligation to the tribes.³⁹⁴ A recent Secretarial Order on the relationship between the trust obligation and the ESA suggests that NMFS cannot.³⁹⁵

392. *See id.* at 14.

393. When jeopardy is avoided through the imposition of reasonable and prudent alternatives specified by a consulting agency, the ESA makes implementation of those measures mandatory. *See* 16 U.S.C. § 1536(b)(4)(B)(iii) (1994).

394. *See* Wood, *supra* note 327, at 742–49, 794–99.

395. *See* U.S. Dep't of the Interior & U.S. Dep't of Commerce, *Secretarial Order on American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act* at princ. 3(C)(iii) (1997), reprinted in 72 Wash. L. Rev. 1089, 1095–96 (1997) (requiring restrictions on tribal incidental takes to be "least restrictive alternative" available to achieve conservation purpose). The background and significance of the Secretarial Order is discussed in Charles F. Wilkinson, *The Role of Bioterrorism in Fulfilling the Federal-Tribal Relationship: The Tribal Rights-Endangered Species Secretarial Order*, 72 Wash. L. Rev. 1063 (1997).

D. *Habitat BiOps*

Protecting salmon habitat has been a neglected issue of salmon restoration efforts, overshadowed by the perceived need to obtain immediate changes in hydroelectric and hatchery practices. Habitat protection cannot promise short-term improvements in run sizes. In fact, it is hardly clear what the loss of particular spawning and rearing habitat may mean in terms of run size declines. The uncertainties in correlating habitat protection to run sizes have made habitat BiOps an overlooked area of salmon restoration efforts.

Another reason for the relative obscurity of habitat BiOps is that NMFS has taken steps to reduce their prominence. In August 1995, NMFS signed an interagency memorandum of agreement (MOA) with the U.S. Forest Service, the Bureau of Land Management, and FWS, establishing an interagency process to “streamline” project-specific consultations under section 7.³⁹⁶ This MOA was revised by the agencies in February 1997 and is currently employed throughout Idaho, Oregon, and Washington.³⁹⁷ Under the MOA, which was NMFS’s response to congressional concerns that NMFS consultation was impeding timber sales, the agencies establish “level one teams.”³⁹⁸ These teams work cooperatively to improve action agencies’ biological assessments by reaching consensus on whether there is adequate data on the listed species and what the effects of the proposed action will be on the species.³⁹⁹ The upshot is that about three-quarters of consultations under the MOA now culminate in a biological assessment and a NMFS concurrence with an action agency finding that its proposed action is not likely to adversely affect listed salmon or their critical habitat.⁴⁰⁰ This takes place without a BiOp, in effect substituting informal consultation for formal consultation procedures and cutting the typical consultation time in half.⁴⁰¹

396. See National Marine Fisheries Serv., *Biological Opinion on Land and Resources Management Plans for National Forests and Bureau of Land Management Resource Areas in the Upper Columbia River Basin and Snake River Basin Evolutionarily Significant Units 3–4* (1998) [hereinafter *Upper Columbia BiOp*] (discussing 1995 MOA).

397. See *id.* at 4; U.S. Dep’t of Agric. et al., *Streamlining Consultation Procedures Under Section 7 of the Endangered Species Act—February 1997 Procedure Guidance* (1997).

398. Telephone conversation between Greg Corbin and Steve Morris, Head of NMFS’s Habitat Section in the Office of Protected Resources, in Portland, Or. (Feb. 4, 1999).

399. See *id.*

400. For a discussion of biological opinions within “formal” consultation procedures, see 50 C.F.R. § 402.14(h) (1998).

401. Telephone conversation between Greg Corbin and Steve Morris, *supra* note 398.

I. Pacific Rivers Council v. Thomas: *Requiring ESA Consultation for Land Management Plans*

After the listing of Snake River chinook as threatened in April 1992,⁴⁰² the ESA required federal land managers like the U.S. Forest Service and the Bureau of Land Management to evaluate whether a host of their land management activities—principally timber, grazing, and road projects—might affect the listed salmon. Although the land managers agreed to evaluate ongoing and proposed activities through section 7 consultation, they did not agree to subject their land management plans, many of which had only recently been approved, to section 7 consultation. They contended that the ESA did not apply to plans approved before the listing of a species because land management plans were not “ongoing” activities subject to the ESA, but merely “programmatic” documents.⁴⁰³

A coalition of environmental groups, led by Pacific Rivers Council, sued to challenge the Forest Service’s interpretation as it applied to the Umatilla and Wallowa-Whitman National Forests in eastern Oregon and Washington. The district court agreed that the ESA contained no exemption from consultation of previously approved land management plans.⁴⁰⁴ However, although the court enjoined the Forest Service from conducting any new timber sales, issuing grazing permits, or building roads pending compliance with section 7, the court refused to enjoin any ongoing or announced projects.⁴⁰⁵

Both the Forest Service and the environmentalists appealed, and the Ninth Circuit upheld the environmentalists’ position in a July 1994 decision. The court ruled that land management plans, which it described as “comprehensive management plans governing a multitude of individual projects,” had “an ongoing and long-lasting effect even after adoption” and therefore represented ongoing actions subject to section 7.⁴⁰⁶ The court noted that one of the forest plans under review allocated 60,000 acres of public lands surrounding spawning grounds for Snake River chinook by establishing guidelines for logging, grazing, and road-building activities; setting allowable sale quantities of timber; and fixing schedules for forage,

402. *See supra* note 64 and accompanying text.

403. *See Pacific Rivers Council v. Thomas*, 30 F.3d 1050, 1054 (9th Cir. 1994).

404. *See Pacific Rivers Council v. Robertson*, 854 F. Supp. 713, 722–23 (D. Or. 1993).

405. *See id.* at 724–25.

406. *Thomas*, 30 F.3d at 1053.

road-building, and other economic activities.⁴⁰⁷ Given their importance “in establishing resource and land use policies for the forests,” the Ninth Circuit concluded that the ESA required previously approved plans to undergo consultation.⁴⁰⁸ The court also reversed the district court’s ruling that timber sales that had undergone consultation could continue, enjoining the timber harvests until the forest plans governing the sales had undergone consultation.⁴⁰⁹ This decision was subsequently applied to enjoin ongoing timber sales in six national forests in Idaho.⁴¹⁰

The *Pacific Rivers Council* decisions brought section 7 consultation to public land management plans throughout the portion of the Columbia Basin still accessible to salmon.⁴¹¹ Land managers could no longer authorize individual activities governed by a land management plan without considering the plan’s effect on listed salmon and their habitat.⁴¹² The

407. *See id.* at 1055.

408. *Id.* at 1056 (finding that forest plans are ongoing actions subject to consultation requirements under section 7(a)(2) of ESA, 16 U.S.C. § 1536(a)(2)).

409. *See id.* at 1056–57 (finding that timber sales are *per se* irreversible and irretrievable commitments of resources under § 7(d) of ESA, 16 U.S.C. § 1536(d), and cannot proceed until consultation on relevant forest plan is complete). The district court subsequently applied the injunction to road construction and maintenance activities, but allowed grazing and removal of downed timber to continue unless the Forest Service had determined that they would be “likely to adversely affect” listed salmon. *Pacific Rivers Council v. Thomas*, Civ. No. 92-1322-MA, 1994 WL 908600, at *5–6 (D. Or. Oct. 20, 1994).

410. *See Pacific Rivers Council v. Thomas*, 873 F. Supp. 365, 372 (D. Idaho 1995). This injunction was later dissolved after the consultation process was completed. *See Pacific Rivers Council v. Thomas*, 897 F. Supp. 454, 455 (D. Idaho 1995).

411. It may be questioned whether the *Pacific Rivers Council* result could be achieved in the wake of *Ohio Forestry Ass’n v. Sierra Club*, where the Court unanimously ruled that challenges to Forest Service land management plans were not ripe unless the plan authorized site-specific activities. 118 S. Ct. 1665, 1672 (1998). However, the *Ohio Forestry* Court was careful to note that challenges to the NEPA documentation accompanying the plan approval were ripe because a failure to comply with NEPA procedure “can never get riper” than when the failure takes place. *Id.* Similarly, failure to engage in section 7 consultation on land management plans would seem to be ripe when the procedural failure takes place.

412. The initial response to section 7 consultation was the establishment of interim aquatic habitat protections for both salmon and non-salmonid species. *See* U.S. Dep’t of Agric. et al., *Environmental Assessment for the Implementation of Interim Strategies for Managing Anadromous Fish-Producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California* 12 (1994) (amending PACFISH, 15 national forest plans and seven BLM land management plans within range of listed salmon species); Forest Serv., U.S. Dep’t of Agric., *Inland Native Fish Strategy Environmental Assessment* 1 (1995) (amending 22 national forest plans to provide interim riparian protection for non-anadromous fish species). *See generally* Murray D. Feldman, *Snake River Salmon and the National Forests: The Struggle for Habitat Conservation, Resource Development, and Ecosystem Management in the Pacific Northwest*, 3 *Hastings West-Northwest J. Env’tl. L. & Pol’y* 273, 282–85 (1996). The Upper Columbia BiOp reviewed PACFISH protection and found implementation wanting, especially

principle of requiring plan consultation is especially important given NMFS's apparent policy of using the consultation process to enforce provisions in pre-existing area-wide plans.⁴¹³ This obligation to consider salmon habitat in public land decisionmaking encouraged new approaches to land management. For example, the Interior Columbia Basin Ecosystem Management offers the promise of revolutionizing the concept of multiple use in public land management, although it faces an uncertain political future.⁴¹⁴

2. Pacific Coast Federation of Fisherman's Ass'ns v. National Marine Fisheries Service: *Failing to Implement Ecosystem Management*

Land management changes induced by aquatic protection concerns will occur only if the aquatic protections are enforced. The initial efforts were hardly encouraging, as reflected in the events leading to the district court's decision in *Pacific Coast Federation of Fisherman's Ass'ns v. National Marine Fisheries Service*.⁴¹⁵ The case involved the intersection of section 7 and another broad ecosystem management program, the Northwest Forest

concerning grazing standards and monitoring, road standards, and restoration of fish habitat. See *Upper Columbia BiOp*, *supra* note 396, at 26–30, 34–36.

413. See *infra* notes 424–25, 458–61, and accompanying text.

414. See Blumm, *Amphibious Salmon*, *supra* note 29, at 672–74. In May 1997, the Forest Service and the Bureau of Land Management released two draft environmental impact statements (EISs) on the Columbia Basin Ecosystem Management Project. These EISs would amend national forest and BLM land management plans east of the Cascade Mountains, in eastern Oregon and Washington, all of Idaho, western Montana, and small portions of Utah and Nevada. See Forest Serv., U.S. Dep't of Agric. & Bureau of Land Management, U.S. Dep't of the Interior, *Interior Columbia Ecosystem Management Project: Eastside Draft EIS* (1997) [hereinafter *Eastside Draft EIS*]; Forest Serv., U.S. Dep't of Agric. & Bureau of Land Management, U.S. Dep't of the Interior *Upper Columbia River Basin: Draft Environmental Impact Statement* (1997) [hereinafter *Upper Columbia Draft EIS*]. Perhaps because the draft EISs devoted substantial attention to aquatic ecosystems, see *Eastside Draft EIS*, *supra*, ch. 2 at 116–66, 227–29; ch. 3 at 118–57, 199–200; ch. 4 at 132–55; *Upper Columbia Draft EIS*, *supra*, ch. 2 at 103–24, ch. 4 at 132–43, they proved to be extremely controversial politically, and the Republican Congress attempted to de-fund the project several times.

Also, in June 1998, NMFS released a revised BiOp on 18 Forest Service and BLM land management plans within the range of listed salmon and steelhead species, due in part to five steelhead listings in August 1997. See 62 Fed. Reg. 43,937 (1997); see *supra* notes 113–15 and accompanying text. The BiOp concluded that the plans would not jeopardize the listed species. NMFS based this finding largely on a series of measures intended to reduce the adverse effects of implementation of land management plans on the listed species. The land managers had agreed to these measures in their biological assessment as a result of “streamlining” consultation. See *supra* notes 396–401 and accompanying text; see also *Upper Columbia BiOp*, *supra* note 396, at 7–8, 75–80.

415. No. C97-775R (W.D. Wash. May 29, 1998).

Plan, created as a response to the listings of the northern spotted owl.⁴¹⁶ In 1994, a federal district court upheld the Northwest Forest Plan, which includes lands both within and outside the Columbia Basin, although the court cautioned that the plan's legality rested largely on its implementation.⁴¹⁷

In August 1996, a little over two years after the plan's approval, NMFS listed as endangered the Umpqua River cutthroat trout, a species outside the Columbia Basin, citing habitat degradation from logging and recreational fishing as the principal threats to the species' existence.⁴¹⁸ The listing prompted NMFS to issue a BiOp on the effect of the Northwest Forest Plan, and activities authorized by it, on the listed cutthroat and several other species proposed for listing.⁴¹⁹ The BiOp concluded that the aquatic conservation strategy promised by the forest plan would achieve its preservation and restoration objectives, but the BiOp did not specifically consider the plummeting populations of cutthroat and the poor habitat conditions in the Umpqua Basin.⁴²⁰ The BiOp was unable to complete consultation on specific habitat-degrading activities like clearcutting and road building, but it did establish a matrix and checklist to help a team of fishery biologists determine whether additional BiOps would be required to satisfy the ESA.⁴²¹ Although the biologists recommended eliminating clearcuts, the Forest Service and BLM did not eliminate them (although they did eliminate new road construction). In addition, NMFS approved

416. See Forest Serv., U.S. Dep't of Agric. & Bureau of Land Management, U.S. Dep't of the Interior, *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl* (1994). For a critical review of the Northwest Forest Plan, see Henry B. Lacey, *New Approach or Business as Usual: Protection of Aquatic Ecosystems Under the Clinton Administration's Westside Forests Plan*, 10 J. Envtl. L. & Litig. 309 (1995).

417. See *Seattle Audubon Soc'y v. Lyons*, 871 F. Supp. 1291, 1322, 1324 (W.D. Wash. 1994), *aff'd.*, 80 F.3d 1401 (9th Cir. 1996); see also *id.* at 1300 (noting that "any more logging sales than the plan contemplates would probably violate the laws"). NMFS made a one-paragraph determination that the Northwest Forest Plan would not jeopardize listed salmon species. See Letter of J. Gary Smith, Acting NMFS Regional Director, to Robert Jacobs, Interagency SEIS Team (Jan. 13, 1994), reprinted in Forest Serv., U.S. Dep't of Agric., 2 *Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Species Within the Range of the Northern Spotted Owl*, at app. G (1994).

418. See 61 Fed. Reg. 41,514, 41,517-20 (1996) (codified at 50 C.F.R. § 222.23(a) (1998)).

419. See National Marine Fisheries Serv., *Biological Opinion and Conference Opinion on Implementation of Land and Resource Management Plans (USFS) and Resource Management Plans* (1997) [hereinafter *Land Plan BiOp*].

420. See Patti Goldman, *Endangered Species Act Duties*, Big River News, Spring 1998, at 1, 3.

421. See *Land Plan BiOp*, *supra* note 419, at 3, 49.

dozens of timber sales in its BiOps issued in May to July 1997, even though there was no systematic analysis of the cumulative impacts of continuing clearcuts in already-degraded watersheds.⁴²²

A coalition of fishing and environmental organizations challenged the NMFS May–June 1997 BiOp, and a district court enjoined the timber sales, although it did uphold the consultation on the Northwest Forest Plan itself.⁴²³ The case indicates that the plan consultation insisted upon by the *Pacific Rivers Council* court may not receive close judicial scrutiny, due to the level of generality employed in land management plans. Courts will not, however, allow specific projects to proceed on the basis of NMFS's assumptions that the protections promised in the plans will be implemented. Instead, NMFS must demonstrate at the project stage that the activity will comply with the aquatic protection strategy of the Northwest Forest Plan.⁴²⁴ If the *PCFFA* court's approach is widely adopted by other courts, the section 7 process could become a vehicle to ensure that the broad promises made in ecosystem management plans are in fact carried out on the ground. Ironically, the impetus for the plans themselves was a desire to provide some balance to land management decisions that seemed to be driven by ESA requirements.⁴²⁵

If, however, the section 7 process is to become a mechanism to achieve ecosystem management, the courts will apparently have to continue to oversee NMFS. In December 1998, NMFS employed “streamlining” to approve nine of the BLM timber sales enjoined by the *PCFFA* court, with virtually no changes from the proposals contained in BLM's biological assessments.⁴²⁶ NMFS concurred in the timber harvests despite acknowledging that the sale areas “are dominated by conditions rated largely as ‘not properly functioning’ or ‘at risk’,” and that the environmental baseline “does not currently meet all of the biological requirements for the survival and recovery of the listed species within the

422. See Goldman, *supra* note 420, at 3.

423. See *Pacific Coast Fed'n of Fisherman's Ass'ns v. National Marine Fisheries Serv.*, No. C97-775R (W.D. Wash. May 29, 1998), at 27–31 (site-specific project consultation); *id.* at 20–24 (plan consultation).

424. See *id.* at 30.

425. See Blumm, *Amphibious Salmon*, *supra* note 29, at 669 (discussing President Clinton's motivations in spearheading development of Northwest Forest Plan).

426. See Letter from William Stelle, Jr., NMFS Regional Administrator, to Cary Osterhaus, District Manager of Roseburg Bureau of Land Management 10–14 (Dec. 18, 1998) [hereinafter Umpqua Consultation Letter] (regarding section 7 consultation on proposed actions affecting Umpqua River cutthroat trout and Oregon Coastal coho salmon).

action area.”⁴²⁷ NMFS reasoned that there would be no jeopardy to species, because the sales would involve only “minor short-term adverse impacts” like increased sediment loadings, due to mitigation measures such as those contained in the Northwest Forest Plan.⁴²⁸ NMFS reached this conclusion even though some of the sales were within riparian reserves established by the plan, and without considering separately the effect of the sales on designated critical habitat.⁴²⁹ NMFS also seems to have adopted a narrow interpretation of the “action area” in which to assess the cumulative impacts of activities,⁴³⁰ choosing to evaluate only effects on the watersheds immediately affected by the activity rather than effects on the life cycle of the listed species. It seems likely that a court will be asked to review NMFS’s rubber-stamping of BLM’s Umpqua Basin timber sales.⁴³¹ NMFS has suggested, however, that it may employ its ESU concept to delist the Umpqua cutthroat by combining that population with cutthroat populations in southwestern Washington, which may prompt more litigation.⁴³²

3. *The Inland Land BiOp: Taking Seriously Cumulative Impacts and the Environmental Baseline*

Standing in sharp contrast to the Umpqua timber sales BiOps is the Inland Land BiOp. There, NMFS took a contextual approach in concluding that a proposed withdrawal of Columbia River water would jeopardize listed salmon, due largely to the biologically unsatisfactory nature of the Columbia River’s current environment. NMFS determined that the proposed diversion, in the context of existing water withdrawals and likely future withdrawals, would make an already inadequate streamflow regime worse.⁴³³

427. *Id.* at 9.

428. *Id.* at 21–22.

429. *See id.* at 22–23. NMFS assumed that because it concluded that there would be no jeopardy to the species, the statute’s command that there be no adverse effect on critical habitat, 16 U.S.C. § 1536(a)(2) (1994), was automatically satisfied. *See Umpqua Consultation Letter, supra* note 426, at 22. NMFS also assumed that the cumulative effects of nonfederal activities within the project area would remain the same as in recent years. *See id.* at 21.

430. *See* 50 C.F.R. §§ 402.02, 402.14 (1998).

431. *See Pacific Coast Federation of Fisherman’s Ass’ns v. National Marine Fisheries Serv.*, No. C99-67R (W.D. Wash. Mar. 24, 1999) (order granting preliminary injunction).

432. *See Umpqua Cutthroat To Be Combined with Larger ESU, Removed from List, Endangered Species & Wetlands Rep.*, Feb. 1999, at 6. On the ESU concept, *see supra* notes 43–50.

433. *See National Marine Fisheries Serv., Biological Opinion on Inland Land, Inc., Columbia River* iii (1997) [hereinafter *Inland Land BiOp*].

The Inland Land proposal was to build a pumping facility capable of withdrawing up to 303 cubic feet per second from John Day reservoir in the Columbia River, to irrigate land near Boardman, Oregon.⁴³⁴ Because the proposal concerned a project in a navigable waterway, the project needed a permit from the U.S. Army Corps of Engineers,⁴³⁵ which triggered ESA consultation requirements.⁴³⁶ As a result, the Corps wrote a biological assessment concluding that the proposed action would have no adverse effect on listed salmon, but NMFS determined that the assessment was inadequate.⁴³⁷ The Corps then revised its assessment, again concluding that the proposal would produce no adverse effects because the pumping operation's effect on salmon migration would be "nearly immeasurable."⁴³⁸ NMFS emphatically disagreed, concluding in its BiOp that the facility would produce jeopardy to the listed salmon.⁴³⁹

NMFS's reasoning in its Inland Land BiOp was grounded largely on the biologically unsatisfactory state of Columbia and Snake River flows and the role of the proposed project—in concert with existing and reasonably foreseeable future withdrawals—in making the situation worse. NMFS estimated that some thirty million acre-feet of water is now withdrawn for irrigation from Columbia Basin streams each year, which amounts to about forty percent of the average annual natural river flow at McNary Dam in low flow years.⁴⁴⁰ Moreover, NMFS determined that irrigation withdrawals were "the principal reason" that the flow objectives established in its 1995 BiOp on hydroelectric operations went unmet.⁴⁴¹ In fact, NMFS asserted

434. *See id.* at 2.

435. Under section 404 of the Clean Water Act, 33 U.S.C. § 1344 (1994), the Corps issues permits for fill activities in navigable waters, which the statute defines as "waters of the United States." 33 U.S.C. § 1362(7) (1994). Under section 10 of the Rivers and Harbors Act of 1899, 33 U.S.C. §§ 401–415, 502, 687 (1994), the Corps issues permits for construction work in navigable waters.

436. Under section 7(a)(2) of the ESA, all federal agencies must ensure that any action "authorized, funded, or carried out" by the agency is not likely to produce jeopardy to listed species. 16 U.S.C. § 1536(a)(2) (1994). The implementing regulations state that section 7 procedures apply to any discretionary federal agency action. *See* 50 C.F.R. § 402.02 (1998).

437. *See Inland Land BiOp, supra* note 433, at 2. The ESA requires action agencies like the Corps to prepare a biological assessment on major construction activities and activities with similar physical effects, evaluating the proposed project's effects on listed species and its habitat. *See* 16 U.S.C. § 1536(c) (1994); 50 C.F.R. § 402.02. An action agency's determination that the proposal will not likely have adverse effects on listed species must have the written concurrence of the consulting agency, in this case NMFS. *See* 50 C.F.R. § 402.14(a) (1998).

438. *Inland Land BiOp, supra* note 433, at 2, 10.

439. *See id.* at 15.

440. *See id.* at 8.

441. On the flow objectives, *see supra* notes 244, 249–50, and accompanying text.

that “[b]ut for irrigation withdrawals, summer flow objectives [for the Snake River at Lower Granite Dam] would be met every year . . . whereas with withdrawals, summer flow objectives are met less than fifteen percent of the time.”⁴⁴² The situation was similar on the lower Columbia, where summer flow objectives would be met seventy-four percent of the time without irrigation withdrawals, but are met only twenty-six percent of the time with the withdrawals.⁴⁴³

Because NMFS “concluded that flow reductions in the Snake and Columbia Rivers are a cause of decline of listed Snake River salmon,” the agency determined that the existing environmental baseline was inadequate to meet the listed species’ biological requirements. If the agency allowed the proposed withdrawal to proceed, it might have to allow similar future proposals to proceed as well.⁴⁴⁴ Because many water withdrawals are not subject to NMFS scrutiny under ESA consultation requirements,⁴⁴⁵ NMFS decided that the proposal, in combination with the cumulative impacts produced by existing and likely future irrigation withdrawals, would produce species jeopardy.⁴⁴⁶ As a result, NMFS prepared a “reasonable and prudent alternative” to the proposal that would condition the project on “no net loss” of streamflows during the juvenile salmon migration season, installation of a suitable streamflow measuring device, and pumping restrictions designed to ensure that NMFS’s flow objectives are likely to be met on a weekly basis.⁴⁴⁷ These conditions essentially made the project infeasible from the applicant’s perspective.

The Inland Land BiOp has produced allegations that the ESA is unlawfully abrogating state water rights,⁴⁴⁸ because Inland Land had a

442. *Inland Land BiOp*, *supra* note 433.

443. *See id.* at 10. Spring flow objectives were similarly affected by irrigation withdrawals: with the withdrawals, they are met at Lower Granite Dam 64% of the time; without irrigation withdrawals, they would be met 94% of the time. At McNary, with the withdrawals the flow objectives are met 72% of the time; without them, the objectives would be met 92% of the time. *See id.* at 9–10.

444. *See id.* at 12–13.

445. NMFS noted that groundwater withdrawals and intake structures in non-navigable waterways do not require Corps permits, and therefore presumably would not be subject to ESA consultation requirements. *See id.* at 14. These activities could still violate the ESA’s prohibition on “taking” listed species, *see supra* notes 15–16 and accompanying text, but a take would have to be proven, which would likely require a court trial. However, water diversions with federal involvement, like Bureau of Reclamation water deliveries, would require consultation.

446. *See Inland Land BiOp*, *supra* note 433, at 15.

447. *See id.* at 15–16.

448. *See* Bill Crampton, *NMFS Takes Heat over Water Policies*, 12 Columbia Basin Bull. 2 (Sept. 4, 1998) <http://www.nwppc.org/bulletin/bull_12.htm> (discussing charges made by state legislators,

pending water right for the pumping facility, which had been extended repeatedly by the State of Oregon,⁴⁴⁹ and is therefore exempt from the state's ban on diversions from the Columbia River during the salmon migration season.⁴⁵⁰ NMFS responded that its position is usually to "meet ESA water needs consistent with state law," but that courts have required state water right holders to act consistent with ESA requirements.⁴⁵¹ The cases that have considered the intersection between ESA requirements and state water rights have ruled that (1) the Corps of Engineers could require a federal permit from a Colorado water right holder because of ESA concerns in Nebraska;⁴⁵² (2) a California water right holder had to exercise his right in a manner that did not violate ESA taking prohibitions;⁴⁵³ and (3) Texas groundwater pumpers had to observe ESA-imposed restrictions to preserve habitat in an aquifer.⁴⁵⁴ NMFS's restrictions on the Oregon water right holder in the Inland Land case would hardly seem to be different.⁴⁵⁵ Even so, while taking action in the Inland Land case, NMFS has acquiesced in continued water deliveries to irrigators under Bureau of Reclamation contracts, despite Ninth Circuit rulings that existing water contracts are not immune from regulatory requirements, including ESA requirements.⁴⁵⁶

irrigators, and members of Congress at hearing of House Resources Committee held in Pasco, Washington, on September 2, 1998).

449. See *Inland Land BiOp*, *supra* note 433, at 13; Jeff Mapes, *John Day Senator's Surprising Clout Belies Relative Inexperience*, *Oregonian*, Feb. 7, 1999, at C1 (describing political pressure from Oregon legislature to grant additional water-right extension); see also Jeff Mapes & Bill Monroe, *Squirrel Gives Teeth to Dispute About Farming Eastern Oregon Tract*, *Oregonian*, Feb. 20, 1999, at B1 (explaining environmentalists' attempt to derail Inland Land project by petitioning Oregon Fish and Wildlife Commission to list Washington ground squirrel as endangered under state Endangered Species Act).

450. See Or. Admin. R. 690-33-100 to -140 (1998); Joy Ellis, *Drafting from an Overdrawn Account: Continuing Water Diversions from the Mainstem Columbia and Snake Rivers*, 26 *Env't. L.* 299, 311-16 (1996).

451. Letter from William Stelle, Jr., NMFS Regional Administrator, to Congressman Don Young, Chairman of the House Resources Committee (Oct. 21, 1998).

452. See *Riverside Irrigation Dist. v. Andrews*, 758 F.2d 508 (10th Cir. 1985) (requiring individual section 404 permit under Clean Water Act due to potential effects on listed whooping cranes).

453. See *United States v. Glenn-Colusa Irrigation Dist.*, 788 F. Supp. 1126 (E.D. Cal. 1992).

454. See *Sierra Club v. City of San Antonio*, 112 F.3d 789 (5th Cir. 1997) (concerning the Edwards Aquifer).

455. In fact, the Inland Land case would seem to be an easier one than *Glenn-Colusa* or the Edwards Aquifer case, *supra* notes 453-54 and accompanying text. Unlike those cases, Inland Land was a section 7 case, requiring federal avoidance of jeopardy, rather than proving a section 9 "take."

456. See *O'Neill v. United States*, 50 F.3d 677, 686 (9th Cir. 1995); *Natural Resources Defense Council v. Houston*, 146 F.3d 1118, 1125 (9th Cir. 1998), *discussed infra* note 489; see also Barton H. Thompson, Jr., *Takings and Water Rights*, in *Water Law: Trends, Policies, and Practice* 43, 48 (Kathleen Marion Carr & James D. Crammond eds., 1995).

The contrast between NMFS's position in the Umpqua timber sale BiOps and the Inland Land BiOp is remarkable. In the former, NMFS approved new timber sales in an area that already had biologically unsatisfactory habitat due to past timber practices; in the latter, NMFS refused to allow a water withdrawal that the Corps concluded would have a "nearly immeasurable" effect because of concerns that the proposal would exacerbate the biologically unsatisfactory state of river flows.⁴⁵⁷ The difference may be because in the Umpqua BiOp, NMFS could point to the fact that the sales were consistent with the requirements of the Northwest Forest Plan,⁴⁵⁸ an ecosystem management plan that promises both sustainable species and timber harvests.⁴⁵⁹ However, in the Inland Land BiOp, the only relevant ecosystem plan was NMFS's own BiOp on hydropower operations, which had called for specific river flows that had not been met.⁴⁶⁰ Because the ecosystem management plan for the river contained specifics that the forest plan did not, NMFS's decisionmaking on the individual projects at issue was materially different.⁴⁶¹

IV. THE LESSONS

The Columbia Basin is now awash with ESA listings of salmonids. No fewer than twelve Columbia Basin salmonid species are currently under ESA protection. When the decade dawned, there were no salmonid listings at all. Within a seven-year period, the ESA has assumed a dominant role in salmon law and policy in the basin. This Part suggests some lessons emerging from this experience with the ESA.

A. *The Importance of Citizen Petitions*

The role of citizen petitions in bringing ESA protections to Columbia Basin salmon is sometimes overlooked. The initial listings were the result

457. See *supra* notes 438–47 and accompanying text.

458. See Umpqua Consultation Letter, *supra* note 426, at 21 (noting that the sales will follow relevant standards and guidelines of the Northwest Forest Plan and will meet the plan's aquatic conservation strategy's objectives at the watershed scale and in the long run).

459. Some commentators are skeptical, however. See, e.g., Brent Foster, *The Failure of Watershed Analysis Under the Northwest Forest Plan: A Case Study of the Gifford Pinchot National Forest*, 5 Hastings West-Northwest J. Envtl. L. & Pol'y 337 (1999); Lacey, *supra* note 416.

460. See *supra* notes 244, 249, 440–43, and accompanying text.

461. See Houck, *supra* note 107, at 974–78.

of citizen petitions,⁴⁶² just as was the case with the northern spotted owl listings that revolutionized timber management in the Pacific Northwest.⁴⁶³ In effect, the petitioning process is a mechanism that triggers the ESA's science-based decisionmaking, because once NMFS determines that there is credible science supporting the petition, the agency must make listing decisions on biological, not economic, grounds.⁴⁶⁴ Without this "action-forcing" provision of the ESA, it is quite doubtful that the federal government would have decided to list any salmonids, given the widespread changes in land and water use decisionmaking that were sure to result.

B. *The Role of Evolutionarily Significant Units*

One innovation that the salmon petitions prompted was NMFS's concept of an "evolutionarily significant unit" (ESU) as the means of defining which population segments were worthy of ESA protection.⁴⁶⁵ The ESU concept seemed to emphasize reproductive and genetic isolation to the exclusion of other ESA policies such as protecting ecosystem health, conserving endangered domestic populations even though a species is relatively abundant elsewhere in the world, and providing management flexibility in the face of scientific uncertainty.⁴⁶⁶ One result of this emphasis was to enable NMFS to reject listings of certain salmonids, like it initially did in the case of Columbia River coho.⁴⁶⁷ Another was to produce a division between NMFS and its sister agency, FWS, which did not adopt the ESU concept. Instead, it continued to account for geographical distribution and

462. The Shoshone-Bannock Tribe filed the first petition to list Snake River sockeye in March 1990. See 55 Fed. Reg. 22,942 (1990). Two months later, in May 1990, a coalition of environmental groups, including Oregon Trout, Oregon Natural Resources Council, Northwest Environmental Defense Center, American Rivers, and the Idaho and Oregon chapters of the American Fisheries Society, filed a petition to list Snake River chinook. See 55 Fed. Reg. 37,342 (1990).

463. Green World, a nonprofit group in Cambridge, Massachusetts, petitioned the FWS to list the northern spotted owl on January 20, 1987. This was followed by a second petition on August 4, 1987, from the Sierra Club Legal Defense Fund. See 52 Fed. Reg. 48,552 (1987). FWS denied the petition and environmentalists promptly filed suit. See *Northern Spotted Owl v. Hodel*, 716 F. Supp. 479 (W.D. Wash. 1988); Victoria M. Sher, *Travels with Strix: The Spotted Owl's Journey Through the Federal Courts*, 14 Pub. Land L. Rev. 41, 46-47 (1993) (describing initial conflict over listing owl).

464. See 16 U.S.C. § 1533(b)(1)(A) (1994). For a discussion of the listing process, see Rohlf, *supra* note 15, at 42-47.

465. See 56 Fed. Reg. 58,612 (1991).

466. See Rohlf, *supra* note 42, at 636-51.

467. See *supra* note 187.

political boundaries, in addition to genetic isolation, when making listing decisions.⁴⁶⁸

C. *The Role of State Conservation Plans in the Listing Process*

One legacy of the court decisions on salmon listings is that state conservation plans will not substitute for species listings unless they are enforceable. NMFS and FWS remain quite interested in encouraging states to adopt species conservation plans and are in fact preparing a policy to guide states in developing such plans.⁴⁶⁹ The federal district court of Oregon, however, has made it quite clear that states cannot base conservation plans on promises of future regulation and voluntary measures.⁴⁷⁰ According to that court, the ESA demands that state plans qualify as “existing regulatory measures,” meaning “existing enforceable measures.”⁴⁷¹

This precedent may be tested soon in the case of Atlantic salmon.⁴⁷² Even if state plans cannot generally substitute for listings, they may play a role in the formulation of habitat conservation plans necessary for incidental take permits or section 4(d) rules authorizing takes of threatened species.⁴⁷³ The appropriate role of state plans in the implementation of the ESA, first raised in the context of Oregon’s coho plan, has yet to be definitively determined.

D. *The Enlarged Scope of Salmon-Damaging Activities Subject to Scrutiny*

Listing of Columbia Basin salmonids under the ESA had one undeniable effect: it subjected many activities to systematic biological scrutiny for the first time. Prior to the first listings in 1992,⁴⁷⁴ only hydroelectric activities

468. See Rohlf, *supra* note 42, at 657–62.

469. See *Salmon Fight Shifts*, *supra* note 210, at 2.

470. See *supra* notes 207–208 and accompanying text.

471. *Oregon Natural Resources Council v. Daley*, 6 F. Supp. 2d 1139, 1153–55 (D. Or. 1998) (interpreting 16 U.S.C. § 1533(a)(1)(D) (1994)).

472. Maine’s conservation plan is allegedly deficient, prompting a lawsuit from environmentalists. See *Salmon Fight Shifts*, *supra* note 210, at 1 (citing *Defenders of Wildlife v. Babbitt*, No. 99-206 (D.D.C. filed 1999)).

473. See 16 U.S.C. § 1533(d)(1994) (authorizing rules that are “necessary and advisable” to provide for conservation of threatened species); § 1539(a)(1)(B) (1994) (authorizing incidental take permits).

474. See *supra* notes 57, 63, and accompanying text.

were scrutinized closely for their adverse affects on salmon under the provisions of the Northwest Power Act.⁴⁷⁵ Yet, after a decade of efforts under that statute, touted as the most ambitious biological restoration program in the world,⁴⁷⁶ the results were disappointing, and the ESA listings ensued.⁴⁷⁷ The listings induced a more comprehensive approach to salmon restoration than merely changing hydroelectric operations, expanding the focus of inquiry to hatchery, harvest, and habitat activities that were beyond the scope of the Northwest Power Act.⁴⁷⁸ The ESA therefore offered the prospect of designing a restoration program that would address all major sources of salmon mortality, including public land and water use decision-making, not just hydropower.⁴⁷⁹

Perhaps even more significant is that, given the pervasiveness of federal activities in the Columbia Basin, ESA consultation offers the prospect of altering myriad activities threatening listed salmon and their habitat. From hydroelectric operations to hatchery funding to harvest management to land planning, federal involvement in actions adversely affecting Columbia Basin salmon makes the section 7 process the key decisionmaking mechanism in salmon restoration efforts.

E. Some Anomalous Exceptions to the Enlarged Mandate: FERC-Licensed Dam Operations and Bureau of Reclamation Water Deliveries

Despite the broad scope of activities now subject to section 7 consultation, not every federal activity having significant adverse effects on listed salmon has or is undergoing biological consultation. Two glaring exceptions are dam operations licensed by the Federal Energy Regulatory Commission (FERC) and Bureau of Reclamation water management activities.

475. See 16 U.S.C. § 839b(h) (1994).

476. See Blumm & Simrin, *Unraveling Parity*, *supra* note 4, at 661 (citing Northwest Power Planning Council, *1987 Columbia Basin Fish and Wildlife Program* 5 (1987)).

477. See generally Blumm & Simrin, *Unraveling Parity*, *supra* note 4.

478. See Blumm, *Amphibious Salmon*, *supra* note 29, at 662–63.

479. However, it bears noting that about 80% of salmon mortalities in the Columbia Basin are due to hydropower. See *1995 BiOp*, *supra* note 249, at 4. In February 1999, NMFS announced that it would produce a BiOp addressing all forms of salmon mortality, covering hydroelectric operations, hatchery and harvest management, and habitat protection. See Barry Espenson, *Federal Agencies Point Toward New BiOp*, 29 Columbia Basin Bull. 1 (Feb. 26, 1999) <http://www.nwppc.org/bulletin/bull_33.htm#1>.

There is no question that a decision by FERC to relicense a dam is a federal action triggering section 7 consultation.⁴⁸⁰ Thus far, however, operation of federally licensed dams has managed to escape consultation, largely on the basis of two curious judicial interpretations of the Federal Power Act's provision authorizing judicial review of FERC actions. First, a district court ruled that environmental plaintiffs could not challenge FERC's failure to consult on the ongoing effects of a licensed dam because section 313 of the Federal Power Act reserved exclusive jurisdiction over FERC decisionmaking to the circuit courts of appeal.⁴⁸¹ Second, the Ninth Circuit refused to allow another group of environmentalists to challenge FERC's failure to consult on ongoing license operations because it construed section 313 to require a FERC order to trigger judicial review, and FERC refused to act on the environmentalists' request.⁴⁸² The latter result seems inconsistent with a D.C. Circuit decision ruling that FERC could not, consistent with the Federal Power Act, fail to consider protective fish and wildlife conditions in annual operating licenses while a relicensing proceeding was underway.⁴⁸³ If FERC may exempt itself from ESA procedures by inaction, it will effectively enable federally licensed dams to escape the consultation requirements imposed on federally owned dams.⁴⁸⁴

The Bureau of Reclamation is another agency that has thus far managed to escape ESA consultation. The Bureau operates a series of dams in Idaho,

480. Section 7(a)(2) makes consultation applicable to "any action authorized, funded, or carried out" by a federal agency. 16 U.S.C. § 1536(a)(2) (1984). FERC-licensed dams in the Columbia Basin include five mainstem dams on the Columbia, licensed to Washington public utility districts, and the three-dam Hells Canyon Complex on the mainstem Snake, licensed to Idaho Power Company. See Blumm, *Hydropower vs. Salmon*, *supra* note 60, at 238-43.

481. See *Southwest Ctr. for Biological Diversity v. FERC*, 967 F. Supp. 116 (D. Ariz. 1997).

482. See *American Rivers v. FERC*, 170 F.3d 896 (9th Cir. 1998).

483. See *Platte River Whooping Crane v. FERC*, 876 F.2d 109 (D.C. Cir. 1989). The Fish and Wildlife Service had requested consultation under the ESA. See *id.* at 116-17. A subsequent decision clarified that FERC's authority to impose new protective conditions in ongoing licenses was limited to situations in which it had reserved the authority to change conditions in the original license. See *Platte River Whooping Crane v. FERC*, 962 F.2d 27 (D.C. Cir. 1992). Such reserved authority exists concerning the Columbia Basin projects.

484. Nonfederal dams are still subject to consultation at relicensing, and may violate the section 9 prohibition against taking listed species, 16 U.S.C. § 1538(a)(1)(B) (1994), but proving that a taking has occurred may require a trial. To comply with section 9, two of the three public utility districts (PUDs) with dams on the mainstem Columbia have been drafting a habitat conservation plan (HCP). The "no surprises" policy might ensure that the PUDs would not have to change operations not called for in the HCP (or would be compensated for any changes) for 50 years. See *supra* note 16. Thus, the "no surprises" policy may encourage nonfederal entities to prepare HCPs to obtain section 10 permits to authorize takes, rather than rely on "incidental take statements" in BiOps, because they may be able to obtain insulation from operational changes for a period of time that is longer than their license terms.

Oregon, and Wyoming, collectively storing 6.5 million acre-feet of water.⁴⁸⁵ Neither the Bureau's operation of these dams nor its water deliveries to irrigators, some of which are not authorized to receive such federally stored water, has ever been subject to comprehensive analysis in a BiOp.⁴⁸⁶ Yet the Bureau's water management activities have significant effects on Snake River flows, thereby adversely affecting listed salmon.⁴⁸⁷ Moreover, in 1996 the Bureau signed an agreement with Idaho Power Company, the FERC licensee operating the Hells Canyon dams, in which the Bureau agreed to limit flows in a way that ensures that salmon flow targets downstream on the Snake River usually will not be met.⁴⁸⁸ Neither that agreement nor its implementation has ever been subject to consultation, and environmentalists have sent the Bureau a notice of intent to sue under the ESA.⁴⁸⁹

The evasion of ESA consultation by FERC and the Bureau shows that, while the ESA has subjected most salmon-damaging activities of the federal government to consultation, the statute is not yet truly comprehensive in subjecting salmon-damaging activities to biological scrutiny. Since the ESA does not authorize NMFS to make recalcitrant agencies consult, the burden to ensure compliance is apparently left to environmentalists using the ESA's citizen suit provision.⁴⁹⁰

F. *The Evolution of NMFS as a Regulatory Agency*

In the era before the ESA began to dominate salmon law and policy, NMFS was an active member of the Columbia Basin Fish and Wildlife Authority (CBFWA), an interagency group of federal, state, and tribal fish

485. See American Rivers et al., *Notice of Intent to Sue for Violations of the Endangered Species Act* 3 (1997) [hereinafter *Notice of Intent to Sue*].

486. NMFS recently wrote a draft BiOp on the Bureau's Snake River operations, but that analysis only considers efforts to obtain the 427,000 acre-feet of water for fish flows called for in NMFS's existing BiOp; it does not evaluate the effects of Bureau project operations on listed salmon. See National Marine Fisheries Serv., *Draft Biological Opinion on Bureau of Reclamation Operations and Maintenance of Its Projects in the Snake River Basin Above Lower Granite Dam* (Apr. 8, 1999) <<http://www.nwr.noaa.gov/1hydro/p/age.pdf>>.

487. See *Notice of Intent to Sue*, supra note 485, at 3.

488. See *id.* at 4.

489. See *id.* In *Natural Resources Defense Council v. Houston*, 146 F.3d 1118 (9th Cir. 1998), the court held that the Bureau's failure to complete section 7 consultation prior to renewing water supply contracts violated the ESA, and that the trial court acted within its discretion in ordering that the contracts be rescinded. See also *O'Neill v. United States*, 50 F.3d 677 (9th Cir. 1995), where the court ruled that Bureau contract language absolved the government of liability for its failure to deliver the full contractual amount of water due to a shortage caused by statutory environmental mandates.

490. See 16 U.S.C. § 1540(g) (1994).

and wildlife agencies in the region. In 1990, CBFWA argued that the Northwest Power Planning Council should adopt a schedule of biologically based minimum streamflows as part of its Columbia Basin Fish and Wildlife Program, but the Council refused.⁴⁹¹ Whereas CBFWA called for flows of 140,000 cubic feet per second in the Snake River during the peak spring migration season, the Council's 1991 program included only 85,000 cubic feet per second, just sixty percent of what CBFWA recommended.⁴⁹²

One might have expected that once NMFS was transformed from a commenting agency into a decisionmaking agency by virtue of the salmon listings under the ESA, the agency would move to implement the flow recommendations it had earlier supported. Yet, once vested with decisionmaking authority, NMFS surprisingly saw the merit in lower flows, calling for flow "targets" of just 85,000 to 100,000 cubic feet per second in the Snake during the spring migration season. NMFS also sanctioned a system in which most juvenile fish are removed from the river and transported by truck or barge downstream.⁴⁹³ Because NMFS never attempted to explain why the CBFWA flows were biologically unjustified, one possible inference is that, once NMFS obtained decisionmaking authority, the agency biologists who subscribed to the CBFWA flows were supplanted by more politically savvy agency managers. The numerous eleventh-hour compromises that NMFS made in its 1995–99 hydropower BiOp⁴⁹⁴ reinforced the impression that NMFS made decisions based on nonbiological factors. How this decisionmaking is consistent with the ESA is hardly clear.

491. See Blumm & Simrin, *Unraveling Parity*, *supra* note 4, at 707–08 (proposed flows); Blumm, *Saving Idaho's Salmon*, *supra* note 222, at 690–96 (describing the Council's 1991 amendments).

492. See Blumm & Simrin, *Unraveling Parity*, *supra* note 4, at 708; Blumm, *Saving Idaho's Salmon*, *supra* note 222, at 690. In 1994, the Council approved program amendments which included "sliding scale" flows of 85,000 to 140,000 cubic feet per second in the Snake River during the peak migration season, varying depending on water years. Those flows have never been implemented by project operators, however, in part because the operators have assumed that the flows NMFS called for under the ESA, *see supra* notes 244, 249–50, took precedence. See Blumm et al., *Beyond Parity*, *supra* note 221, at 52 (discussing 1994 amendments), 61 n.253 (discussing questions about program's enforceability), 64–65 (arguing that Council's program is no less enforceable than ESA BiOps).

493. See Blumm et al., *Beyond Parity*, *supra* note 221, at 65 (discussing flows), 71–73 (discussing the transportation program).

494. See *supra* notes 249–60 and accompanying text.

G. *The Vague Substance of BiOps*

Despite the ESA's reputation as a statute with more substance than process, the BiOps studied in this article include a great deal of process. The hydropower BiOp included numerous studies aimed at producing information useful to NMFS in making its promised 1999 decision on whether to continue to truck and barge juvenile salmon or to call for breaching some dams.⁴⁹⁵

The habitat BiOp's reliance on "streamlining" has interjected a considerable amount of pre-BiOp process into ESA consultation.⁴⁹⁶ Moreover, sometimes the substance that does appear in the BiOps is less than meets the eye. For example, the hydropower BiOp sets flow "targets."⁴⁹⁷ The enforceability of these targets is highly unclear; they appear to be aspirational goals, not mandatory requirements.

Other apparently substantive provisions have been creatively interpreted by NMFS to remove their substantive bite. For example, by interpreting "economic mitigation" to mean a prerequisite to implementing the John Day drawdown, NMFS effectively made that measure unenforceable.⁴⁹⁸ Finally, NMFS has largely ignored some issues, such as how tolerant a BiOp will be toward environmental risk. In his review of hydropower BiOps, Judge Marsh twice remarked that he questioned the willingness of NMFS to tolerate a considerable amount of risk, although in the second case he declined to strike down NMFS's BiOp.⁴⁹⁹

H. *The Uncertain Standard for Species Jeopardy*

Related to the issue of NMFS's tolerance for environmental risk is the agency's apparent willingness to accept fairly modest probabilities for species recovery. Because the ESA does not define the term jeopardy, NMFS has been using different probabilities on an ad hoc basis in its BiOps. In the hydropower BiOps, for example, NMFS required a "high probability" of both survival and recovery until the 1995–99 BiOp, when

495. See *supra* notes 263–64, 272, 426–32, and accompanying text.

496. See *supra* notes 396–401 and accompanying text.

497. See *supra* notes 249–50 and accompanying text.

498. See *supra* note 253, *infra* notes 516–23, and accompanying text.

499. See *Idaho Dep't of Fish & Game v. National Marine Fisheries Serv.*, 850 F. Supp. 886, 897–99 (D. Or. 1994) (ruling that NMFS's discounting of "worst case" risks in modeling was arbitrary and capricious); *American Rivers v. National Marine Fisheries Serv.*, No. 96-00384-MA, at 26 (D. Or. Apr. 3, 1997) (quoted *supra* text accompanying note 267).

the agency began to differentiate between survival and recovery and required only a "moderate to high probability" of recovery.⁵⁰⁰ This translated into a seventy-percent probability of survival, but just a fifty- to seventy-percent chance of recovery.⁵⁰¹ NMFS offered no explanation of why these probabilities were sufficient to avoid jeopardy, nor the reason why it began to distinguish between survival and recovery. Neither did NMFS attempt to explain why it eliminated the twenty-four-year period for measuring recovery.⁵⁰² These unexplained shifts in position led to a lawsuit⁵⁰³ and created the suspicion that NMFS was willing to change standards to avoid having to require more-than-minimal changes in the status quo of hydroelectric operations, something Judge Marsh earlier accused NMFS of doing.⁵⁰⁴ The Ninth Circuit affirmed NMFS's reduced probability standard for achieving recovery, however, noting that the applicable regulation contained no quantitative measure, that its interpretation in the Hydro BiOp was case-specific, and that it was the product of a reasoned approach to scientific uncertainty.⁵⁰⁵

I. The Failure to Account for Critical Habitat

NMFS's salmon BiOps either ignore the ESA directive not to adversely affect a species' critical habitat, or they treat it as the equivalent of the requirement to avoid species jeopardy.⁵⁰⁶ Yet these are two distinct ESA obligations.⁵⁰⁷ NMFS's failure to consider separately the effects of proposed actions on critical habitat was the subject of a court challenge. Environmentalists argued to the Ninth Circuit that the statute, regulations, and agency interpretations all reflect an intent to avoid adversely affecting critical habitat and to provide listed salmon with additional protection beyond that provided by the no jeopardy standard.⁵⁰⁸ However, the Ninth

500. See *supra* notes 247, 254–55, and accompanying text.

501. See, e.g., *1995 BiOp*, *supra* note 249, at 134 (discussing Snake River fall chinook).

502. See *supra* note 256 and accompanying text.

503. See *supra* notes 265–73 and accompanying text.

504. See *supra* text accompanying note 235.

505. See *American Rivers v. National Marine Fisheries Serv.*, No. 97-36159, slip op. at 9–10 (9th Cir. Mar. 8, 1999) (mem.).

506. See, e.g., *1995 BiOp*, *supra* note 249, at 82; Umpqua Consultation Letter, *supra* note 426, at 22.

507. The ESA and the implementing regulations specifically require that federal agencies must ensure that their actions do not adversely modify designated critical habitat. See 16 U.S.C. § 1536(a)(2), (b)(3)(A) (1994); 50 C.F.R. § 402.14(g) (1998).

508. See Brief for Appellants at 17–27, *American Rivers v. National Marine Fisheries Serv.*, (9th Cir. 1998) No. 97-36159 [hereinafter Brief for Appellants].

Circuit rejected the challenge.⁵⁰⁹ This judicial lack of interest seems to have sanctioned NMFS's continued indifference to effects on designated critical habitat in its BiOps. As one commentator explained, "[t]he apparent insignificance of the critical habitat process in the Columbia appears paradoxical in light of the Endangered Species Act's express policy to take an ecosystem perspective in implementing the Act."⁵¹⁰

J. The "Streamlining" of the Consultation Process

The MOA authorizing "streamlining" of the consultation process⁵¹¹ has reduced the significance of the content of BiOps, as much of the mitigation has become the product of negotiations among interagency "level one teams" that inform the action agency's biological assessment.⁵¹² The result in the case of the Umpqua timber sales was that NMFS used "streamlining" essentially to rubberstamp the biological assessments, imposing no new significant requirements as a result of its review.⁵¹³

There is nothing in the ESA that expressly forbids using "streamlining" to produce biological assessments with mitigation measures, enabling an agency action to avoid species jeopardy or adverse modification to critical habitat. The upshot of "streamlining," however, is to place greater emphasis on interagency negotiations than on the biological expertise of a consulting agency like NMFS. The product of these negotiations is a written biological assessment, but the interagency negotiations are entirely off the record. While it is true that the current consultation process authorized by section 7 of the ESA does not envision a role for public involvement, "streamlining" further reduces the public role; the public is not allowed even a

509. See *American Rivers v. National Marine Fisheries Serv.*, No. 97-36159, slip op. at 6-7 ("NMFS reasonably explained the close relationship between jeopardy and critical habitat and identified certain effects of the dam operations (e.g., reduction of water velocity and increase in water temperature) that both jeopardize the species themselves and adversely modify the species' critical habitat Given NMFS's expertise in this area, the nature of the proposed action (dam operations), and the species' habitat at issue here, we cannot say that NMFS's conclusion in the 1995 BiOp that the jeopardy analysis 'encompasses' the critical habitat analysis was arbitrary and capricious.").

510. Volkman, *supra* note 219, at 58-59 ("If the Endangered Species Act were focused first and foremost on protecting ecosystems functions, the critical habitat process might identify the fundamental conditions toward which the Endangered Species Act process would be geared. However, this is not what has happened in the Columbia. Rather, decisions are aimed at reducing salmon mortality levels at various points in the salmon migration, which is consistent with a focus on listed species rather than the ecological processes on which species depend.").

511. See *supra* notes 396-401 and accompanying text.

512. See *supra* note 398 and accompanying text.

513. See *supra* notes 426-30 and accompanying text.

glimpse at interagency disagreements that might exist between the action agency and the consulting agency. Thus, although “streamlining” may reduce charges that consulting agency BiOps are blocking developments,⁵¹⁴ there is little to suggest that it will improve the biological effectiveness of the measures adopted as a result of the ESA consultation process.

K. *The Failure to Implement BiOps*

Continuing a tradition established by the Northwest Power Planning Council, which for years made no attempt to enforce salmon-protective provisions in its Columbia Basin Fish and Wildlife Program,⁵¹⁵ NMFS has not been a vigilant enforcer of the provisions in its BiOps. The most notorious example is the requirement in NMFS’s 1995–99 hydropower BiOp calling for a drawdown of the John Day reservoir to near-minimum operating pool, or the minimum elevation at which Congress authorized the reservoir to be operated.⁵¹⁶ The Corps of Engineers has never implemented this measure because NMFS conditioned implementation on providing “economic mitigation” to parties that would be adversely affected by the measure, such as irrigators who would need to extend their pumps to reach the lowered reservoir. The Corps concluded it possessed no authority to provide such mitigation.⁵¹⁷

Although the Ninth Circuit ruled that an action agency like the Corps may deviate from NMFS’s prescriptions, the court made clear that any such deviation was permissible only where the agency had adopted “alternative, reasonably adequate steps to insure the continued existence of any” listed species.⁵¹⁸ The John Day drawdown would produce biological benefits equivalent to augmenting streamflows with three million acre-feet of storage water (over half the active storage behind the Grand Coulee

514. See *supra* note 398 and accompanying text.

515. See, e.g., Blumm & Simrin, *Unraveling Parity*, *supra* note 4, at 684, 688–89, 726, 738.

516. See Blumm et al., *Beyond Parity*, *supra* note 221, at 55 n.203 (defining minimum operating pool), 66–67 n.291 (discussing the John Day drawdown).

517. See Brief for Appellants, *supra* note 508, at 28; North Pacific Div., U.S. Army Corps of Eng’rs, *Record of Decision on Reservoir Regulation and Project Operation, 1995 and Future Years* 14 (1995). The Bonneville Power Administration, an agency that once concluded that it had implied authority to fund a \$7 billion nuclear power plant construction program, also concluded that it possessed no authority to fund “economic mitigation” measures. See Blumm et al., *Beyond Parity*, *supra* note 221, at 67 n.291.

518. *Village of Akutan v. Hodel*, 869 F.2d 1185, 1193 (9th Cir. 1988). In *Akutan*, the court specifically determined that the agency had taken such steps, and that as a result, the remaining risk to the listed species from the agency’s action was “virtually nonexistent.” *Id.* at 1194.

Dam),⁵¹⁹ but the Corps produced no alternative measures with any remotely comparable benefits to migrating salmon. Failure to implement this measure seems a clear violation of the ESA, as environmentalists argued before the Ninth Circuit.⁵²⁰ The court, however, disagreed.⁵²¹ Thus, NMFS's sensitivity to the potential adverse economic effects of its BiOp, coupled with action agency claims of lack of authority to fund measures to protect economic interests,⁵²² have apparently blocked implementation of a measure that independent scientists have suggested could produce significant biological benefits.⁵²³

L. *The ESA and the Production of Scientific Information*

The ESA requires decisionmaking based on the “best scientific . . . data available.”⁵²⁴ How to develop the best available scientific information has been a continuing source of concern. Under the Northwest Power Act, the Northwest Power Planning Council established an Independent Scientific Group and asked it to evaluate its salmon restoration program.⁵²⁵ The scientists produced a detailed report in 1996 that criticized the Council's program and called for “normative” river conditions, including drawdowns of mainstem reservoirs to natural river levels and less reliance on technical

519. See 1995 BiOp, *supra* note 249, at 114.

520. See Brief for Appellants, *supra* note 508 at 28–32. In *Sierra Club v. Marsh*, 816 F.2d 1376, 1385–86 (9th Cir. 1987), the court ruled that the Corps's failure to carry out a mitigation measure prescribed by the U.S. Fish and Wildlife Service resulted in the Corps violating section 7(a)(2).

521. See *American Rivers v. National Marine Fisheries Serv.*, No. 97-36159, slip op. at 7–8 (9th Cir. Mar. 8, 1999) (mem.) (“The [Corps] has been unable to secure mitigation because Congress has expressed doubts about the efficiency of the drawdown and has frozen funding pending further studies. Thus the failure to draw down the reservoir does not violate [the ESA]. Indeed, the [Corps] would arguably violate the express terms of [the BiOp and the statute] if it proceeded with the drawdown in the absence of required mitigation.”). The court also rejected the environmentalists' request for a reinitiation of consultation if the drawdown did not occur, ruling that the relevant ESA regulation (50 C.F.R. § 402.16(c) (1998)) requires reinitiation of consultation only when an action is substantially modified in a manner not considered by the BiOp. The court determined that the 1995 BiOp “clearly contemplated operation of John Day at greater than [minimum operating pool] for an indeterminate period before the necessary mitigation could be secured.” *Id.* at 8.

522. See *supra* note 517 and accompanying text.

523. See *Return to the River I*, *supra* note 281, at 268–69, 513 (calling for drawdowns of mainstem reservoirs, like John Day and McNary, to restore alluvial reaches for mainstem spawning), *discussed in* Blumm et al., *Beyond Parity*, *supra* note 221, at 114–15.

524. 16 U.S.C. § 1536(a)(2) (1994).

525. Like NMFS, the Northwest Power Planning Council must make decisions based on the best available science. See 16 U.S.C. § 839b(h)(6)(B) (1994).

fixes like hatcheries and barge and truck transport.⁵²⁶ Some months before completion of this report, NMFS and the Council signed an interagency agreement consolidating their scientific advisory panels into an Independent Scientific Advisory Board to advise both agencies.⁵²⁷ The board presumably will have an influence on NMFS's revised BiOp on Columbia Basin hydroelectric operations, especially the critical decision due in late 1999 of whether to continue barge and truck transport.⁵²⁸

NMFS's existing BiOp on hydroelectric operations established a scientific process, the Plan for Analyzing and Testing Hypotheses (PATH), specifically designed to help the agency make its impending 1999 decision.⁵²⁹ In 1998, the PATH scientists produced several reports indicating that from a scientific perspective, the best chance of restoring Columbia Basin salmon lies in a "natural river option" of breaching dams and eliminating the current transportation program.⁵³⁰ For example, the PATH scientists estimated that the natural river option would produce a nearly 100% probability of recovering Snake River chinook, while the existing transportation program would actually decrease the chances of recovery.⁵³¹ Whether these scientific judgments will prove decisive remains to be seen, but the PATH process has undoubtedly improved the quality of science available to NMFS.

M. The Myth That the ESA Is Economically Insensitive

A widespread complaint about the ESA is that the statute emphasizes species protection to the exclusion of economic considerations.⁵³² The decisions studied in this Article seriously question the accuracy of those

526. See Blumm et al., *Beyond Parity*, *supra* note 221, at 112–17; see also Volkman, *supra* note 219, at 64–65.

527. See National Marine Fisheries Serv. & Northwest Power Planning Council, *Agreement Regarding the Independent Scientific Advisory Board* (1996).

528. See *supra* notes 263–64, 272, and accompanying text.

529. See *1995 BiOp*, *supra* note 249, at 6. The PATH scientists are specifically concerned with advising NMFS on the science that will support its revised BiOp on hydroelectric operations, and their studies are subject to peer review. The Independent Scientific Advisory Board has a broader mandate, to advise NMFS and the Northwest Power Planning Council, see *supra* note 525 and accompanying text, on all aspects of salmon restoration efforts, and its studies are not peer reviewed. There is apparently no overlap in the membership of the two scientific advisory bodies. Conversation between Greg Corbin and Daniel Rohlf, in Portland, Or. (Apr. 2, 1999).

530. See Blumm et al., *The Case for Dam Breaching*, *supra* note 272, at 1016, 1018–23.

531. See *id.* at 1013–20 (discussing *PATH Report*, *supra* note 277, at 24).

532. See *supra* note 220 and accompanying text.

allegations. For example, in the numerous eleventh-hour compromises that NMFS made in formulating the 1995–99 BiOp on hydroelectric operations, none favored salmon.⁵³³ In its concurrence to the biological assessments on the Umpqua timber sales, NMFS approved the sales even though it admitted that the existing state of salmon habitat in the area was unsatisfactory, and the timber harvests would further degrade the area.⁵³⁴ These decisions cannot be explained on biological grounds. NMFS apparently believes that the ESA affords the agency sufficient flexibility to take into account the economic benefits of current Columbia Basin hydroelectric operations⁵³⁵ or the nine timber sales at issue in the Umpqua Basin. As Congress considers the advisability of amending the ESA, it should carefully evaluate the statute's demonstrated flexibility to accommodate economic concerns, which these case studies reveal.

V. CONCLUSION

The advent of the ESA era in salmon restoration has forever changed both the implementation of the statute and land and water use decisionmaking in the Northwest. Whether the new era has actually produced changes that will benefit salmon runs is far less certain.

The salmon's legacies to ESA implementation are numerous. First, to manage the listing process, NMFS invented the ESU concept, which limited the salmon populations eligible for listing to those considered evolutionarily significant.⁵³⁶ Not only does the ESU concept arguably emphasize genetics at the expense of ecological considerations,⁵³⁷ but NMFS's decision to adopt the policy created some inconsistency with FWS, whose interpretation of "distinct population segments" is not dominated by genetic considerations.⁵³⁸

A second change to the implementation of the ESA as a result of the salmon listings was NMFS's adoption of "streamlining" to speed up the

533. See *supra* notes 249–60 and accompanying text.

534. See *supra* notes 426–30 and accompanying text.

535. There is, however, some question of just how costly it would be to change current Columbia Basin hydroelectric operations to allow for the breaching of lower Snake River dams. See Blumm et al., *The Case for Dam Breaching*, *supra* note 272, at 1023–31 (discussing various cost estimates of dam breaching, two of which concluded that there would be net economic benefit if lower Snake River dams were removed, and none of which concluded that dam breaching was economically infeasible).

536. See *supra* notes 43–50 and accompanying text.

537. See *supra* notes 45–48 and accompanying text.

538. See *supra* note 181.

process of consultation.⁵³⁹ The result of “streamlining,” which is unlikely to be confined to Northwest salmon, was that about three-quarters of the ESA consultations subject to streamlining culminated not with a NMFS BiOp, but with a NMFS summary concurrence approving mitigation measures contained in an action agency’s biological assessment.⁵⁴⁰ Certainly there is a benefit to expedited procedures, but the net effect of streamlining may be to emphasize NMFS’s off-the-record negotiations with action agencies in improving their assessments, instead of its biological expertise as reflected in written BiOps. This reduction in publicly accessible records offers insufficient assurance that biological considerations will predominate in ESA consultation.

A third salmon legacy to ESA implementation concerns the use of multi-year BiOps, first initiated in the context of Columbia Basin hydroelectric operations.⁵⁴¹ The institution of these long-term plans raises the stakes in section 7 consultations by adding a significant temporal dimension for ongoing activities. The resulting attention devoted to the multi-year BiOp on hydroelectric operations encouraged NMFS to make numerous compromises protecting economic concerns at the expense of salmon.⁵⁴² Although these compromises arguably were inconsistent with the intent of the ESA,⁵⁴³ courts have refused to reverse the compromises that NMFS struck.⁵⁴⁴

A fourth legacy of the salmon listings to ESA implementation involves the use of the consultation process to enforce pre-existing ecosystem management plans like the Northwest Forest Plan.⁵⁴⁵ These plans can include multi-year BiOps, as evident from the Inland Land case.⁵⁴⁶ Perhaps more significantly, NMFS appears to have employed consultation to implement measures contained in its proposed (but never completed) Columbia Basin salmon recovery plan.⁵⁴⁷ If implementing ecosystem plans through section 7 consultation becomes commonplace, it is important that the plans themselves be subject to consultation, as required by the Ninth

539. *See supra* notes 396–401 and accompanying text.

540. *See supra* notes 400–01 and accompanying text.

541. *See supra* text accompanying and preceding note 236.

542. *See supra* notes 240–60 and accompanying text.

543. *See supra* notes 235, 238, and accompanying text.

544. *See supra* notes 267–73, 509, 521, and accompanying text.

545. *See supra* notes 424–25, 428, and accompanying text.

546. *See supra* notes 441, 460, and accompanying text.

547. *See supra* notes 303, 306, 321, 348–50, 357, and accompanying text.

Circuit in the *Pacific Rivers Council* decision.⁵⁴⁸ It is even more important that they be specific enough to serve as a guide for subsequent actions.

A fifth contribution to ESA implementation from salmon restoration concerns the definition of “best available” science. Judge Marsh refused to accept NMFS’s interpretation of that statutory mandate where the agency had ignored the views of state and tribal biologists.⁵⁴⁹ This indicates that the ESA demands a pluralistic process of intergovernmental consultation in arriving at best available science. NMFS appears to agree, establishing a process designed to produce independent scientific review of its actions.⁵⁵⁰ Whether NMFS will accept the recommendations of independent scientists on tough issues like whether to breach the Lower Snake River dams is not yet clear,⁵⁵¹ but the process of obtaining independent scientific review now seems well established.

If the salmon’s effects on the ESA have been many and varied, the ESA’s contribution to salmon restoration has been less certain. There is no question that the ESA listings have produced a massive amount of process, albeit some of it now “streamlined.”⁵⁵² Even more process may be on the way, with suggestions that NMFS will soon undertake a “mega-BiOp” in which Columbia Basin hydroelectric operations, hatchery operations, harvest, and habitat management all would be considered in the same document.⁵⁵³ However, all this process has yet to produce significant improvement in Columbia Basin salmon runs: although there are some indications that the juvenile salmon survival is increasing,⁵⁵⁴ there is as yet no increase in adult spawners, the key to salmon recovery.

Part of the problem with the lack of substantive results is that despite all the process, some damaging activities have escaped biological review. For example, hydroelectric operations under existing FERC licenses would seem to be an ongoing federal action requiring section 7 consultation,⁵⁵⁵ as would Bureau of Reclamation water deliveries under existing contracts.⁵⁵⁶

548. See *supra* notes 406–13 and accompanying text.

549. See *supra* note 234 and accompanying text.

550. See *supra* notes 275–76 and accompanying text.

551. See *supra* notes 277–79 and accompanying text.

552. See *supra* notes 396–401, 539–40, and accompanying text.

553. See Barry Espenson, *Federal Agencies Point Toward New BiOp*, 33 *Columbia Basin Bull.* 1 (Feb. 26, 1999) <www.nwppc.org/bulletin/bull_33.htm>.

554. See Barry Espenson, *NMFS Studies Show Smolt Survival Gains*, 28 *Columbia Basin Bull.* 1 (Jan. 15, 1999) <http://www.nwppc.org/bulletin/bull_28.htm>.

555. See *supra* notes 480–84 and accompanying text.

556. See *supra* notes 485–89.

Yet neither type of activity has been subjected to consultation, and it may be necessary once again that citizens ask courts to order the agencies to fulfill their ESA duties.⁵⁵⁷

The largest impending substantive decision is NMFS's decision on whether to continue artificially transporting juvenile salmon by truck and barge, or to recommend breaching the four Lower Snake River dams to let the fish migrate in the river.⁵⁵⁸ This determination, expected in late 1999, may be the best indication of whether the ESA offers listed salmon anything more than elaborate process and economically sensitive decisionmaking. Although strong evidence exists that dam breaching is both the best means to recover listed Columbia Basin salmon and economically affordable,⁵⁵⁹ there are early indications that NMFS will seek to avoid the political controversy that would surround dam breaching and will continue barging and trucking salmon. Equipped with judicial approval of its BiOp, promising just a fifty percent chance of recovering listed salmon,⁵⁶⁰ and about to prepare a "mega BiOp" that could shift some of the focus away from hydropower to other sources of salmon mortality,⁵⁶¹ NMFS appears to have sufficient discretion to continue artificially transporting salmon downstream. As a result, NMFS is unlikely to change materially the way the Columbia and Snake Rivers flow, despite the failure of the trucking and barging program to produce discernable improvements in salmon returns over more than two decades.⁵⁶²

Perhaps the chief lesson from this study is that the ESA affords NMFS sufficient authority to resolve scientific uncertainties in a way that allows the pursuit of the politically palatable, instead of the biologically necessary.

VI. EPILOGUE

While this Article was being prepared for publication, NMFS released a document that may signal the nature of the debate over the key decision concerning the future of Columbia Basin salmon—the decision whether to

557. See *supra* note 490 and accompanying text.

558. See *supra* notes 263–64, 277–79, 528, 530–31, and accompanying text.

559. See Blumm et al., *The Case for Dam Breaching*, *supra* note 272; Barry Espenson, *A-Fish Appendix Will Answer Scientists*, 37 Columbia Basin Bull. 1 (Apr. 2, 1999) <http://www.nwppc.org/bulletin/bull_37.htm> (discussing March 22, 1999, letter signed by 200 scientists urging President Clinton to support breaching of lower Snake River dams and return to "normative" river conditions).

560. See *supra* notes 255, 267, 273, and accompanying text.

561. See *supra* note 479 and accompanying text.

562. See Blumm et al., *The Case for Dam Breaching*, *supra* note 272, at 1014, 1017–23.

breach the four lower Snake River dams or to continue barging and trucking juvenile salmon around the dams.⁵⁶³ This April 14, 1999, study reiterates what other scientific studies have concluded: that breaching the dams offers the best chance of restoring the imperiled Snake River salmon runs.⁵⁶⁴ However, while breaching is, in the words of the report, the “most risk-averse” alternative to restoring the salmon runs, the scientists stressed that if certain assumptions changed, breaching might provide only “negligible benefits” compared to leaving the dams intact and continuing with barging and trucking salmon.⁵⁶⁵ These assumptions concerned what the report referred to as “differential delayed transportation mortality,” which is delayed mortality due to adverse effects of barging and trucking.⁵⁶⁶ The report suggested that if the differential delayed mortality is assumed to be low, the advantages of breaching are not so pronounced, and inferred that uncertainties over the effects of transportation could be narrowed by a five-to ten-year study. Even with such a study, however, the “answer still will not be certain, and there is some risk that if the data reveal transportation mortality is in fact substantial, the species [will] suffer an enhanced risk of not meeting the survival criterion.”⁵⁶⁷ The report estimated that the overall increased risk of extinction would be approximately eight percent, although actual risks to localized stocks are likely to be higher, given their desperate condition.⁵⁶⁸

Reaction to the report was predictable: politicians who have already declared their opposition to dam breaching, like Senators Gorton (R-Wash.) and Smith (R-Or.), quickly pointed to the need for more study before

563. See *supra* notes 263–64, 272, 495, 528, and accompanying text. See generally Blumm et al., *The Case for Dam Breaching*, *supra* note 272.

564. See Barry Espenson, *A-Fish Report Stresses Uncertainties*, 39 Columbia Basin Bull. 1 (April 16, 1999) <http://www.nwppc.org/bulletin/bull_39.htm>, for a discussion of a NMFS study entitled *An Assessment of Lower Snake River Hydrosystem Alternatives on Survival and Recovery of Snake River Salmonids*. The study, which will become the anadromous fish appendix in a Corps of Engineers environmental impact statement on the effects of breaching the dams, was produced by scientists at NMFS’s Northwest Fisheries Science Center in Seattle. See *id.*

565. *Id.*

566. *Id.* Scientists assume that one reason that few adult salmon return to spawn, despite the high percentage of juvenile salmon that survive trucking and barging, is that the physiological stress associated with the experience of being artificially transported (due to collection and crowding in barges and trucks) produces delayed mortalities. Scientists also assume that delayed mortalities occur due to the transportation program’s genetic selectivity, its disruption in salmon homing capabilities, and its fostering of disease transmission. See Blumm et al., *The Case for Dam Breaching*, *supra* note 272, at 1009–10 & n.58.

567. Espenson, *supra* note 564 (quoting report’s executive summary).

568. See *id.*

breaching; environmentalists feared the report would lead to more “paralysis by analysis.”⁵⁶⁹ As the NMFS Regional Administrator has recently written, the idea that the region seeks a science-based approach to salmon recovery is a myth; people in fact practice “pick-and-choose . . . agenda-driven science advocacy” to bolster policies they favor.⁵⁷⁰ The policy agenda that this report favors is maintenance of the status quo: more study of the reasons why the twenty-year-old experiment of barging and trucking of Columbia Basin salmon is failing to prevent the species’ slide toward extinction. Perhaps that agenda helps to explain why state and tribal biologists were apparently excluded from drafting the report.⁵⁷¹ Further, the PATH scientific group, which NMFS created to advise the agency on its decision of whether to continue trucking or barging or to recommend dam breaching, never raised the issue of differential delayed mortality in any of their studies.⁵⁷² It is more than a little curious that NMFS would discover this new reason to continue to study the two-decades-old experiment of artificially transporting salmon just as the study time period under its existing BiOp is about to expire, and when virtually all the science suggests that the best course of action to save the Snake River runs is dam breaching.⁵⁷³ Perhaps NMFS is practicing its own form of “agenda-driven” science.⁵⁷⁴

Coupled with the deferential review the courts are giving NMFS decisionmaking and NMFS’s efforts to produce a “mega-BiOp” that may de-emphasize the effect of hydroelectric operations,⁵⁷⁵ the new report may give NMFS all the scientific “cover” the agency needs to continue “business as usual” under the ESA. That is hardly good news for the endangered Snake River salmon, which may become the first ESA-protected species to be studied to death.

569. See Barry Espenson, *A-Fish Report Gets Mixed Reaction*, 39 Columbia Basin Bull. 2 (Apr. 16, 1999) <http://www.nwppc.org/bulletin/bull_39.htm>.

570. William Stelle, Jr., *Overcoming the Seven Myths of Columbia River Salmon Recovery*, 28 *Envtl. L.* 493, 499 (1998).

571. See Espenson, *supra* note 569 (quoting Ed Bowles, Idaho Department of Fish and Game’s Anadromous Fish Manager, who complained of “closed process”; and Earl Weber, Columbia River Inter-Tribal Fish Commission fisheries scientist, who noted that “[t]he states and tribal [scientists] were not allowed to see the document, let alone comment on it”).

572. See Blumm et al., *The Case for Dam Breaching*, *supra* note 272, at 1020–23.

573. See *id.* at 1012–23.

574. See *supra* note 570 and accompanying text.

575. See *supra* notes 267, 273, 509, 521 (deferential judicial review), 479 (“mega-BiOp”), and accompanying text.